Environmental Assessment
Carlsbad Village Double Track Project

Issued by: Federal Railroad Administration (FRA)
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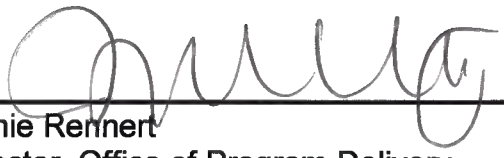

4/3/2018

Jamie Rennert
Director, Office of Program Delivery
Federal Railroad Administration

Date

Environmental Assessment

for the

Carlsbad Village Double Track Project



Prepared for

U.S. Department of Transportation
Federal Railroad Administration

SANDAG

Prepared by
BRG Consulting, Inc.

B R G

April 2018

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for the

Carlsbad Village Double Track Project

prepared for

Federal Railroad Administration (FRA)

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June 2014

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September 2013

C. Biological Technical Report
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February 2016

D. Community Impact Assessment
Prepared by BRG Consulting, Inc.
June 2014

E Environmental Justice Technical Report
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June 2014

F Cultural and Historical Resources Report
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August 2013

G1 Preliminary Foundation Report for the Carlsbad Village Station Pedestrian Underpass
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February 2014

G2 Preliminary Foundation Report for the Buena Vista Lagoon Bridge
Prepared by Earth Mechanics, Inc.
February 2014

H Phase I Environmental Site Assessment
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August 2013

I1 Preliminary Drainage Report
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March 2014

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February 2014

J Land Use Technical Report
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June 2014

K Noise and Vibration Impact Assessment
Prepared by ATS Consulting
June 2014

L Section 4(f) Evaluation
Prepared by BRG Consulting, Inc.
June 2014

M Utility Impacts Report
Prepared by T.Y. Lin International
March 2014

N Preliminary Storm Water Management Plan
Prepared by T.Y. Lin International
March 2014

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ACRONYMS

°F	Degrees Fahrenheit
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Materials
AMSL	Above Mean Sea Level
APCD	Air Pollution Control District County of San Diego
APE	Area of Potential Effect
A_R	Base Acceleration Coefficient
AREMA	American Railway Engineering and Maintenance-of-way Association
ARS	Acceleration Response Spectral
ASTM	American Society for Testing and Materials
BA	Biological Assessment
BMP	Best Management Practice
BO	Biological Opinion
BSA	Biological Study Area
CAA	Clean Air Act
CAGN	California gnatcatcher
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCA	California Coastal Act
CCAA	California Clean Air Act
CCC	California Coastal Commission
CCMP	California Coastal Management Program
CCR	Code of California Regulations
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQ	California Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CAGN	California Gnatcatcher
CH_4	Methane
CIDH	Cast-In-Drilled-Hole

CMWD	Carlsbad Municipal Water District
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide equivalent
CP	Control Point
CPT	Cone Penetration Test
CT	California Test
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
dBA	A-Weighted Decibels
DMC	De Minimis Condition
DOT	Department of Transportation
DPM	Diesel Particulate Matter
EA	Environmental Assessment
EHRA	Earthquake Hazards Reduction Act
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Endangered Species Act (Federal)
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, & Rodenticide Act
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GHG	Greenhouse Gas
HA	Hydrologic Area
HCFC	Hydrochlorofluorocarbons
HDPE	High Density Polyethylene
HFC	Hydrofluorocarbons
HMP	Habitat Management Plan
HMTA	Hazardous Materials Transportation Act
HP	High Pressure
HRS	Hazard Ranking System
HU	Hydrologic Unit
I-5	Interstate 5
ICCTA	Interstate Commerce Commission Termination Act
Lbs	pounds

LCP	Local Coastal Program
L_{dn}	Day-Night Sound Level
L_{eq}	Equivalent Sound Level
LHP	Landslide Hazard Program
LID	Low Impact Development
Lmax	Maximum noise level
LOSSAN	San Diego-Los Angeles-San Luis Obispo Rail Corridor
LQG	Large Quantity Generator
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MBTA	Migratory Bird Treaty Act
MFR	Multi-Family Residence
MHCP	Multiple Habitat Conservation Plan
MOU	Memorandum of Understanding
MP	Mile Post
mph	miles per hour
MS4	Municipal Separate Storm Sewer System
MT	mainline track
$MTCO_2e$	Metric Tons of Carbon Dioxide Equivalent
MTS	Metropolitan Transit District
MWD	Metropolitan Water District
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCC	North Coast Corridor
NCCP	Natural Community Conservation Planning
NCTD	North County Transit District
NCTC	North County Transit Corridor
NEHRP	National Earthquake Hazards Reduction Program
NEPA	National Environmental Policy Act
NERRS	National Estuarine Research Reserve System
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NO_x	Nitric Oxide and Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSF	National Science Foundation
N_2O	Nitrous Oxide
O_3	Ozone
OCRM	Ocean and Coastal Resource Management
OHWM	Ordinary High Water Mark

PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PCB	Polychlorinated Biphenyls
pcf	Pound Per Cubic Foot
PDP	Priority Development Project
PEIR	Programmatic Environmental Impact Report
PEIS	Programmatic Environmental Impact Statement
PFC	Perfluorocarbons
PIP	Public Involvement Plan
PM_{10}	Particulate matter less than 10 microns
$PM_{2.5}$	Particulate matter equal to or less than 2.5 microns
ppm	parts per million
PPP	Public Participation Plan
PPV	Peak Particle Velocity
psf	Pound Per Square Foot
PWP/TREP	Public Works Plan/Transportation and Resource Enhancement Program
RAP	Relocation Assistance Program
RAQS	Regional Air Quality Standards
RCP	Reinforced Concrete Pipe
RCP	Regional Comprehensive Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
ROW	Right-of-way
RPW	Relatively Permanent Water
RSA	Resource Study Area
RT	Residential Tourist
RWQCB	Regional Water Quality Control Board
S	Site Coefficient
SANDAG	San Diego Association of Governments
SARA	Superfund Amendments & Reauthorization Act
SB	Senate Bill
SCIC	South Coastal Information Center
SDAB	San Diego Air Basin
SDG&E	San Diego Gas and Electric
SDWA	Safe Drinking Water Act
SF_6	Sulfur hexafluoride
SFR	Single-Family Residential
SHCP	Subarea Habitat Conservation Plan
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPT	Standard Penetration Test

SQG	Small Quantity Generator
STB	Surface Transportation Board
SUSMP	Standard Urban Stormwater Management Plan
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TC	Transportation Corridor
TPH-g	Total Petroleum Hydrocarbons as gasoline
TSA	Transportation Security Administration
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VCP	Vitrified Clay Pipe
VdB	Vibration Decibels
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WoUS	Waters of the United States
µg/m³	Microgram per cubic meter

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1.0 PURPOSE AND NEED OF PROJECT

1.1 Introduction

This Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) NEPA implementing regulations, and the Federal Railroad Administration's (FRA) Procedures for Considering Environmental Impacts (FRA Procedures). This is a Tier 2 EA, addressing site-specific environmental impacts associated with the San Diego Association of Governments' (SANDAG) proposed construction and operation of the Carlsbad Village Double Track Project. The concept of tiering allows an agency to make planning decisions and decision-making in NEPA from broader scope during a Tier 1 review and follow up with project or site specific reviews and decision making during Tier 2.

This EA tiers from the 2007 Tier 1 Los Angeles-San Diego-San Luis Obispo Rail Corridor (LOSSAN) Programmatic Environmental Impact Report (PEIR)/Programmatic Environmental Impact Statement (PEIS) and subsequent FRA Record of Decision. For the Tier 1, FRA served as the lead Federal Agency for NEPA while the California Department of Transportation (Caltrans), Division of Rail served as the lead State Agency for purposes of California Environmental Quality Act (CEQA). The FRA continues to be the lead agency during Tier 2 because the FRA is providing financial assistance for the completion of preliminary engineering and environmental review for the Carlsbad Village Double Track Project. At this time, FRA has no other funding or approvals related to construction or implementation of the Project.

SANDAG proposes the addition of a second main track along the Oceanside to Carlsbad segment of the LOSSAN Rail Corridor. The Carlsbad Village Double Track Project, or Proposed Action, is located within the existing North County Transit District (NCTD) railroad right-of-way (ROW) along the LOSSAN Rail Corridor. As of April 2013, NCTD's Coaster trains and AMTRAK Pacific Surfliner trains stop at Carlsbad Village Station.

1.2 Project Background

The LOSSAN Rail Corridor in San Diego County serves both intra- and interstate commerce (freight), as well as national passenger rail (Amtrak) and regional commuter service (Coaster and Metrolink). The portion of the LOSSAN Rail Corridor within San Diego County is the San Diego Subdivision of the North County Transit Corridor (NCTC). On the San Diego Subdivision, NCTD is the owner/operator for the segment between the Orange County line and the San Diego city limits. Implementation of most of NCTD's capital projects, including Carlsbad Village Double Track, transitioned to SANDAG pursuant to Senate Bill (SB) 1703 (2002), legislation that clarified the role of SANDAG as the implementing agency for capital projects and that of NCTD as a transit operator.

1.2.1 Previous Environmental Documents and Studies

Several previous environmental documents and studies laid the groundwork for the current project. These documents and studies established the regional context for meeting regional transportation demands, programmatically identified likely environmental effects and mitigation strategies, established the need for double track through the project area, and established a range of alternatives to be reviewed in this EA.

Los Angeles – San Diego (LOSSAN) State Rail Corridor Study (WSA, 1987). A 1987 LOSSAN State Rail Corridor Study identified and prioritized improvements along the LOSSAN rail corridor that would reduce train running times, increase reliability of service, facilitate additional frequencies for inter-city service, and provide for the introduction of commuter rail service while maintaining capacity for freight operations. The projects detailed in the study were intended to further the state and region-wide goal of reducing dependence on single-occupant vehicles. The study identified improvements to the Carlsbad Village Double Track as a priority project essential to reliability of rail service. Realignment of the track and adding a second mainline track (MT) in Carlsbad Village was identified in this study as a project that would contribute to reduced travel time, and enhanced operations in terms of reliability, efficiency and safety.

LOSSAN PEIR/PEIS (FRA, Record of Decision March 19, 2009). FRA served as the lead Federal Agency for NEPA while the Caltrans, Division of Rail served as the lead State Agency for purposes of CEQA. The Carlsbad Village Double Track project was part of the rail improvements evaluated in this document. The PEIR/PEIS was a Tier 1 environmental review document that evaluated conceptual corridors, alignments, and station options. The PEIR/PEIS described how the improvements would serve the purpose of augmenting the existing rail infrastructure; help relieve congestion and capacity constraints, while offering reliable, safe and time-efficient travel. The PEIR/PEIS identified the subsequent to the joint PEIR/PEIS tiered environmental reviews would be prepared for a project-level environmental review prior to permitting and construction. The Tier 2 environmental document would provide further consideration of site specific alignments including depth analysis, engineering refinement, and detailed studies, as well as further public and agency input to avoid or minimize impacts and to make decisions among alignment options.

Final Environmental Impact Report for the Oceanside-San Diego Commuter Rail Project (Kornblatt, 1989). This Environmental Impact Report (EIR) analyzed the purchase of ROW, the beginning of Coaster service, and the construction of additional improvements, including stations and track improvements. The EIR included an analysis of some double-tracking to be carried out within the existing ROW, including through Carlsbad Village that would not affect sensitive resources.

San Diego Forward: The Regional Plan (The Regional Plan) (SANDAG, 2015a). The Regional Plan is a comprehensive roadmap to guide San Diego from 2015 through 2050. It integrates the regional transportation planning, sustainable communities strategy, and the regional comprehensive planning into one document to chart the region's future growth and transportation investments. The vision of The Regional Plan is to provide innovative mobility choices and planning to support a sustainable and healthy region, a vibrant economy, and an outstanding quality of life for all. The Regional Plan seeks to guide the San Diego region toward a more sustainable future by integrating how to use land and plan transportation. It serves as a long-range plan designed to coordinate and manage future regional transportation improvements, services, and programs among the various agencies operating within the San Diego region. The Regional Plan outlines projects for rail and bus services, highways, local streets, bicycling, and walking, as well as systems and demand management. Proposed major improvements to meet these objectives include double-tracking the remaining single-tracked portions of the entire railroad line from Oceanside to San Diego, which includes the railroad through Carlsbad Village. The Regional Plan Final EIR (SANDAG, 2015b) identified potentially significant and unavoidable impacts, potentially significant and mitigable impacts as well as impacts identified as less than significant. Feasible mitigation measures are identified in the Final EIR.

LOSSAN Corridorwide Strategic Implementation Plan (LOSSAN Rail Corridor Agency, 2012). The LOSSAN Agency initiated the LOSSAN Corridorwide Strategic Implementation Plan as a first step in implementing a new corridorwide vision for passenger rail services. This vision was adopted by the LOSSAN Board of Directors in 2009 and calls for a fresh look at the future of the entire rail corridor with an emphasis on intercity rail service. The goals of the LOSSAN Corridorwide Strategic Implementation Plan study are: collectively provide the infrastructure to allow more peak period trains, faster through-express trains and additional service improvements that meet current and future conventional and high-speed intercity, commuter, and freight demands both north and south of Los Angeles Union Station; integrate regional fare policy and develop common fare media that are based in part on early implementation lessons in the corridor as appropriate (electronic revenue collection); integrate and/or coordinate operations and develop more efficient operating schedules and dispatching for corridor services; implement a strategy for seamless rail travel in the corridor; collaborate to identify and establish new services for unserved and underserved markets; integrate and improve traveler information, standardized to the extent possible; and, coordinate with long-distance passenger rail and connecting motorcoach services.

California State Rail Plan (Caltrans, 2013). In compliance with 49 United States Code (USC) Section 22102 concerning state rail plans and state rail administration, the California State Rail Plan establishes a statewide vision and objectives, sets priorities, and develops implementation strategies to enhance passenger and freight rail service in the public interest. The California State Rail Plan provides a comprehensive listing of long-range investment needs for California's passenger and freight infrastructure, it supports the State's goal of developing an integrated, multimodal transportation network it guides federal and state rail investments that will improve the movement of people and goods while enhancing economic growth and quality of life. The Proposed Action is identified as a capital project in the California State Rail Plan.

1.3 Study Area

The Proposed Action is located in the northwestern portion of San Diego County, California, within the Cities of Oceanside and Carlsbad along the Pacific Coastline, west of Interstate 5 (I-5), as shown in Figure 1-1. As shown in Figure 1-2, the Proposed Action involves double-tracking an existing railroad ROW between Mile Post (MP) 228.0 in Oceanside to MP 229.6. The Proposed Action would be implemented solely within the existing railroad ROW between Cassidy Street in Oceanside and Pine Avenue in Carlsbad, in addition to a new wayside signal located at MP 230.1 within the ROW 150 feet north of Tamarack Avenue, extending through downtown Carlsbad and Buena Vista Lagoon. The developed land surrounding the lagoon is comprised of single-family and multi-family residential, as well as commercial land uses to the east and west of the lagoon. The immediate area surrounding the lagoon is made up of densely vegetated open space. Additionally, the railroad ROW is slightly visible but very distant and views are mostly obstructed from Magee Park and the small park (Maxton Brown Park) located at the corner of State Street and Laguna Drive. The project site is located within the California Coastal Zone Boundary.

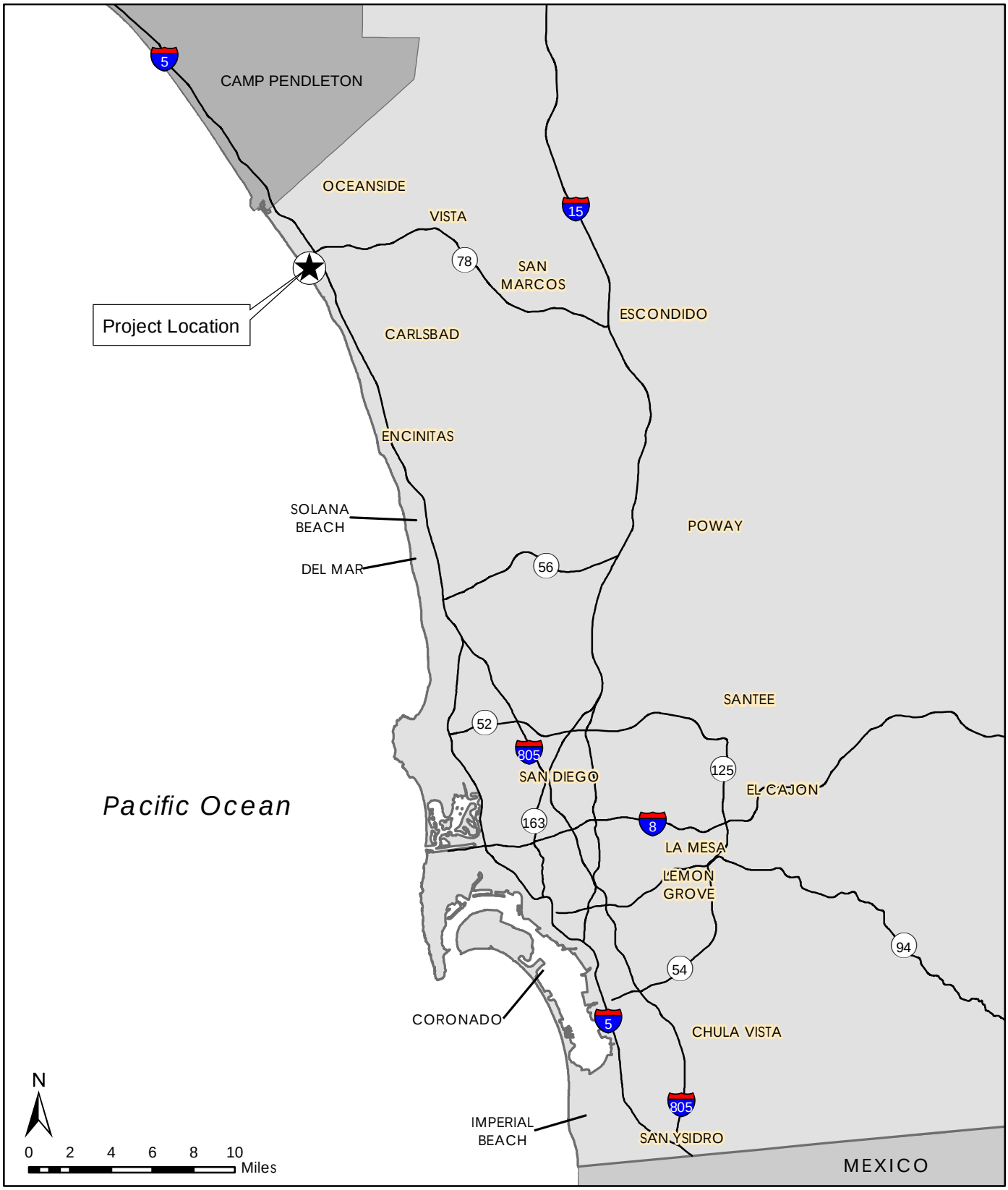
1.4 Project Purpose and Need

As discussed above in Section 1.2, a 1987 LOSSAN State Rail Corridor Study identified the realignment and double-tracking improvements to the Carlsbad Village Double Track as a priority project essential to reliability of rail service. Currently there are delays in scheduled operations, a lack of flexibility for freight operations and current capacity is not expected to meet future demands. Double-tracking the Oceanside to Carlsbad segment is needed to eliminate a single-

track bottleneck in the vicinity of Carlsbad Village Station. Constructing the 1.1-mile long second main track would connect the two adjacent double-track segments at each end of the project limits. This would achieve the project purpose of: improving operations for both passengers and freight in terms of reliability, efficiency and safety; improving commuter rail and intercity train service travel times; increasing flexibility for freight operations; and, providing capacity to meet future increased demand for all rail services in the LOSSAN Rail Corridor.

1.5 Applicable Federal Regulations and Permits

Federal permits that may be required to implement the Proposed Action that have been identified at this time include, but may not be limited to, a General Construction Permit for stormwater discharges (this is a Clean Water Act (CWA) Section 402 National Pollutant Discharge Elimination System (NPDES) permit obtained through filing a Notice of Intent and compiling a Stormwater Pollution Prevention Plan (SWPPP)). Other possible permit requirements include right-of-entry, encroachment and removal agreement, easement vacation, and/or construction permit from the City of Carlsbad and City of Oceanside. Further, permits for discharges of fill would need to be obtained from the United States Army Corps of Engineers (USACE) (CWA Section 404 Permit), and the Regional Water Quality Control Board (RWQCB) (CWA Section 401 Certification). State Historic Preservation Office (SHPO) Section 106 of the National Historic Preservation Act (NHPA) would be required. It may also be necessary to obtain incidental take permits for federally listed species from the United States Fish and Wildlife Service (USFWS) (Section 7 of the Endangered Species Act (ESA)). A federal Coastal Consistency Certification would also need to be made by the California Coastal Commission (CCC) (Coastal Zone Management Act (CZMA)). At this time, the Proposed Action is only funded through NEPA and engineering phases and not for construction.



SOURCE: SanGIS, 2016; BRG Consulting, Inc., 2016

9/12/16

Carlsbad Village Double Track EA

Regional Location

FIGURE 1-1

SOURCE: Esri, 2016; T.Y. Lin, 2013

9/12/16

Carlsbad Village Double Track EA

Project Location

FIGURE 1-2

2.0 ALTERNATIVES

2.1 Introduction

This section describes the alternatives analyzed within this EA. These alternatives were initially considered by SANDAG. In the 2011 *Project Study Report* (RailPros, 2011), RailPros recommended that the second track alignment be constructed to the east of the existing track maintaining 18 feet track centers through the station area, Grand Avenue, and Carlsbad Village Drive. SANDAG conducted an independent evaluation of potential alternative double track alignments in the Carlsbad Village Double Track area, *Alternatives Analysis Report for the Carlsbad Village Double-Track*, (T.Y.Lin, 2014a). The purpose of the alternatives analysis was to provide recommended alternatives to carry forward into preliminary engineering and environmental clearance that could potentially achieve the purposes of the rail improvements and avoid and/or minimize environmental impacts. Six alternatives and engineering designs were analyzed and evaluated. Alternatives were eliminated for reasons that are discussed in detail below (Section 2.3) and therefore, are not further evaluated in this EA.

The purpose of the Proposed Action is to add a second track to increase rail capacity and improve operations and reliability as established in Section 1.4. Six alternative project alignments and engineering designs were analyzed and evaluated in the Carlsbad Village Double Track Alternative Analysis Report (T.Y. Lin, 2014a). One alternative (Alternative B) was identified as the Proposed Action and is further evaluated in this EA. The No Action Alternative is also considered in this EA and is described in more detail below.

2.2 Criteria for Evaluating Alternatives

The alternative analysis was based upon criteria determined by SANDAG's Project Development Team. The Project Development Team included representatives from NCTD, SANDAG, RailPros, BRG Consulting, and T.Y. Lin International. Resource materials relied upon by the Project Development Team included: Project Study Report, preliminary environmental surveys, topographic surveys, record drawings, site investigations, existing bus routes, and known stakeholder concerns. The project team ranked each criterion and scored each alternative to determine a preferred alignment, which would have the least amount of impacts and greatest benefits generated with respect to selection criteria. The Project Development Team recommended one alternative, the Proposed Action, for analysis in the EA. The other design alternatives met the project's purpose and need (except the No Action alternative) but were dismissed for further consideration for other reasons as described in Section 2.4 Alternatives Dismissed.

2.3 Evaluated Alternatives

2.3.1 Proposed Action

2.3.1.1 Track Alignment

The Proposed Action would install a second main track within the existing railroad ROW between MP 228.0 and MP 229.6, as shown in Figure 1-2. The Proposed Action would relocate the existing MT alignment (MT2) 3 feet to the west of its existing location and add 1.1 miles of new second track (MT1) varying from 15 to 20 feet east of the existing track alignment. The Proposed Action includes the replacement of an existing single track bridge across Buena Vista Lagoon

with a double track bridge at a somewhat higher elevation to accommodate floods and anticipated sea level rise. Based on thirty percent design, it is anticipated that the new top of rail would be 5 feet higher than the current top of rail across the bridge. The new track would pass under the existing Carlsbad Boulevard Bridge through the existing east bay as shown in Figure 2-1.

The Proposed Action logically falls into two segments. The segment from the Carlsbad Boulevard Bridge to the northern end of the Study Area (MP 228.0) is hereinto referred to as the "Lagoon Segment". The segment south of the Carlsbad Boulevard Bridge is hereinto referred to as the "Developed Segment".

2.3.1.2 Lagoon Segment Improvements

Construction of a new pre-cast concrete double track bridge north of the Carlsbad Boulevard Bridge would include additional fill material to be placed on both sides of the existing embankment to widen the embankment width from approximately 65 feet to approximately 106 feet at the base of the berm. The wider embankment allows for the construction of the second track approximately 20 feet east of the existing tracks (centerline to centerline). The new bridge would be approximately the same length as the existing bridge. Construction of the bridge would be conducted in phases, beginning with the easterly MT1 track. The first phase of construction would include temporary shoring between the embankment and existing tracks to accommodate the up to five-foot rise in embankment elevation, placement and compaction of fill to widen and raise the berm, construction of half of the new bridge, laying of new track, and cutting over to allow the trains to run on the new track and bridge. Once the MT1 track is completed and operational, improvements to the MT2 track would be completed. This would include demolition of the existing bridge and track, placement and compaction of fill to widen and raise the berm, construction of the second half of the new bridge, laying of new track, and completing the track connections.

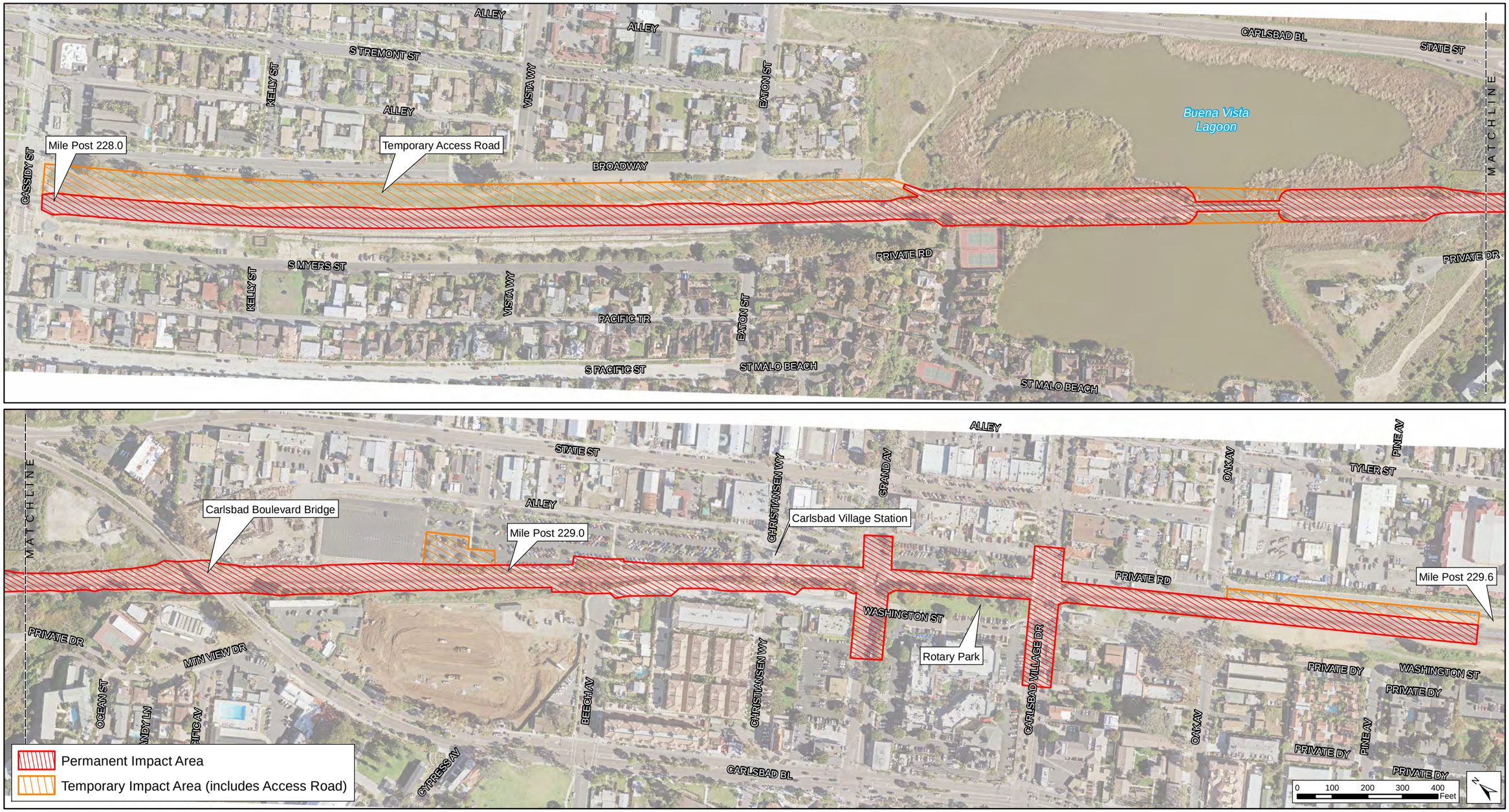
2.3.1.3 Developed Segment Improvements

South of Carlsbad Boulevard Bridge the new track improvements would gradually return to the existing elevation. The existing track (MT2) would be shifted 3 feet to the west and the new MT1 would be built 15 feet east of the existing track. The developed segment improvements include the following areas:

- Carlsbad Village Coaster Station Improvements
- Rotary Park Encroachment
- At-Grade-Crossings at Grand Avenue and Carlsbad Village Drive
- Tamarack Wayside Signal

Carlsbad Village Coaster Station Improvements

To accommodate a second track adjacent to Carlsbad Village Station, the existing track (MT2) would be shifted three feet to the west and provide an 18-foot offset to the new MT1 on the east (centerline to centerline). The existing width of the platform would be reduced by approximately 15 feet. This platform reduction would not adversely affect the Carlsbad Village Coaster Station building because the station was built anticipating that a 15-foot platform reduction would occur when a second track was installed. A new westerly platform would be installed, and a new inter-track fence would be installed between the two tracks. The existing at-grade pedestrian crossing would be eliminated and a new pedestrian undercrossing would be located within the railroad ROW north of the station building (in the vicinity of Beech



SOURCE: Esri, 2016; SanGIS, 2016; T.Y. Lin, 2013

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Project Impact Area

FIGURE 2-1

Avenue (MP 229.0)). The pedestrian undercrossing would allow for the eastern railway platform to connect with the western railway platform and provide public access east and west of the tracks, while allowing for trains to safely pass through the station while another train is loading/unloading at the station. The station parking lot would lose approximately 12 parking spaces. The existing six transit station bus bays would be reduced to three bus bays and two parallel parking stops, thus eliminating one bus bay.

Rotary Park Encroachments

Rotary Park was previously a City of Carlsbad public park located southwest of the existing railroad alignment between Grand Avenue and Carlsbad Village Drive. The former park is approximately one acre and lies entirely within the existing railroad ROW on land owned by NCTD. This former park is not included in the City of Carlsbad's recreational element of the General Plan. The property is no longer designated for recreational use. The Proposed Action would encroach three feet into the prior lease area and would require trimming of the existing trees and relocation of the existing fence. The Proposed Action would not affect the existing grass area within the prior lease area.

At-Grade-Crossings Grand Avenue and Carlsbad Village Drive

At-grade-crossing improvements would be required at Grand Avenue and Carlsbad Village Drive. The crossing gates, signals, and associated facilities for both directions of traffic at each crossing would need to be upgraded with the new facilities.

Tamarack Avenue Wayside Signal

Wayside signals would be installed at MP 230.09 to maintain block spacing and efficient train movement. The bidirectional signals would provide sufficient braking for eastbound and westbound trains while maximizing signal preview. Wayside signals would be installed approximately 150 feet north of Tamarack Avenue MP 230.1. Wayside signals would be placed 15 feet from centerline of existing main tracks. A new 8 X 10-foot signal shelter would be placed adjacent to existing crossing shelter. Figures 1-2 and 2-2 depict the location of the proposed Tamarack wayside signal.

2.3.1.4 Temporary Access Roads

Temporary access roads are necessary to provide ingress and egress to the site for construction purposes as shown on Figure 2-1. Beginning at the northern portion of the project, contractors would utilize the existing access road off Cassidy Street in Oceanside. Temporary access to the south side of the lagoon bridge would be through the NCTD yard located north of the station and along the proposed MT1 track. To access the southern end of the ROW in the Developed Segment of the site, contractors would utilize the access road off of Oak Avenue in the City of Carlsbad.

2.3.1.5 Maintenance Road

A permanent 11-foot wide maintenance road would be located east of the tracks from Control Point (CP) Longboard (MP 228.4) through the Lagoon Segment of the Proposed Action. The maintenance road would terminate at the lagoon bridge.

2.3.1.6 Drainage Best Management Practices

A bio-swale would be constructed along the north end of the east platform and the track and along the curb and sidewalk on the northeast side of the parking lot. The swales would provide treatment of runoff from the existing parking lot and platform area. The drainage ditches along the tracks would be re-graded to provide proper flow capacity and comply with NCTD standards, and riprap energy dissipaters would be constructed at the discharge points into the lagoon to mitigate 100-year storm velocities and prevent excessive erosion.

SOURCE: Esri, 2012; T.Y. Lin, 2013

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Tamarack Signal Work Area

FIGURE 2-2

2.3.1.7 Grading and Construction

Construction activities for the Proposed Action would last approximately 18 to 30 months (construction duration would vary depending upon weather and seasonal factors, and construction plan specifics developed during final design). Construction would involve the following general activities:

Phase 1

- Construct new pedestrian underpass at Carlsbad Village Station
- Construct West Platform at Carlsbad Village Station
- Construct new railroad embankment and easterly half of new Buena Vista Lagoon Bridge
- Construct new MT1 Track STA 2046 to 2095

Phase 2

- Lineover MT1 track into existing track between Carlsbad Boulevard Overpass and new bridge
- Move tracks 3 feet west at the station after the west platform is functional
- Remove existing Buena Vista Lagoon Bridge
- Construct 2nd half of new Buena Vista Lagoon Bridge

Phase 3

- Demolish existing platform at Carlsbad Village Station
- Finish construction at new east platform at Carlsbad Village Station
- Construct new MT1 track from STA 2095 to 2117

Phase 4

- Remove CP Carl (MP 229.5) and replace with track elements
- Connect new MT1 to existing MT1 at CP Carl
- Realign main tracks between Carlsbad Boulevard Overpass and new bridges to permanent alignment
- Remove CP Longboard and replace with track elements
- Restore and revegetate areas disturbed by construction
- Install Wayside Signals north of Tamarack Avenue

The proposed construction schedule would be Monday through Friday from 7:00 A.M. to 7:00 P.M. Weekend work and night work would also be required when work must be done near or on the existing track, and train traffic must be stopped for work to proceed. Limited nighttime construction would be necessary within the existing ROW where the existing track would be realigned and where new track would connect to the existing track. Construction access routes and staging areas would be provided along the length of the project.

2.3.2 No Action Alternative

Under No Action Alternative, the existing single railroad track alignment would not change, and a second track would not be developed. Under this alternative, rail operations and reliability would not be improved, and passenger and freight rail capacity would not be increased.

The No Action Alternative would avoid the environmental effects associated with implementation of the Proposed Action. However, unlike the Proposed Action, the No Action Alternative would not meet the project's purpose and need.

2.4 Alternatives Dismissed

As discussed above, an Alternative Analysis Report was prepared by SANDAG to identify project alternatives to carry forward for environmental review. The Proposed Action in the EA was identified as Alternative B in the Alternative Analysis Report. This section briefly describes the five alternatives (Alternative A, C, D, E, and F) considered in the Alternative Analysis Report but not carried forward for analysis in the EA. This section also describes the Trenching Alternative considered in the 2007 Tier 1 LOSSAN PEIR/PEIS.

2.4.1 Alternative A

Alternative A proposed to maintain the existing track as MT2 (west) and to construct a new MT1 (east) track with an offset to the east side of the existing tracks. Alternative A was eliminated from further review because a section of the existing Carlsbad Village Station building would need to be removed to provide adequate clearances. Approximately 17 parking stalls would be lost to improvements at the existing station under this alternative.

2.4.2 Alternative C

Alternative C proposed to offset the tracks at the station, similar to Alternative B. Along the Lagoon Segment, the existing tracks would be maintained as MT1 (east) and MT2 would be built 20 feet to the west of MT1. In offsetting the MT2 track to the west, the new alignment for MT2 would require the tracks to travel through the Carlsbad Boulevard Bridge under the west bay. The west bay was not previously configured to accommodate tracks. To be able to utilize the west bay would require grading of the existing slope, construction of retaining walls and improvement to the bridge pier. This alternative also required a 20-foot linear encroachment in Rotary Park, resulting in additional impacts to the existing bus station and affected an existing tennis court north and west of the lagoon. Alternative C was eliminated from further review because of the need for retaining walls and bridge piers, because of impacts to adjacent bus station, Rotary Park, and tennis court.

2.4.3 Alternative D

Alternative D proposed to push the tracks along the Lagoon Segment 30 feet east of the existing track along the Lagoon Segment and construct the new MT1 track along the Station east of the existing tracks. The alignment would utilize the east bay of Carlsbad Boulevard Bridge to run the new track alignment under the existing bridge. Alternative D was eliminated from further review because a section of the existing Carlsbad Village Station building would need to be removed to provide adequate clearances.

2.4.4 Alternative E

Alternative E proposed to offset MT2 to the west of the existing tracks for both Segments, aligning the second track with the existing double-track at CP Longboard. The new track alignment would require the tracks to travel through the westerly bay of the Carlsbad Village Bridge, requiring grading and retaining wall improvements to make the bay accessible to the new track alignment. The 18-foot offset of the track along the Station would place the portions of the proposed platform/underpass improvements outside of the NCTD ROW, thus requiring additional ROW. Alternative E was eliminated from further review because of property acquisition takes and concerns for community/stakeholder acceptance.

2.4.5 Alternative F

Alternative F proposed to utilize the existing station's configuration for future double-tracking within the Developed Segment and proposed to shift both tracks to the east within the Lagoon Segment. The alignment would have utilized the east bay for access through the Carlsbad Boulevard Bridge. The rail geometry requires two reverse curves and one broken-back curve on MT1 and two reverse curves and two broken-back curves on MT2. Therefore, the tracks would have too many curves back and forth, which would provide for a less comfortable ride for passengers and would create additional maintenance issues for the railroad. In addition, a section of the existing Carlsbad Village Station building would need to be removed to provide adequate clearances; therefore, Alternative F was eliminated from further review.

2.4.6 Trenching Alternative

Caltrans and the FRA considered trenching in the City of Carlsbad as part of the Tier 1 LOSSAN PEIR/PEIS (Record of Decision, March 2009). In a letter addressed to the California Coastal Commission on July 17, 2014, the City of Carlsbad provided comments on the draft North Coast Corridor Public Works Plan and Transportation and Resource Enhancement Program (PWP/TREP). The comment letter included a request that SANDAG evaluate both an at-grade railroad option and a trench alternative. The City of Carlsbad, in cooperation with SANDAG, initiated preparation of a Feasibility Study for the grade separation of the railroad tracks and construction of the second track (Carlsbad Village Double Track – Railroad Trench Alternative Economic Analysis and Feasibility Study, January 2017).

The Feasibility Study considered two trench alternatives that consisted of a Short Trench and Long Trench. The Short Trench Alternative, would construct the double track railroad lowered in a trench passing under new vehicular overpasses at Grand avenue, Carlsbad Village Drive, and Oak Avenue, with new pedestrian overpasses at Beech Ave/Carlsbad Village Stations and Chestnut Avenue. The Long Trench Alternative, would construct a railroad trench passing under new vehicular overpasses at Grand Avenue, Carlsbad Village Drive, Oak Avenue, Chestnut Avenue, and Tamarack Avenue, with a new pedestrian overpass at Beech Ave/Carlsbad Village Station. Both trench options would require replacement of Carlsbad Boulevard Overcrossing with a new bridge spanning the tracks.

The Proposed Action of at-grade double tracking would not preclude trenching in the future. SANDAG considers projects on a regional basis and prioritizes them in the San Diego Forward: The Regional Plan. Trenching through downtown Carlsbad is not consistent with The Regional Plan, as it was not identified as a high-priority project because of the associated high cost. The Railroad Trench Alternative Economic Analysis and Feasibility Study identified that the Short Trench would have an estimated cost of between $215 million and $235 million, while the Long Trench would have an estimated cost of between $320 million and $350 million. For Comparison, the Proposed Action is estimated

to cost approximately $53.6 million. SANDAG would continue to study the possibility of trenching in the future; however, the trenching alternative was eliminated from further review in this EA.

3.0 ENVIRONMENTAL RESOURCES, IMPACTS AND MITIGATION

3.1 Aesthetic and Scenic Resources

The information provided in this section is a summary of the information provided in the *Pacific Surfliner Carlsbad Village Double-Track Project Visual Impact Assessment*, prepared by BRG Consulting, Inc. (BRG, 2014a). The full Visual Impact Assessment contains a more detailed analysis of visual impacts and is provided as Appendix A of this EA.

3.1.1 Regulatory Setting

The process used in the visual impact study generally follows the guidelines outlined in the publication "Visual Impact Assessment for Highway Projects (Federal Highway Administration (FHWA), March 1981). The process determines the visual impacts of project alternatives by assessing the changes in visual resources resulting from each alternative, and then predicting viewer responses to those changes. Visual resource change is the sum of the change in visual character and change in visual quality. The viewer response to project changes is the sum of viewer exposure and viewer sensitivity to the project. The resulting level of visual impact is determined by combining the severity of visual resource change with the degree of viewer response. The visual impact conclusions are provided in qualitative format; however, the qualitative conclusions [i.e. low (1), moderate (2), moderate-high (3), and high (4)] are associated with quantitative analysis, as further discussed in Appendix A of this EA.

3.1.2 Affected Environment

3.1.2.1 Visual Setting

The Proposed Action location occupies portions of the existing railroad ROW within the cities of Carlsbad and Oceanside, including a bridge over the Buena Vista Lagoon between them. The area is a relatively flat coastal plain, with gentle slopes downhill toward the Lagoon. The Carlsbad portion of the project location to the south is surrounded by a mix of office, commercial, and multi-family residential development, in addition to the existing Carlsbad Village Station, whereas the Oceanside portion is surrounded by residential development exclusively. The Buena Vista Lagoon is an area of open water surrounded by marshland. A landscape unit is a portion of the regional landscape and can be thought of as an outdoor room that exhibits a distinct visual character. As further discussed in Appendix A of this EA, the project site has been evaluated as two landscape units, the "Lagoon Landscape Unit" and the "Carlsbad Village Landscape Unit."

Because it is not feasible to analyze all the views in which the Proposed Action would be seen, a number of Key Viewpoints were identified that most clearly represent the visual impacts of the project. Key Viewpoints also represent the primary viewer groups that would potentially be affected by the Proposed Action. Figure 3.1-1 shows the location and the viewing direction of each of the four Key Viewpoints selected for this analysis. The following are the four Key Viewpoints identified for the Proposed Action.

Key Viewpoint #1 looks southwest from the southernmost end of Broadway Street in a cul-de-sac. The view represents public views from Broadway Street. Since the view represents views from a cul-de-sac, the views from this key viewpoint represent public views from the street, the residential uses along the street, and potential recreational users of the undesignated trails within Buena Vista Lagoon. As shown in Figure 3.1-2, the view from Key Viewpoint #1 primarily consists of views of the railroad corridor and vegetation surrounding the lagoon. The foreground is marked with a white fence and a train signal house at CP Longboard to the southwest. The distant background to the south consists of the Carlsbad Boulevard Bridge over the railroad tracks and various residential units.

Key Viewpoint #2 looks southwest from the Carlsbad Boulevard Bridge over the Buena Vista Lagoon. As shown in Figure 3.1-3, the view is dominated by the lagoon and the existing railroad alignment. The view includes mature vegetation in the foreground and scattered residential development in the background.

Key Viewpoint #3 looks south towards the Carlsbad Village Station from the station platform. As shown in Figure 3.1-4, the view is of a completely developed landscape, featuring the NCTD parking lot to the east, the station to the southeast, and the railroad tracks and the Metropolitan Transit System (MTS) Bus Station to the west.

Key Viewpoint #4 looks south from the railroad ROW at the Grand Avenue street crossing. As shown in Figure 3.1-5, the view is of a completely developed landscape, featuring railroad crossings in the foreground, the historical train station to the east, the railroad tracks to the south, and Rotary Park, a parking lot, and commercial development to the southwest.

Sensitive Viewpoints. All of the Key Viewpoints are considered sensitive because they host substantial public views of the railroad ROW. However, none of the viewpoints are considered scenic vistas by the community. Since all four of the Key Viewpoints are visually sensitive, all four are analyzed below. Visual simulations from the viewpoints were prepared and are presented to assist in the analysis of impacts below.

3.1.2.2 Existing Visual Character

Based on the FHWA guidelines, “visual character” is descriptive and non-evaluative which means it is based on defined attributes that are neither good nor bad in themselves. Because visual resource qualities are subjective based upon viewer interpretation, a change in visual character cannot be described as having good or bad attributes until it is compared with the viewer response to that change. If there is a public preference for the established visual character of a regional landscape and a resistance to a project that would contrast that character, then changes in visual character can be evaluated.

Lagoon Landscape Unit

The general characteristics of the area include natural and man-made features with landforms, vegetation, access, and human structures. The lagoon is a fresh-water wetland area that includes habitat with native and non-native vegetation (generally low-growing) and endangered species, as further described in the Biological Technical Report (Appendix C). Although not visible from any significant public viewpoints within the landscape unit, the Pacific Ocean lies to the west of the landscape unit. Carlsbad Boulevard and Broadway Drive are the primary public viewing areas of the landscape unit. Other views with in the landscape unit are from the residential development surrounding the lagoon, which provide private and insensitive views. Overall, the area is considered somewhat rural and lacking development.

SOURCE: BRG Consulting, Inc., 2014a

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Viewpoint Locations

FIGURE 3.1-1

Viewpoint 1 (Existing)
East of tracks, looking south across Buena Vista Lagoon
from the south end of the Broadway Street cul-de-sac in Oceanside

Viewpoint 1 (Photosimulation)

SOURCE: BRG Consulting, Inc., 2014a

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Viewpoint 1

FIGURE
3.1-2

Viewpoint 2 (Existing)
East of tracks, looking south across Buena Vista Lagoon
from the Carlsbad Boulevard bridge

Viewpoint 2 (Photosimulation)

SOURCE: BRG Consulting, Inc., 2014a

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Viewpoint 2

FIGURE
3.1-3

Viewpoint 3 (Existing)
East of tracks, looking south
from Carlsbad Village Station

Viewpoint 3 (Photosimulation)

SOURCE: BRG Consulting, Inc., 2014a

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Viewpoint 3

FIGURE
3.1-4

Viewpoint 4 (Existing)
West of tracks, looking south toward Rotary Park
from Grand Avenue

Viewpoint 4 (Photosimulation)

SOURCE: BRG Consulting, Inc., 2014a

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Viewpoint 4

FIGURE
3.1-5

Carlsbad Village Landscape Unit

The general characteristics of this area include office, commercial, and residential development surrounding the railroad ROW. This development lines the railroad ROW on either side, so the railroad ROW is relatively obstructed from most public viewpoints within Carlsbad Village except for where the railroad ROW crosses at roadway intersections, Carlsbad Village Station and Rotary Park. Overall, the area is fully developed.

3.1.2.3 Existing Visual Quality

Based on the FHWA guidelines, "visual quality" is evaluated by identifying the vividness, intactness and unity present in the viewshed. The FHWA states that this method should correlate with public judgments of visual quality well enough to predict those judgments. This approach to evaluating visual quality can also help identify specific methods for mitigating specific adverse impacts that may occur as a result of a project.

The three criteria for evaluating visual quality can be defined as follows:

Vividness is the visual power or memorability of landscape components as they combine in distinctive visual patterns.

Intactness is the visual integrity of the natural and built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as in natural settings.

Unity is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the landscape.

Lagoon Landscape Unit

The general visual quality of the existing landscape unit is moderate-high (3.34) due to the lack of development within the lagoon and the small buffer between the lagoon and the residential development. The vividness of the landscape unit is high (4) due to the high memorability of the landscape. The intactness is moderate-high (3) due to the natural landscape's freedom from encroaching elements. The unity is moderate-high (3) due to the landscapes semi-cohesive compromise between the built environment and the natural environment.

Carlsbad Village Landscape Unit

The general visual quality of the existing landscape unit is moderate (2) due to the abundance of development and the lack of blight and extensive maintenance. The village type development provides a moderate (2) level of vividness to the viewer. The intactness is low (1) due to the extensive development of the area. The cohesive village physical environment provides for a moderate-high (3) unity within the landscape unit.

3.1.2.4 Existing Viewer Sensitivity

Viewer sensitivity is defined both as the viewers' concern for scenic quality and the viewers' response to change in the visual resources that make up the view. Local values and goals may confer visual significance on landscape components and areas that would otherwise appear unexceptional in a visual resource analysis. The City of Oceanside and the City of Carlsbad have provided goals and design guidelines that indicate the residents' values and expectations for their visual environment, as further detailed in Appendix A.

Lagoon Landscape Unit

The Buena Vista Lagoon is considered a visual resource according to the City of Oceanside and the City of Carlsbad General Plans and Local Coastal Programs. Since the Lagoon is considered to be a visual resource, the community is sensitive to the preservation of the Lagoon and its surrounding open space landscape. The existing railroad ROW is an existing use that extends through the Lagoon and has been accepted by the community as a long-term existing use. The views from the railroad alignment are considered to be sensitive and are preserved. According to the City of Carlsbad Circulation Element a corridor is considered a "theme corridor" if the corridor connects Carlsbad with adjacent municipalities and presents the City of Carlsbad to persons entering and passing through the community. Carlsbad Boulevard is considered a "theme corridor" because it connects the City of Carlsbad to the City of Oceanside and represents the City of Carlsbad for those entering or passing through the community; and therefore, the views from the corridor are preserved. The natural open space and undesignated recreation corridors or trails throughout the Lagoon Landscape Unit are also sensitive viewsheds that are preserved. The Buena Vista Lagoon possesses a high (4) visual sensitivity.

Carlsbad Village Landscape Unit

The Carlsbad Village Landscape Unit is comprised of a variety of development because it consists of residential and commercial structures, as well as the Tamarack State Beach. Although the area does not contain an extensive amount of open space within the developed area, the Village possesses a distinct character and urban aesthetic appeal that is preserved within the community. The beach area is included in the Carlsbad Village Landscape Unit but is not visible or aesthetically affected by the existing railroad operations. According to the City of Carlsbad Circulation Element, Carlsbad Village Drive is considered a "Community Scenic Corridor" that leads to the beach. Since this is a prime corridor of the community, the views from the corridor are preserved and shall maintain their existing character. The Carlsbad Village Landscape Unit possesses a moderate (2) viewer sensitivity.

3.1.2.5 Existing Viewer Exposure

Viewer exposure is typically assessed by measuring the number of viewers exposed to the resource change, type of viewer activity, duration of their view, the speed at which the viewer moves, and the position of the viewer. High viewer exposure heightens the importance of early consideration of design, art, and architecture and their roles in managing the visual resource impacts of a project. The Key Viewpoints represent views afforded to the viewer groups, as further discussed in Section 3.1.2.1.

Lagoon Landscape Unit

The Lagoon Landscape Unit is viewed by the train passengers, freeway/local roadway travelers along Broadway Drive and Carlsbad Boulevard, recreational users, and community residents. The overall viewer exposure level for the Lagoon Landscape Unit exposure level is the average from the above groups that are able to view the Lagoon Landscape Unit. The overall viewer exposure for the Lagoon Landscape Unit is moderate (2).

Carlsbad Village Landscape Unit

The Carlsbad Village Landscape Unit is viewed by the train passengers, freeway/local roadway travels along Grand Avenue and Carlsbad Village Drive, recreational users of Rotary Park, office/commercial workers, and community residents. The overall viewer exposure level for the Carlsbad Village Landscape Unit is the average from the above

groups that are able to view the Carlsbad Village Landscape Unit. The overall viewer exposure for the Carlsbad Village Landscape Unit is moderate-high (3).

3.1.3 Environmental Consequences

Proposed Action

The Proposed Action would slightly expand the railroad infrastructure, which may cause a slight decrease in the visual quality of the area, but overall, the impact would be minimal as disturbed areas are revegetated, and the visual quality would remain moderate for the area. The analysis was carried out consistent with the FHWA guidelines to identify potential impacts to visual resources, as further described in Appendix A of this EA.

Lagoon Landscape Unit

With implementation of the Proposed Action, the Lagoon Landscape Unit would not be substantially different from its existing visual quality and exposure. The Proposed Action would be consistent with an existing use within an area that is surrounded by open space. The Proposed Action would slightly expand the railroad infrastructure, which may cause a slight decrease in the visual quality of the area, but overall, the impact would be minimal and the visual quality would remain moderate-high for the area.

The general visual quality of the existing landscape unit would remain moderate-high (3.34) due to the lack of development within the lagoon and the small buffer between the lagoon and the residential development. The vividness of the landscape unit would remain high (4) due to the high memorability of the landscape. The intactness would continue to remain moderate-high (3) due to the natural landscape's freedom from encroaching elements. The unity would continue to remain moderate-high (3) due to the landscapes semi-cohesive compromise between the built environment and the natural environment.

As mentioned above, the Buena Vista Lagoon is considered a visual resource according to the General Plans and Local Coastal Programs of the cities of Carlsbad and Oceanside. Since the Lagoon is considered to be a visual resource, the community is sensitive to the preservation of the Lagoon and its surrounding open space landscape. Since the railroad ROW is an existing use that extends through the Lagoon and has been accepted by the community as a long-term existing use, the Proposed Action would not affect the sensitivity of the Landscape Unit. The Buena Vista Lagoon would continue to possess a high (4) visual sensitivity. The Lagoon Landscape Unit would continue to be exposed to the train passengers, freeway/local roadway travelers along Broadway Drive and Carlsbad Boulevard, recreational users, and community residents. The overall viewer exposure level for the Lagoon Landscape Unit exposure level is the average from the above groups that are able to view the Lagoon Landscape Unit. The overall viewer exposure for the Lagoon Landscape Unit is moderate (2). Overall, the visual response would remain moderate-high (3) with implementation of the Proposed Action.

The overall visual quality of the Proposed Action upon the Lagoon Landscape Unit would not be adverse and visual character and quality and viewer sensitivity and exposure would remain as existing.

Carlsbad Village Landscape Unit

With implementation the Proposed Action, the Carlsbad Village Landscape Unit would not be substantially different from its existing visual quality and exposure. The Proposed Action would be consistent with an existing use within the existing railroad ROW that is surrounded by development. The Proposed Action would slightly expand the railroad infrastructure, which could potentially cause a slight decrease in the visual quality of the area, but overall, the impact would be minimal and the visual quality would remain moderate for the area.

The general visual quality of the existing landscape unit with implementation of the Proposed Action would continue to remain moderate (2) with the continued maintenance of the area. The village type development would continue to provide a moderate (2) level of vividness to the viewer. The intactness would continue to remain low (1) due to the extensive development in the area. The cohesive village physical environment would provide for a moderate-high (3) unity within the landscape unit.

As mentioned above, the Carlsbad Village Landscape Unit is comprised of a variety of development and the beach. Although the area does not contain an extensive amount of open space within the Developed Segment, the Village possesses a distinct character and urban aesthetic appeal that is preserved within the community. According to the City of Carlsbad Circulation Element, Carlsbad Village Drive is considered a "Community Scenic Corridor" that leads to the beach. Since this is a prime corridor of the community, the views from the corridor are preserved and shall maintain their existing character. The Carlsbad Village Landscape Unit would continue to possess a moderate (2) viewer sensitivity. The Carlsbad Village Landscape Unit would continue to be exposed to the train passengers, freeway/local roadway travels along Grand Avenue and Carlsbad Village Drive, office/commercial workers, and community residents. The overall viewer exposure level for the Carlsbad Village Landscape Unit exposure level is the average from the above groups that are able to view the Carlsbad Village Landscape Unit. The overall viewer exposure for the Carlsbad Village Landscape Unit would continue to be moderate-high (3) with implementation of the Proposed Action. Overall, the visual response would remain moderate (2.5) with implementation of the Proposed Action.

The overall visual quality of the Proposed Action upon the Carlsbad Village Landscape Unit would not be adverse and visual character and quality and viewer sensitivity and exposure would remain as existing.

No Action Alternative

If the Proposed Action is not implemented, the existing visual quality would remain as described in the Section 3.1.2 – Affected Environment above.

3.1.3.1 Potential Visual Impacts to Train Travelers

Proposed Action

With implementation of the Proposed Action, the visual impacts to the train travelers would remain the same as the existing views because the Proposed Action would remain within the existing railroad ROW, which is relatively linear for this segment of the LOSSAN corridor. Presently, views from the train are limited due to movement but consist of views of the Buena Vista Lagoon open space and Carlsbad Village development.

Areas directly adjacent and below the train would be difficult to view from the train, but some of the mature riparian vegetation in the Buena Vista Lagoon would be removed and fill soil would be deposited to allow for construction access and space for the additional track. Views of these improvements would be difficult to see from the train due to the improvements location being directly underneath and adjacent to the trains that pass through. The Proposed Action would restore vegetation lost during construction, but it would take several years to fully restore the mature vegetation that would be lost.

The level of the visual impact to train passengers relates to the visual sensitivity of passengers on future trains. Many passengers are focused on reading a paper, a book or magazine, or working on a computer, when riding the train. These riders would not be sensitive viewers. Others focus on the scenery that is afforded from the train, and these would be the more sensitive viewers. The Proposed Action would primarily offer views of Buena Vista Lagoon open space and the Carlsbad Village development. Therefore, with implementation of the Proposed Action, the train passenger's view would not be substantially impacted.

No Action Alternative

The No Action Alternative would pose no additional adverse impacts to viewers from the train for this segment of the LOSSAN Corridor. The existing visual conditions in the Buena Vista Lagoon and Carlsbad Village would not change and sensitive viewers would continue to experience the same visual resources that exist today, as described in Section 3.1.2 – Affected Environment above.

3.1.3.2 Analysis of Key Viewpoints

As noted above, the Proposed Action would be visible from train passengers and from the four Key Viewpoints chosen for this analysis. The resulting visual impacts to these viewpoints and associated viewers are described below. As shown in Figures 3.1-2 to 3.1-5, visual simulations were prepared for these four viewpoints in order to better understand the visual impact of the Proposed Action from these four locations.

Key Viewpoint #1

Key Viewpoint #1 represents views from the Broadway Street cul-de-sac and the adjacent undesignated recreational trails.

Proposed Action

The Proposed Action would create access roads and remove some existing vegetation and add fill to the Buena Vista Lagoon within the railroad ROW during construction. The access roads would be revegetated and the fill would remain during operation of the Proposed Action. From this viewpoint, the overall character of the area would remain consistent with the existing character, because the open space of the Lagoon mostly would remain as existing and all improvements would be contained within the existing railroad ROW, which has been operational through this corridor for more than a century.

The Proposed Action would not create a substantial change in existing character. The Proposed Action would maintain the moderate-high (3) visual quality and a moderate-high (3) viewer response of the viewshed, resulting in a moderate-high (3) visual impact with implementation of the Proposed Action. In other words, the visual quality of the Proposed

Action area from this Key Viewpoint would be slightly reduced as additional fill is added to the viewshed, but the overall visual quality would remain moderate-high from the viewer's perspective.

No Action Alternative

The No Action Alternative would not impact the existing visual setting at Key Viewpoint #1.

Key Viewpoint #2

Key Viewpoint #2 represents views from the Carlsbad Boulevard Bridge.

Proposed Action

Similar to Key Viewpoint #1, construction the Proposed Action would create access roads and remove some existing vegetation and add fill to the Buena Vista Lagoon within the railroad ROW that would be visible from this Key Viewpoint. The access roads would be revegetated and the fill would remain during operation of the Proposed Action. From this viewpoint, the overall character of the area would remain consistent with the existing character, because the open space of the lagoon mostly would remain as existing and all improvements would be contained within the existing railroad ROW, which has been operational through this corridor for more than a century.

The Proposed Action would not create a substantial change in existing character. The Proposed Action would maintain the moderate-high (3) visual quality and a moderate-high (3.5) viewer response of the viewshed, resulting in a moderate-high (3.25) visual impact with implementation of the Proposed Action. In other words, the visual impact of the Proposed Action area from this Key Viewpoint would be slightly reduced as additional fill is added to the viewshed, but the overall visual quality would remain moderate-high.

No Action Alternative

The No Action Alternative would not impact the existing visual setting at Key Viewpoint #2.

Key Viewpoint #3

Key Viewpoint #3 represents views from the Carlsbad Village Station Platform and offers views of the Carlsbad Village Station, the platform, the railroad tracks, the bus station, and the parking lot.

Proposed Action

As shown in Figure 3.1-4, the existing platform would be removed and replaced with a new narrower platform (including all new amenities such as benches, signage, and hardscaping), an additional railroad track alignment, a fence dividing the two railroad tracks, a pedestrian undercrossing, bus station, and parking lot improvements. The entire viewshed is currently developed and would be redeveloped, so no open space would be converted to development within this viewshed. The viewshed does not contain any designated scenic resources.

The Proposed Action would not create a substantial change in existing character. With implementation of the Proposed Action the visual quality would remain moderate-high (3). The viewer response of the viewshed would remain moderate-high (3), resulting in a moderate-high (3) visual impact with implementation of the Proposed Action. No adverse visual impacts were identified with implementation of the Proposed Action from this Key Viewpoint, all visual impacts would be considered negligible.

No Action Alternative

The No Action Alternative would not impact the existing visual setting at Key Viewpoint #3.

Key Viewpoint #4

Key Viewpoint #4 represents views from where the railroad tracks cross Grand Avenue. The viewshed is completely developed with railroad signal crossings in the foreground, the historical train station to the east, the railroad tracks to the south, and Rotary Park, a parking lot, and commercial development to the southwest.

Proposed Action

As shown in Figure 3.1-5, the existing railroad track alignment would be shifted to the west and an additional track would be aligned parallel to the east of the existing track with adequate separation in between. The railroad crossings would be shifted farther to the west in order to accommodate the new track alignments. The historical train station to the east would remain as is. The Proposed Action would encroach approximately three feet into the Rotary Park to accommodate the realigned track; thus, removing some vegetation and trimming the existing trees that are directly adjacent to the railroad ROW within the three-foot encroachment. The three feet that would be removed from the park is currently part of the railroad ROW; and therefore, no additional land would be acquired outside of the existing railroad ROW. The entire viewshed is currently developed and would be redeveloped, so no open space would be converted to development within this viewshed. The viewshed does not contain any designated scenic resources.

The Proposed Action would not create a substantial change in existing character. With implementation of the Proposed Action the visual quality would be slightly reduced to moderate (2.34) due to the removal of minimal vegetation. The viewer response of the viewshed would remain moderate (2.5), resulting in a moderate (2.42) visual impact with implementation of the Proposed Action. Minimal adverse visual impacts were identified with implementation of the Proposed Action from this Key Viewpoint; therefore, all visual impacts would be considered negligible.

No Action Alternative

The No Action Alternative would not impact the existing visual setting at Key Viewpoint #4.

3.1.3.3 Overall Visual Impact of the Proposed Action

Proposed Action

The overall visual impact for the Landscape Units with implementation of the Proposed Action would remain as existing. The overall visual impact from each sensitive viewpoint represents the average visual impact of all of the sensitive viewpoints combined. The Proposed Action would result in a moderate (2.92) visual impact, which is only a slight adverse visual change from the existing moderate-high (3.03) visual impact. The Proposed Action would not cause a substantial adverse change to the overall existing visual impact because the Proposed Action would be located within the existing railroad ROW and replace the existing use with an additional alignment.

No Action Alternative

If the Proposed Action is not implemented, the existing overall visual impact would remain as described in the Section 3.1.2 – Affected Environment above.

3.1.4 Avoidance, Minimization, and/or Mitigation Measures

No mitigation is required because there is no overall visual impact. The visual quality and character and viewer response and sensitivity would remain the same or negligibly change from existing conditions.

3.1.5 Impact Analysis of Mitigation Measures

The Proposed Action would pose negligible visual impacts to the project area and no mitigation measures are required. Since no mitigation is required, there would be no impact of mitigation.

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3.2 Air Quality and Greenhouse Gas Emissions

Information contained in this section is summarized from the *Air Quality and Greenhouse Gas Impact Analysis Technical Report* prepared for the Pacific Surfliner Carlsbad Village Double-Track Project, prepared by Pan Environmental, Inc. (Pan, 2013). This document is provided as Appendix B of this EA.

3.2.1 Regulatory Setting

3.2.1.1 Federal Laws and Regulations

A. United States Environmental Protection Agency

The United States Environmental Protection Agency (EPA) is responsible for enforcing the Clean Air Act (CAA). The EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 CAA and subsequent amendments.

B. National Ambient Air Quality Standards

As required by the CAA, the NAAQS have been established for six major air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 micrometers in diameter (PM_{10}), and less than or equal to 2.5 micrometers in diameter ($PM_{2.5}$), and lead (Pb). Federal standards are summarized in Table 3.2-1.

Table 3.2-1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Concentrations	
		State Standards (CAAQS)	Federal Standards (NAAQS)
Ozone (O_3)	8 hours	0.07 ppm	0.070 ppm
	1 hour	0.09 ppm	NA
Carbon Monoxide (CO)	8 hours	9.0 ppm	9.0 ppm
	1 hour	20 ppm	35 ppm
Nitrogen Dioxide (NO_2)	Annual arithmetic mean	0.03 ppm	0.053 ppm
	1 hour	0.18 ppm	0.10 ppm
Sulfur Dioxide (SO_2)	24 hours	0.04 ppm	NA
	1 hour	0.25 ppm	0.075 ppm
	3 hours	NA	0.5 ppm
Particulate Matter (PM_{10})	Annual arithmetic mean	20 $\mu g/m^3$	NA
	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter – fine ($PM_{2.5}$)	Primary annual arithmetic mean	No Separate State Standard	12 $\mu g/m^3$
	Secondary annual arithmetic mean	No Separate State Standard	15 $\mu g/m^3$
	24 hours	No Separate State Standard	35 $\mu g/m^3$

Pollutant	Averaging Time	Concentrations	
		State Standards (CAAQS)	Federal Standards (NAAQS)
Lead (Pb)	Rolling 3-month Average	No Separate State Standard	0.15 μg/m^3
	Quarterly Average	No Separate State Standard	1.5 μg/m^3
	30-day average	1.5 μg/m^3	NA
Hydrogen Sulfide	1 hour	0.03 ppm	NA
Sulfates	24 hours	25 μg/m^3	NA
Vinyl Chloride (chloroethene)	24 hours	0.01 ppm	NA
Visibility-Reducing Particles	8 hours (10:00 a.m. to 6:00 p.m. Pacific Standard Time)	Extinction coefficient of 0.23 kilometer—visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.	NA

Notes: mg/m^3=milligrams per cubic meter; NA=no standard implemented; ppm=part per million; μg/m3=micrograms per cubic meter [a] EPA Region 9, correspondence states that the old $PM_{2.5}$ 24-hour standard of 65 μg/m^3 be utilized as this standard was the standard provided when the State Implementation Plan (SIP) was last approved.
Source: Pan Environmental, Inc., 2013

General Conformity Rule

The 1990 Amendment to CAA Section 176 requires the EPA to promulgate rules to ensure that federal actions in nonattainment and maintenance areas conform to the appropriate State Implementation Plan (SIP). These rules, known as the General Conformity Rule (40 Code of Federal Regulations (CFR) Parts 51.850-51.860 and 93.150-93.160), require any federal agency responsible for an action in a nonattainment/maintenance area to determine whether that action conforms to the applicable SIP, is exempt from the General Conformity Rule requirements. According to Section 176 of the CAA, conformity to an SIP means that federally supported or funded activities would not (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other milestones. Since the Proposed Action requires FRA approval, it is subject to compliance with the General Conformity Rule. The scope of the rule is limited to non-attainment or maintenance areas for criteria pollutants and does not include Mobile Sources Air Toxics or Greenhouse Gases (GHGs).

An action would conform to a SIP and be exempt from a conformity determination if the action is within one of the exemption categories specified by the General Conformity Rule. An action would also conform to a SIP and be exempt from a conformity determination if an applicability analysis shows that the total direct and indirect emissions from the action would be less than specified emission thresholds, known as federal *de minimis* levels.

C. Greenhouse Gas Emissions

Greenhouse gas (GHG) is any gas that absorbs infrared radiation in the atmosphere. GHGs include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrochlorofluorocarbons (HCFCs), O_3, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). There are currently no federal requirements for evaluation. See 3.2.1.2 C for state requirements.

D. Toxic Air Contaminants

Toxic air contaminants (also referred to as hazardous air pollutants or air toxics) are air pollutants that may cause adverse health effects, particularly cancerous or noncancerous effects. Toxic air contaminants are substances listed in EPA's hazardous air pollutant program or California's Assembly Bill (AB) 1807 or AB 2588 air toxics programs.

Toxic air contaminants are not considered criteria air pollutants because the federal and state agencies do not address them specifically through the setting of NAAQS. Instead, EPA regulates toxic air pollutants through statutes and regulations.

EPA has established "National Emission Standards for Hazardous Air Pollutants" as required by the CAA Amendments. These include source-specific regulations that limit allowable emissions of such pollutants. In 2007, EPA finalized a rule to reduce hazardous air pollutants from mobile sources. In this rule, EPA identified 93 hazardous air pollutants emitted from mobile sources, and the health effects and characteristics of each pollutant are described in the EPA Integrated Risk Information System.

The state regulates toxic air contaminants primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588).

3.2.1.2 State Laws and Regulations

A. State Ambient Air Quality Standards

In California, the California Air Resources Board (CARB), which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for meeting the state requirements of the Federal CAA, administering the California Clean Air Act (CCAA), and establishing the California Ambient Air Quality Standards (CAAQS). The CCAA requires all State air districts to endeavor to achieve and maintain the CAAQS. The CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibly reducing particles. State standards are summarized in Table 3.2-1 above. CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB oversees the functions of local Air Pollution Control Districts and air quality management districts, which in turn administer air quality activities at the regional and county levels.

B. State Implementation Plan

Federal clean air laws require areas with unhealthy levels of O_3, CO, NO_2, SO_2, and PM_{10} to develop plans, known as a SIP, which describes how a region would attain the NAAQS. The SIP consists of many elements, including regional air pollutant emission inventories, rules and regulations, and control measures for stationary and mobile sources. The CARB adopted the SIP in 1994.

In 2015, EPA established a new federal 8-hour standard for O_3 of 0.070 parts per million (ppm). EPA previously identified 16 areas in California, including the San Diego Air Basin (SDAB) that violated the 2008 8-hour O_3 standard (0.075ppm). Each non-attainment area's classification and attainment deadline was based on the severity of its O_3 problem. SIPs demonstrating attainment of the new federal O_3 standard must be adopted by the local air districts and CARB, and submitted to EPA.

C. Greenhouse Gas Emissions

California has passed several bills and the Governor has signed at least three executive orders (EO) regarding GHGs. GHG statues and executive orders include AB 32, SB 97, SB 375, SB 1368, EO S-03-05, EO S-20-06 and EO S-01-07 as further described in the *Air Quality and Greenhouse Gas Impact Analysis Technical Report* (Appendix B).

3.2.1.3 Local Plans, Policies, and Ordinances

A. San Diego County Air Pollution Control District

The County of San Diego Air Pollution Control District (APCD) operates entirely within the SDAB and has jurisdiction over the entire area of San Diego County. The APCD is responsible for monitoring air quality, as well as planning, implementing and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations that regulate stationary source, area source, point source and certain mobile source emissions. The APCD is also responsible for establishing permitting requirements for stationary sources and ensuring that new, modified or relocated stationary sources do not create net emission increases to be consistent with the region's air quality goals.

B. Regional Air Quality Strategy Plan

Under the requirements of the CCAA, each air basin is required to develop its own strategies to achieve both state and federal air quality standards. The continued violations of ambient air quality standards in the SDAB, particularly for O_3 in inland foothill areas, require that a plan be developed outlining the pollution controls that would be undertaken to improve air quality. In the San Diego region, this attainment planning process is embodied in the Regional Air Quality Strategies (RAQS) developed jointly by the APCD and SANDAG. The RAQS serves as APCD's blueprint to reduce smog-forming emissions and provides feasible emission control measures for mobile and stationary sources within San Diego County.

San Diego County's Eight-Hour Ozone Attainment Plan was finalized in May 2007 and outlines emission control strategies that would be implemented in order to reduce O_3 emissions throughout the County. Strategies in the Attainment Plan include creating allowable emission budgets and control measures for stationary sources through adoption of rules, permits, inspections and testing. The RAQS outlines APCD's plans and control measures designed to attain the state air quality standards for O_3.

C. San Diego Forward: The Regional Plan

The Regional Plan was adopted by SANDAG on October 9, 2015. Chapter 2—A Strategy for Sustainability: Smart Growth and environmental protection through transportation choices—includes the components of the Sustainable Communities Strategy required by SB 375.

3.2.2 Affected Environment

Pollutant emissions from sources and atmospheric interactions determine the quality of air. The pollution effect on receptors establishes the extent to which air quality is degraded. Air quality in a given location is described by the concentration of various air pollutants in the atmosphere, expressed in units of ppm or micrograms per cubic meter (μ/m^3). Both long-term climate factors and short-term weather fluctuations that control pollution dispersion conditions and affect concentration levels are considered part of the air quality resource. Physical effects of ambient air quality

within an area depend on the characteristics of receptors and the type, amount, and duration of pollutants in the ambient air that are consistent with the goal of preventing harmful effects. Information regarding the location and nature of all significant emission sources is important to establish the air quality in the area.

3.2.2.1 Air Basin

The Proposed Action is located within the SDAB, an area of mild Mediterranean Climate, with moderate year-round temperatures. A repetitive pattern of frequent early morning cloudiness, hazy afternoon sunshine, daytime onshore breezes, and little temperature change is characteristic of the San Diego climate throughout the year.

Meteorological and climatological conditions influence ambient air quality. The climate of the San Diego region is characterized by warm, dry summers and mild winters, and is dominated by a semi-permanent, high-pressure cell located over the Pacific Ocean. This high-pressure cell maintains clear skies for much of the year, drives the dominant onshore circulation, and helps create two types of temperature inversions, subsidence and radiation, that contribute to local air quality degradation. Subsidence inversions occur during warmer months as descending air associated with the Pacific Ocean high-pressure cell comes into contact with cool marine air. The boundary between the two layers of air is a temperature inversion that traps pollutants below it. Radiation inversions typically develop on winter nights with low wind speeds, when air near the ground cools by radiation and the air aloft remains warm. A shallow inversion layer that can trap pollutants is formed between the two layers.

In Carlsbad, the normal daily maximum temperature is 75.0 degrees Fahrenheit (°F) in August, and the normal daily minimum temperature is 46.6°F in December. The normal precipitation in Carlsbad is 9.93 inches annually, occurring primarily from November through February. The annual mean wind speed is 4.6 miles per hour (mph).

In Oceanside, the normal daily maximum temperature is 76.7°F in August, and the normal daily minimum temperature is 39.1°F in December. The normal precipitation in Oceanside is 10.37 inches annually, occurring primarily from December through February. The annual mean wind speed is 4.1 mph.

3.2.2.2 Attainment Areas

As required by the Federal CAA, the EPA has established the NAAQS for major air pollutants: O_3, CO, NO_2, SO_2, PM, and Pb. An area is classified as “attainment" if the primary NAAQS have been achieved and "nonattainment" if the NAAQS are not achieved. Once a previously designated nonattainment area meets the standards and additional redesignation requirements in the CAA [Section 107(d)(3)(E)], EPA will designate the area as a “maintenance area.” Under the Federal standard, San Diego County is in non-attainment for 8-hour O_3 and a maintenance area for CO. All other pollutants are in attainment of Federal standards.

3.2.2.3 Major Air Pollutants

The SDAB is designated and classified as a marginal nonattainment area for the federal O_3 standard. The SDAB is also currently designated by CARB as nonattainment for the state O_3, PM_{10} and $PM_{2.5}$ standards; attainment for CO, NO_2, SO_2, Pb, sulfates; and unclassified for hydrogen sulfide and visibility. An area designated as unclassified for a pollutant is one in which insufficient data exists to support a designation of attainment or nonattainment (17 Code of California Regulations (CCR) 70305).

Regional air quality is monitored locally by the APCD in conjunction with the CARB. The Camp Pendleton monitoring facility is the closest air quality monitoring station to the Proposed Action, approximately 5 miles northwest of the project site. This station monitors ambient O_3 concentrations. The Escondido monitoring facility, located approximately 15 miles southeast of the project site, provides monitoring data for NO_2, CO, PM_{10} and $PM_{2.5}$. The monitored ambient SO_2 concentrations are from the Downtown San Diego station.

Table 3.2-2 presents a summary of the highest air pollutant concentrations monitored at these stations during three years (2010-2012) for which the APCD has reported data. As further described in Table 3.2-2, over the three years, CO and NO_2 concentrations in the project area have been well below the 1-hour and 8-hour federal and state standards and no exceedances have been recorded within the three-year time period. Concentrations collected demonstrate that the area has generally exceeded the 8-hour O_3 federal and state standards, and recorded 1-hour concentrations of O_3 maintained the state standard of 0.09 ppm. $PM_{2.5}$ and PM_{10} have generally been below federal and state standards. $PM_{2.5}$ has exceeded federal standards once in 2012, and PM_{10} has exceeded state standards once in 2010. Concentrations levels for PM_{10} have steadily declined over the three-year time period and have not exceeded federal standards.

Table 3.2-2
Ambient Air Quality Summary

Pollutant	Average Time	NAAQS	CAAQS	Maximum Concentrations		
				2012	2011	2010
O_3	1 hour	-	0.09	0.09	0.09	0.09
	8 hours	0.075	0.070	0.08	0.07	0.08
PM_{10}	24 hours	150	50	33	40	42
	Annual	-	20	18.0	18.8	20.9
$PM_{2.5}$	24 hours	35	-	71	27	33
	Annual	12	12	10.5	10.4	10.5
CO	8 hours	9	9.0	3.8	2.3	2.5
	1 hour	35	20	4.4	3.5	3.9
NO_2	Annual	0.053	0.030	0.012	0.013	0.014
	1 hour	0.100	0.18	0.062	0.062	0.064
SO_2	Annual	0.030	-	-	0.001	0.000
	24 hours	0.140	0.04	-	0.002	0.002
	1 hour	0.075	0.25	-	0.013	0.008

Note: The unit for O_3, CO, NO_2, and SO_2 is parts per million (ppm), and the unit for PM_{10} and $PM_{2.5}$ is micrograms per cubic meter ($\mu g/m^3$).
Source: Pan Environmental, Inc., 2013.

3.2.2.4 Toxic Air Contaminants

Toxic air contaminants (also referred to as hazardous air pollutants or air toxics) are air pollutants that may cause adverse health effects, particularly cancer or noncancerous effects. Toxic air contaminants are substances listed in the EPA's hazardous air pollutant program or California's AB 1807 or AB 2588 air toxics program. Toxic air contaminants are not criteria air pollutants because the federal and state agencies do not address them specifically through the setting of NAAQS or CAAQS. Instead, the EPA and CARB regulate toxic air pollutants through statutes and regulations.

EPA has established "National Emission Standards for Hazardous Air pollutants" as required by the CAA Amendments. These include source-specific regulations that limit allowable emissions of such pollutants. In 2007, EPA finalized a rule to reduce hazardous air pollutants form mobile sources. In this rule, EPA identified 93 hazardous air pollutants

emitted from mobile sources, and the health effects and characteristics of each pollutant are described in the EPA Integrated Risk Information System.

3.2.2.5 Greenhouse Gas Emissions

GHG emissions are defined as those naturally occurring and anthropogenic (derived from human activities) chemical compounds within the atmosphere that absorb and reflect infrared radiation emitted by the Earth's surface. The remaining infrared radiation that is not absorbed by these gases escapes into space. This natural warming process that occurs in the Earth's atmosphere is known as the greenhouse effect. In 2008, California accounted for approximately seven percent of U.S. emissions. Global climate change gases include, but are not limited to, water vapor, CO_2, CH_4, N_2O, O_3, HCFCs, HFCs, PFCs, and SF_6. The introduction of synthetic GHGs (HCFCs, HFCs, PFCs, and SF_6) has resulted in an overall increase in GHGs in the atmosphere, which has led to a phenomenon referred to as the enhanced greenhouse effect. This increase in GHGs in the atmosphere has led to more infrared radiation being reradiated to the Earth's surface and less radiation escaping into space, which leads to an overall warming of the Earth. Additionally, synthetic GHGs break down the Earth's natural atmospheric O_3 layer.

In 2011, CARB developed the statewide GHG emission inventory for 2000 through 2009. According to CARB, total gross California GHG emissions in 2009 were 457 million metric tons of CO_2e. The transportation sector accounted for approximately 38% of the total GHG emissions, whereas the industrial sector accounted for approximately 20%. Emissions from electricity generation were about 23%, with almost equal contributions from in-state and imported electricity.

3.2.3 Environmental Consequences

Proposed Action

3.2.3.1 Operational Impacts

The Proposed Action is one of the projects listed under the Rail Improvements Alternative of the LOSSAN Program. The purpose of the Rail Improvements Alternative is to support growth for demand in the LOSSAN corridor rail services and improve rail operations and reliability. The Project has been previously addressed in the LOSSAN Final PEIR/PEIS and in key regional and corridor plans including the San Diego Forward: The Regional Plan (The Regional Plan) (SANDAG, 2015a) and Final EIR (SANDAG 2015b). Pursuant to 176(c) of the federal CAA (42 USC Section 7506(c)), the Regional Plan must conform to the SIP for air quality. This conformity determination was issued December 2, 2015 and means that transportation activities will not create new air quality violations, worsen existing violations, or delay the attainment of the NAAQS. The transportation network improvements identified in the Regional Plan include double-tracking the LOSSAN Corridor and this Proposed Action is included in the network improvements. Therefore, the Air Quality/GHG analyses is a project-level, rather than a regional-level analysis because of the inclusion in The Regional Plan implies that the Proposed Action's operational emissions meet the conformity requirements imposed by U.S. EPA, CARB and the APCD. The following air quality impacts discussion was evaluated qualitatively using the conclusions provided in the LOSSAN PEIR/PEIS and The Regional Plan Final EIR.

Conformity Analysis

Train trips associated with the Proposed Action would be increased by 51 trips in 2030 (SANDAG 2013d); therefore, air pollutant emissions from locomotives would potentially be increased compared to existing conditions, as further

discussed in the infrastructure Development Plan for the LOSSAN Rail Corridor, August 2013. However, stringent regulations and requirements for locomotives have been published by the EPA and CARB, resulting in anticipated decreases in locomotive emissions over time. The EPA has adopted Tier 4 emission standards for locomotives to be implemented in 2015. Tier 4 standards are expected to provide a 76 percent reduction in nitric oxide and nitrogen dioxide (NO_x) emissions and a 70 percent reduction in PM emissions over current Tier 2 standards. In addition, CARB supports the use of locomotives built with diesel particulate filters and selective catalytic reduction. Implementation of these features is expected to provide up to a 90% reduction in NO_x and PM emissions. The useful life of a locomotive engine is approximately 10 years and, because the rate of growth in freight rail is higher in the western U.S. than the rest of the country, the BNSF (and other west coast rail operators) is likely to have a more rapid locomotive turnover rate (older units replaced with new or overhauled units), increasing the ratio of newer, lower emission units to older units in its fleet (FRA, 2009).

In addition, the Proposed Action would result in beneficial reductions in emissions in localized areas by decreasing rail congestion and associated locomotive idling time along the corridor and by improving two at-grade crossings where vehicular traffic delays now occur and replacing an at grade pedestrian crossing at the station with a pedestrian underpass. In addition, increases in train trips could reduce the use of passenger vehicles and freight hauling trucks on regional roadways, which would reduce vehicle miles traveled (VMT) and idling time on streets, resulting in air pollutant emission reductions in the region. Increased train ridership and associated reduction in VMTs translates into a reduction in CO emissions, which would be beneficial to the SDAB since it is currently designated as a maintenance area for CO.

With a reduction in vehicle emissions of CO and locomotive emissions of NO_x (an ozone precursor), implementation of the Proposed Action would not result in an increase in criteria pollutants for which the SDAB is currently designated as a maintenance or nonattainment area under federal NAAQS. Therefore, there would be no adverse operational impacts to air quality from operation of the Proposed Action and there would be no conflict with local air quality attainment or maintenance plans to achieve or maintain federal ambient air quality standards.

Greenhouse Gases

As noted above, the Proposed Action is one of the projects included in the LOSSAN Program. As a result of the 51 trips per day increase in train trips by 2030 associated with the Proposed Action, GHG emissions could potentially increase. However, future operations would employ system enhancements that would result in beneficial reductions in emissions in localized areas by decreasing rail congestion and associated locomotive idling time. In addition, new emission standards for locomotives will reduce GHG associated with operations. Increased ridership and freight trains translates to reduced VMT's and less GHG emissions associated with vehicle use. Therefore, there is not an adverse impact to air quality associated with operational GHG emissions.

Toxic Air Contaminants

Diesel particulate matter (DPM) emissions associated with rail operations would be the primary source of air toxics impacts resulting from the Proposed Action. While train trips would be increased, the Proposed Action is designed to reduce train congestion and delays along the corridor, which would reduce locomotive idling time. Reductions in locomotive idling time would substantially decrease DPM emissions. Furthermore, implementation of mitigation measures specified in the LOSSAN PEIR/PEIS, including installation of diesel particulate filters, fleet turnover to newer technologies, and reduction of idling time through infrastructure improvements and automatic anti-idling devices

installed on locomotives. These measures would further reduce DPM emissions from locomotives. As previously mentioned, the EPA has adopted Tier 4 emission standards for locomotives to be implemented in 2015. The CARB also supports the introduction of locomotives built with diesel particulate filters and selective catalytic reduction, which would substantially reduce DPM emissions from locomotives. Therefore, the Proposed Action would not be expected to have an adverse air toxics impact.

Odor Impact

The apparent presence of an odor in ambient air depends on the properties of the substance emitted, its concentration in facility emissions, and dilution of emissions between the emissions point and sensitive receptors. Locomotives would generate a certain number of odors during operation. Odors would be attributable to concentrations of unburned hydrocarbons from fuel combustions. Unburned hydrocarbon emissions from locomotives would typically be small when the locomotives are operating at cruising speeds. Since, the Proposed Action will increase rail operation efficiency and decrease idling times, substantial amounts of odor will not be generated. Therefore, operation of the Proposed Action would not result in adverse odor impacts.

3.2.3.2 Construction Impacts

General Conformity

Estimated annual air pollutant emissions during construction phases are shown in Table 3.2-3. The model output files are included in Appendix A of the Air Quality and Greenhouse Gas Impact Analysis (Appendix B of this EIR).

The air pollutant emissions were estimated to be below the *de minimis* limits for non-attainment and maintenance criteria pollutants (Table 3.2-3). Therefore, the Proposed Action would not have adverse impacts on air quality during construction.

Table 3.2-3
Estimated Annual Construction Air Pollutant Emissions

Year	Estimated Maximum Annual Air Pollutant Emissions (tons/year)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2016	0.74	7.77	4.68	<0.01	0.81	0.56
2017	1.56	15.83	9.02	0.02	0.83	0.76
2018	0.53	5.40	3.20	<0.01	0.27	0.25
De Minimis level	**100**	**100**	**100**	**NA**	**NA**	**NA**
Exceeds De Minimis level?	**No**	**No**	**No**	**--**	**--**	**--**

Note: VOC is Volatile Organic Compound
Source: Pan Environmental, Inc., 2013.

Greenhouse Gases

Table 3.2-4 summarizes the annual GHG emissions associated with the construction of the Proposed Action. There is no FRA-adopted standard for GHG emissions.

Table 3.2-4
Estimated Annual Construction GHG Emissions

Year	Estimated Annual GHG Emissions (metric tons/year)			
	CO_2	CH_4	N_2O	Total CO_2e
2016	657.94	0.19	0.00	661.83
2017	1,433.67	0.41	0.00	1,442.28
2018	532.05	0.15	0.00	535.25

Source: Pan Environmental, Inc., 2013.

Toxic Air Contaminants

Toxic air contaminants would be emitted from heavy-duty equipment during construction. DPM is known to contain high concentration of carcinogenic compounds. Risks associated with these compounds are typically evaluated on a lifetime of chronic exposure (that is, 24 hours a day, seven days per week, 365 days a year for 70 years). Because the construction related emission of diesel exhaust would only occur for three years, construction activities would not result in chronic long-term exposure. Therefore, air quality impacts related to exposure of sensitive receptors to substantial air toxic contaminants associated with construction of the Proposed Action would not be adverse.

Odor Impacts

Certain amounts of odors would be generated from vehicles and equipment tailpipe exhaust emissions during construction of the Proposed Action. Odors would be attributable to concentrations of unburned hydrocarbons from fuel combustion. However, these are typically small and construction of the Proposed Action would not cause adverse odor impacts.

No Action Alternative

3.2.3.3 Operational Impacts

If the Proposed Action is not implemented, future population growth in the SDAB likely would result in greater traffic congestion and increased VMT in personal passenger vehicles. This could result in increased air emissions even with future improved emissions controls. As such, under the No Action Alternative, there may be increased emissions of air pollutants, GHGs and air toxics associated with vehicle emissions. Freight and passenger train trips would increase from 50 trips per day (current) to approximately 101 trips per day in San Diego County by 2030/2040. This would increase rail congestion and, consequently, idling time. As a result, train related emissions would be more under the No Action Alternative than the Proposed Action.

In addition, the No Action Alternative would be inconsistent with the overarching goal of The Regional Plan for the San Diego Region to provide a variety of transportation choices. The Regional Plan also describes how the San Diego Region will meet mandated GHG emission reductions based on alternative transportation projects.

3.2.3.4 Construction Impacts

The No Action alternative would not involve construction. Therefore, no construction related criteria pollutant, GHG or air toxic emissions would be generated and no associated adverse air quality impacts would occur.

3.2.4 Avoidance, Minimization, and/or Mitigation Measures

It has been determined that operational air quality and GHG emission impacts resulting from implementation of the Proposed Action would be beneficial, specifically from reducing emissions in localized areas by decreasing rail congestion and associated locomotive idling time along the corridor and by improving two at-grade crossings where vehicular traffic delays now occur and replacing an at grade pedestrian crossing at the Carlsbad Village Coaster Station with a pedestrian underpass. In addition, increases in train trips from 50 to 101 per day would reduce the use of passenger vehicles and freight hauling trucks on regional roadways, which would reduce vehicle travel miles and idling time on streets, resulting in emission reductions in the region. It has also been shown above that construction of the Proposed Action will not exceed *de minimis* thresholds for pollutant emissions. Therefore, no mitigation measures are required during construction of the Proposed Action or future railroad operations associated with the Proposed Action. However, SANDAG would implement the certain avoidance and minimization measures to further reduce air quality impacts.

SANDAG would implement the following avoidance and minimization measures during construction:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require that all trucks maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.
- Use alternative fuels for construction equipment when feasible.
- Minimize equipment idling time.
- Maintain properly tuned equipment.

SANDAG would implement the following avoidance and minimization measures during operations:

- Install diesel particulate filters on locomotives.
- Use liquefied natural gas for engines.
- Reduce idling time to reduce DPM and other emissions.
- Install anti-idling devices on locomotives, designed to automatically shut-off the main diesel internal combustion engine used for locomotive motive power after a specified time period when specified parameters (e.g., engine water temperature, ambient temperature, battery charge, railcar brake pressure, etc.) are at

acceptable levels, and then automatically restart the engine when parameters are no longer at acceptable levels.

- Retrofit head-end power sources in passenger locomotives with after-treatment technologies to reduce emissions.
- Use a combination of lean-NOx catalyst and diesel particulate filter.
- Design stations and associated ingress/egress to provide efficient vehicle movements, to reduce idling time and congestion.

3.2.5 Impact Analysis of Mitigation Measures

Proposed Action

Implementation of the Proposed Action would result in negligible adverse air quality and GHG emission impacts and potentially beneficial impacts to air quality and GHG emissions. Mitigation measures are not required and therefore will not have an impact.

No Action

Implementation of the No Action Alternative would not require mitigation. Because no mitigation is required, there would be no impact of mitigation measures.

3.3 Biological Resources and Wetlands

The information provided in this section is based on the information contained in the *Pacific Surfliner Carlsbad Village Double-Track Biological Technical Report* (Merkel & Associates, Inc., 2016), attached as Appendix C of this EA.

3.3.1 Regulatory Setting

3.3.1.1 Federal Endangered Species Act

The ESA of 1973 and subsequent amendments provide for the conservation of listed species or candidates for listing as endangered or threatened species and the ecosystems on which they depend. The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over federally listed plants, wildlife, and resident fish, and the National Oceanic Atmosphere Administration (NOAA) Fisheries Service has jurisdiction over anadromous fish and marine fish and mammals.

3.3.1.2 ESA Authorization Process for Federal Actions (Section 7)

Section 7 of the ESA applies to actions that are conducted, permitted, or funded by a Federal agency. Under ESA Section 7, the lead Federal agency conducting, funding, or permitting an action must consult with USFWS or NOAA Fisheries, as appropriate to ensure that the project would not jeopardize the continued existence of an endangered or threatened species or destroy or adversely modify designated critical habitat. For the Proposed Action the lead Federal agency is FRA. If a proposed action "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment (BA) evaluating the nature and severity of the expected effect. In response, USFWS or NOAA Fisheries issues a biological opinion (BO), with a determination that the action either:

- May jeopardize the continued existence of one or more listed species (jeopardy finding) or result in the destruction or adverse modification of critical habitat (adverse modification finding), or
- Would not jeopardize the continued existence of any listed species (no Jeopardy finding) or result in adverse modification of critical habitat (no adverse modification finding).

The BO issued by USFWS or NOAA Fisheries Service may stipulate discretionary "reasonable and prudent" conservation measures. If it is determined the project would not jeopardize the continued existence of a listed species, USFWS or NOAA Fisheries Service would issue an incidental take statement to authorize the proposed activity. The Incidental Take Statement may include Terms and Conditions which are required actions intended to implement the "Reasonable and Prudent" measures under ESA, Section 7.

3.3.1.3 ESA Prohibitions (Section 9)

Section 9 of the ESA prohibits the "take" of any fish or wildlife species listed under the ESA as endangered. Take, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the species, including significant habitat modification." Take of threatened species also is prohibited under Section 9 unless otherwise authorized by Federal regulations. Additionally, Section 9 prohibits removing, cutting, and maliciously damaging or destroying federally listed plants on sites under Federal jurisdiction.

3.3.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) Title 16, USC, Section 703 enacts the provisions of treaties between the U.S. and Great Britain (for Canada), the U.S. and Mexico, the U.S. and Japan, and the U.S. and Russia and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes hunting seasons and

capture limits for game species and protects migratory birds, their occupied nests, and their eggs. EO 13186 (January 10, 2001) directs each Federal agency taking actions that have or may have a negative impact on migratory bird populations to work with USFWS to develop a memorandum of understanding (MOU) that would promote the conservation of migratory bird populations. Protocols developed under the MOU must include the following agency responsibilities:

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions
- Restore and enhance migratory bird habitats, as practicable
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

The EO is designed to assist Federal agencies in their efforts to comply with the MBTA, and does not constitute a legal authorization to "take" migratory birds.

3.3.1.5 Clean Water Act

The Federal CWA was enacted as an amendment to the Federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to Waters of the United States (WoUS). The CWA now serves as the primary Federal law protecting the quality of the nation's surface waters, including wetlands.

3.3.1.6 Permits for Fill Placement in Wetlands and other Waters of the United States (Section 404)

Under the CWA Section 404, the USACE and the EPA regulate the discharge of dredged and fill materials into WoUS. WoUS refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands, including any or all of the following:

- Areas within the ordinary high water mark (OHWM) of a stream, including non-perennial streams with a defined bed and bank, and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands. Wetlands are defined for regulatory purposes as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

Project sponsors must obtain a permit from the USACE for all discharges of dredged or fill material into WoUS, including wetlands, before proceeding with a proposed activity.

WoUS in the project area are under the jurisdiction of the Los Angeles District of the USACE. Compliance with CWA Section 404 requires compliance with several other environmental laws and regulations. The USACE cannot issue an individual permit or verify the use of a general permit until the requirements of NEPA, ESA, and the NHPA have been met. Additionally, the USACE cannot issue or verify any permit until a water quality certification, or waiver of certification, has been issued pursuant to CWA Section 401. Section 404 permits may be issued only for the least environmentally damaging practicable alternative. That is, authorization of a proposed discharge is prohibited if there is a practicable alternative that would have less adverse impacts and lacks other significant adverse consequences. Refer to Section 3.14, Water Quality and Water Resources, for further discussion of stormwater discharge and water quality certification processes (e.g. Section 401 certification) under the CWA.

3.3.1.7 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 661-666c) requires consultation with USFWS and the State fish and wildlife agencies where the waters of any stream or other body of water are proposed, authorized, permitted, or licensed to be impounded, diverted, or otherwise controlled or modified under a federal permit or license. Consultation is undertaken for the purpose of preventing loss of and damage to wildlife resources. Consultation is not necessary where the maximum surface area of water impoundment is less than 10 acres.

3.3.1.8 Executive Order 13112, Invasive Species

EO 13112, Invasive Species, directs all federal agencies to prevent and control introductions of invasive nonnative species, and to minimize the economic, ecological, and human health impacts caused by invasive species infestations. It requires the NEPA process include determinations of the likelihood of introducing or spreading invasive species, and a description of measures being taken to minimize their potential harm.

3.3.1.9 Coastal Zone Management Act

The U.S. Congress recognized the importance of meeting the challenge of continued growth in the coastal zone by passing the CZMA in 1972. This act provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." Section 307 of the CZMA, called the "federal consistency" provision, gives states a strong voice in federal agency decision making, which they otherwise would not have, for activities that may affect a state's coastal uses or resources. Generally, federal consistency requires that federal actions, within and outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. The federal government certified the California Coastal Management Program (CCMP) in 1977. The enforceable policies of that document are Chapter 3 of the California Coastal Act of 1976. All federal actions are reviewed for consistency with these policies.

3.3.2 Affected Environment

3.3.2.1 Physical Setting

The Biological Study Area (BSA) lies within the Buena Vista Hydrologic Area (HA) (Basin No. 4.20) of the greater Carlsbad Hydrologic Unit (HU) (Basin No. 4.00). Within the northern portion of the site, the railroad is elevated from the surrounding lands while the railroad within the southern portion of the site is generally at ground level. The approximate elevation is 6 to 44 feet above mean sea level (AMSL). The Buena Vista watershed is the fourth-largest system within the Carlsbad HU and extends inland from the coast approximately 10.6 miles. The watershed totals 14,437 acres in area and approximately 80% of the watershed is developed. The Buena Vista watershed is long and relatively narrow in shape and divided into two basins, Vista and El Salto. The project site is located within the lower El Salto basin (Basin No. 4.21).

Buena Vista Creek is the main drainage system within the watershed. The creek originates on the western slopes of the San Marcos Mountains and discharges into the Pacific Ocean via Buena Vista Lagoon. The lagoon was originally a tidal system; however, during most summers the lagoon was closed to the sea, and in 1940, a weir was constructed across the mouth of the lagoon, eliminating normal tidal flow. As a result of the weir and other factors, Buena Vista Lagoon primarily functions as a freshwater lake with a fringing freshwater marsh. Tidal influence is limited seasonally to large winter storm events when waves surge over the weir. The total surface area of the lagoon is approximately 200

acres and characterized by four basins; from east to west, they are East Basin [located east of I-5], Central Basin (bound to the east by I-5 and Coast Highway to the west), Railroad Basin (bound to the east by Coast Highway and NCTD ROW to the west), and Weir Basin (basin bound to the east by NCTD ROW and the Pacific Ocean to the west). The Weir and Railroad Basins are cumulatively referred to as the West Basin; the project site spans the West Basin. The Weir Basin is almost devoid of native vegetation; the exception to this is along the railroad berm, north of the trestle, and along the St. Malo (residential area to the west of the ROW, within the northwestern corner of the lagoon) shoreline where only a few plants exist. An artificial earth berm has also been built around the St. Malo properties to control flooding, and ornamental vegetation has been planted next to the lagoon throughout these residences. The Railroad Basin is dominated by freshwater marsh species. The lagoon in the general vicinity of the project site is relatively shallow, with the western side being slightly deeper than the east at an approximate depth of three and a half feet from the surface water elevation to the bed of the lagoon and another one and a half foot of depth from the bed of the lagoon to the bottom of the soft mud layer.

Buena Vista Creek does have floodplains and floodways as designated by the Federal Emergency Management Agency (FEMA) associated with it. The West Basin is predominately identified as a 100-year floodplain, extending beyond the limits of the open water associated with the lagoon to the toe of the railroad slope.

Buena Vista Creek and Buena Vista Lagoon are both identified under Section 303(d) of the CWA as impaired waterbodies. The lagoon is specifically listed as an impaired waterbody for nutrients and sedimentation/siltation, while the creek is listed as impaired for sediment toxicity and selenium (USEPA, 2010).

The project area lies entirely within the California Coastal Zone boundary. In addition, the lagoon and upland habitat within the southwestern portion of the project area are designated as conserved lands by the California Department of Fish and Wildlife (CDFW).

Buena Vista Lagoon is a permanent water body, fed by Buena Vista Creek, also a perennial system. The lagoon is completely surrounded by urban land uses in which dense development and fringing non-native plant communities define both the northern and southern boundaries. The lagoon remains minimally linked to riparian wetland habitats along Buena Vista Creek upstream and beach environments at the mouth. Although small, remnant stands of native vegetation persist along steeper bluff slopes within the urban areas to the south; these upland habitat fragments are generally separated from the lagoon itself and contribute little if any benefit to the lagoon communities.

3.3.2.2 Vegetation Types/Flora

Twelve vegetation types were identified within the BSA during the biological surveys, as shown in Table 3.3-1 below. A complete list of all floral species observed within the BSA during biological surveys, as well as detailed descriptions of vegetation types can be found in Appendix C of this EA. Figure 3.3-1 shows the location of vegetation types within the BSA.

3.3.2.3 Wildlife Habitats/Fauna

The BSA is limited in its capacity to provide high value habitat for wildlife species due to the regular maintenance of the railroad tracks and adjacent dense urban development. However, Buena Vista Lagoon does provide habitat for a variety of wildlife species, including invertebrates, fish, amphibians, reptiles, birds, and mammals that are dependent on biological elements such as habitat for food, shelter, and breeding situated in a surrounding urban setting. A complete list of all fauna species observed within the BSA during biological surveys, as well as detailed descriptions of wildlife

habitats and fauna can be found in Appendix C of this EA. There is no critical habitat and/or listed species breeding habitat within the BSA.

Table 3.3-1
Vegetation Types within the Biological Study Area

Vegetation Type	Holland/Oberbauer Code	Existing Acreage
Open water	64100	10.46[1]
Southern willow scrub	63320	0.14
Coastal and valley freshwater marsh	52410	6.82
Disturbed coastal and valley freshwater marsh	52410	0.17
Diegan coastal sage scrub	32500	0.73
Disturbed Diegan coastal sage scrub	32500	0.12
Maritime succulent scrub	32400	0.20
Non-native grassland	42200	3.24
Eucalyptus woodland	79100	1.55
Non-native vegetation	11000	10.85
Disturbed habitat	11300	11.69
Urban/developed	12000	101.17[2]
	Total:	**147.14**

Notes: [1] The total acreage of open water is inclusive of the open water under the bridge over Buena Vista Lagoon. This amounts to 0.12 acres.
[2] The total acreage of urban developed is less than the amount of open water under the bridge over Buena Vista Lagoon. This amounts to 0.12 acres.
Source: Merkel & Associates, Inc., 2016.

3.3.2.4 Federally Listed Species

One federally listed endangered species, the California least tern (*Sternula antillarum browni*) was observed within the BSA during the biological surveys. Small numbers of California least tern were observed foraging over/within the open water associated with Buena Vista Lagoon during biological surveys. This species is a summer visitor to coastal San Diego County and nests on sandy ocean beaches, drying margins of lagoons, mudflats, and salt pond levees. They generally arrive mid-April and leave by the end of August. Within the BSA, there are no potential nesting sites for this species due to lack of suitable habitat. Nearby nesting locations include Batiquitos Lagoon (approximately 6.4 miles to the south of the study area) and the Santa Margarita River on Camp Pendleton (approximately 5.5 miles to the north of the study area).

3.3.2.5 Occurrence Potential of Federally Listed Species

A. Species Previously Identified as Breeding within the BSA

The light-footed clapper rail (*Rallus longirostris levipes*), a federally listed endangered species, is known to have occurred within the BSA but was not detected during the biological surveys. Historically, the species was found in the coastal tidal basins in Southern California but has adapted to freshwater or brackish coastal water basins. The fresh to brackish water basins at Buena Vista Lagoon have a history of supporting the light-footed clapper rail. Light-footed clapper rails have historically been known to occupy marsh habitat within the East and Central Basins of the Lagoon, but individuals have also been observed in all basins. Although no light-footed clapper rails were detected within the BSA during the 2012 or 2013 surveys, this species has a history of occurring within the Railroad and Weir Basins of Buena Vista Lagoon in and adjacent to the BSA within the marsh habits represented in the BSA. As recently as 2012, four pairs of light-footed clapper rails were detected in the Western Basin of Buena Vista Lagoon. The light-footed clapper rail is therefore expected to have a high potential to nest within the BSA as well as within the NCTD ROW. Peak nesting season occurs in April and May (but can extend from March through July).

B. Species Potentially Present within the BSA

Below is a list of species that were not detected within the BSA during the biological surveys but have a potential to occur onsite.

Fairy Shrimp

In Coastal San Diego County, three species of fairy shrimp (Branchiopods class) are present, two of which are endemic, the San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*). The third species, versatile fairy shrimp (*Branchinecta lindahli*) is a habitat generalist common throughout western North America. Fairy shrimp have the potential to live in vernal and/or ephemeral pools/swales, which form in shallow depressions underlain by a substrate of hardpan, clay, or basalt near the surface that restricts the percolation of water. These pools can occur singularly but more typically occur in pool/swale complexes due to the local hydrology, geology, and topography. San Diego and Riverside fairy shrimp generally require all of the following pool characteristics: shallow to moderate pool depths (2 to 12 inches) that hold water for sufficient lengths of time (7 to 60 days) in flat to gently sloping topography and any soil type with a clay component and/or an impermeable surface or substrate layer.

Federally listed endangered San Diego and Riverside fairy shrimp have the potential to occur within low-lying areas, parallel to the railroad tracks, north of the lagoon. Specifically, surface soil cracking was detected at the northern most portion of the alignment (just south of Cassidy Street), on both the west and east sides of the track as well as at Buena Vista Lagoon on a dirt path leading to the bridge. Surface soil cracking is an indicator of recent inundation in concave landscape positions where water has ponded. The Proposed Action is located approximately five miles north of the Carlsbad Poinsettia Station where San Diego and Riverside fairy shrimp are known to occur.

Dry and wet season protocol sampling occurred on the project site where federally listed San Diego and Riverside fairy shrimp were determined to have the potential to occur. Three distinct locations were sampled, as shown on Figure 3.3-1. The sample sites were located within low-lying areas where surface soil cracking was evident during dry season surveys. All sites are parallel to the existing railroad track and north of Buena Vista Lagoon. From north to south the sample locations are described as follows:

1. A swale located west of the railroad tracks just south of Cassidy Street;
2. Undeveloped land (also referred to as urban basin) located east of the railroad tracks just south of Cassidy Street; and
3. An access path pool located east of the railroad tracks within an existing dirt access road leading to the bridge over Buena Vista Lagoon.

No indicator plant species for vernal pools and no fairy shrimp were detected onsite during the wet season protocol sampling. In addition, no indicator plant species for vernal pools were detected onsite during the dry season protocol sampling or during the general biological survey in July 2013 and no fairy shrimp were detected onsite during the dry season protocol sampling. Only versatile fairy shrimp were collected on the project site during wet season sampling. Versatile fairy shrimp are commonly found throughout San Diego County and do not have a special status designation.

SOURCE: Merkel & Associates, Inc., 2016

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Wet Season Protocol Sample Areas

FIGURE 3.3-1

California Gnatcatcher

The federally listed threatened coastal California gnatcatcher (*Polioptila californica californica*) (CAGN) is a year-round resident in coastal San Diego County areas generally below 1,500 feet in elevation. CAGN prefer coastal sage scrub habitat that is dominated by California sagebrush and flat-top buckwheat. The breeding season generally extends from February through August with the peak of nesting activities occurring from mid-March through mid-May. A moderate size isolated patch of Diegan coastal sage scrub is present within the BSA, just south of the lagoon. The vegetation community is dominated by California sagebrush, flat-top buckwheat, and California encelia, which are all plant species found in typical breeding and foraging habitat of the coastal CAGN. However, there are no historical records for the coastal CAGN within the BSA, nor did M&A biologists detect any coastal CAGN during focused avian surveys performed in 2012 or biological surveys performed in 2013. In addition, protocol surveys conducted in 2013 as part of the Buena Vista Lagoon Enhancement Project did not indicate the presence of any coastal CAGN. Furthermore, per the Buena Vista Lagoon Land Management Plan Elements, the coastal CAGN is an infrequent winter visitor to the lagoon, likely due to a lack of suitable breeding habitat. Overall, due to the lack of historical and recent observations of CAGN within the BSA and the relatively small and isolated patch of Diegan coastal sage scrub, the potential for nesting by this species within the BSA is low.

3.3.2.6 Jurisdictional Wetlands and Other Waters of the U.S.

Within the BSA, Buena Vista Lagoon is identified as jurisdictional, traditional navigable waters of the WoUS based on the presence of OHWM indicators. As previously mentioned, the lagoon was originally a tidal system until a weir was constructed across the mouth of the lagoon in 1940, which eliminated the natural tidal flow. Now, marine influence is limited seasonally to large winter storm events when waves surge over the weir and through groundwater influence with saline water penetration through the alluvial sediments. The lagoon is a permanent waterbody, and as such, is defined as a permanent water.

There are three waterways that run parallel to the railroad tracks. All of these waterways drain into Buena Vista Lagoon; however, surface OHWM indicators are generally not present between the terminus of the drainage patterns and the lagoon. One ephemeral waterway is located in the northern portion of the BSA (west side of the railroad; Waterway #1) and generally receives water runoff only after rain events. This waterway is defined as a non-relatively permanent water (non-RPW). The other two ephemeral waterways (Waterway #2 and #3) convey urban runoff in addition to water runoff after rain events. These waterways have also been defined as non-RPW.

The open water associated with the lagoon (inclusive of the water under the railroad tracks) is classified as non-wetland WoUS due to the lack of hydrophytic vegetation. The marsh communities within the lagoon are classified as a wetland based on the presence of hydrophytic vegetation, hydric soils, and hydrology. The USACE (inclusive of waters of the state) jurisdictional boundaries were delineated according to the identified OHWM. Where hydrophytic vegetation extended beyond OHWM indicators, hydric soils and hydrologic indicators were absent and hydrophytic vegetation would only be considered wetlands under the California Coastal Act (CCA). The ephemeral waters noted above have been classified as non-wetland WoUS due to the lack of hydrophytic vegetation (as well as lack of hydric soils), but evident drainage patterns. Small segments of the drainages are also dominated by hydrophytic vegetation. Detailed information regarding jurisdictional wetlands and other WoUS assessed for this study can be found in Appendix C of this EA.

3.3.2.7 Wildlife Movement and Nursery Sites

The railroad ROW is primarily bound by urban development, which typically does not provide suitable shelter for wildlife species. The ROW could potentially be used for movement between areas by urban tolerant species but is not expected to serve as a nursery site. Buena Vista Lagoon is completely surrounded by urban land uses in which dense development and fringing non-native plant communities define both the northern and southern boundaries. As a result, the lagoon is primarily isolated from the upstream riparian wetland habitats of Buena Vista Creek and the beach environments at the mouth. As it pertains to avian species, the lagoon primarily serves as a stopover for migratory species as they transit between areas along the Pacific Flyway. However, the lagoon also supports year-round resident avifauna as well. The lagoon and vegetation adjacent to the lagoon could serve as a nursery site for wildlife.

3.3.3 Environmental Consequences

3.3.3.1 Proposed Action

A. Vegetation Communities

Direct Impacts

Construction of the Proposed Action would primarily result in direct, permanent impacts to habitat immediately adjacent to the existing tracks, which is classified as either non-native vegetation, urban/developed, or disturbed habitat. The exception to this is within the immediate vicinity of the lagoon where creation of a second track (inclusive of removal of the existing bridge and construction of a new bridge) would result in permanent impacts to open water and coastal and valley freshwater marsh, predominantly located on the east side of the existing tracks. In addition, construction of the second track south of the lagoon would permanently impact thin portions of disturbed Diegan coastal sage scrub and eucalyptus woodland.

Temporary impacts to habitat would result from use of temporary access paths, staging areas, and areas necessary to construct the bridge over the lagoon. North of the lagoon, the communities impacted as a result of temporary impacts are disturbed habitat, non-native grassland, eucalyptus woodland, non-native vegetation, and a small patch of disturbed Diegan coastal sage scrub. Construction of the second track over the lagoon would require additional areas/platforms that would temporarily result in impacts to open water and coastal and valley freshwater marsh. South of the lagoon, the communities temporarily impacted would be urban/developed, disturbed habitat, and non-native vegetation.

Impacts to vegetation communities resulting from the Proposed Action are provided in Table 3.3-2 and shown on Figure 3.3-2 below.

Direct impacts to open water and coastal and valley freshwater marsh, regardless of classification as permanent or temporary would be adverse. Direct impacts to disturbed Diegan coastal sage scrub and non-native grassland regardless of classification as permanent or temporary would be adverse since these vegetation communities are regionally considered to be sensitive habitat types. Impacts to the following upland communities, regardless of classification as permanent or temporary, would not be considered adverse since these habitats are not regionally considered to have high conservation value: non-native vegetation, eucalyptus woodland, disturbed habitat, and urban/developed land.

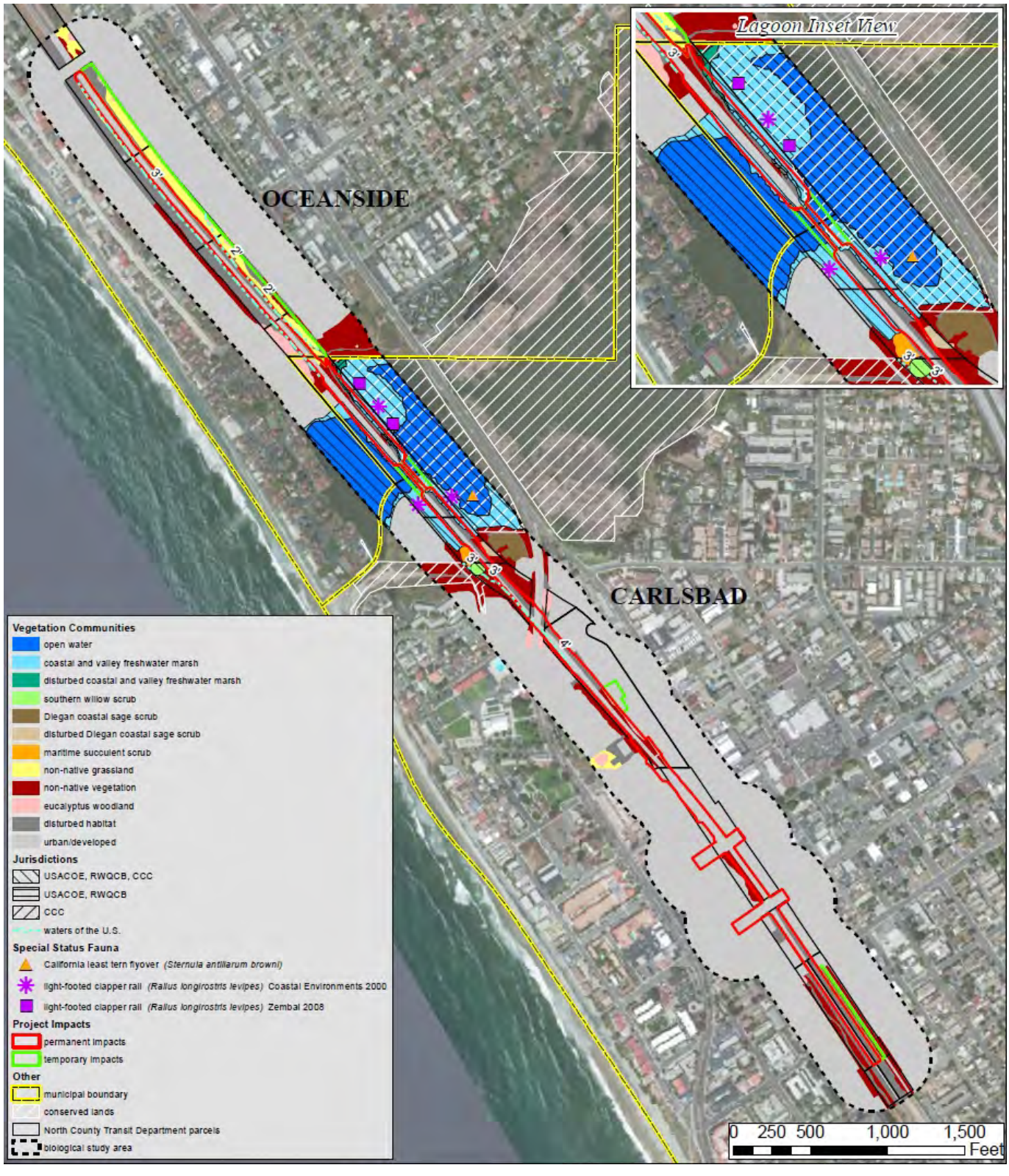
Table 3.3-2
Impacts to Vegetation Communities within the Biological Study Area

Vegetation Type	Project Impacts (acreage)			Mitigation Ratio[1]	Required Project Mitigation (acreage)			
					Permanent Impacts			Temporary Impacts
	Permanent	Temporary	Grand Total		Total Mitigation	Wetland Associated (Federal requirement for no net loss)	Any combination of Creation/ Restoration/ Enhancement/ Mitigation Bank	Restoration
Open water	0.07	0.20	0.27	3:1	0.21	0.07	0.18	0.20
Southern willow scrub	0.00	0.00	0.00	3:1	0.00	0.00	0.00	0.00
Coastal and valley freshwater marsh	1.01	0.13	1.14	3:1	3.03	1.01	2.02	0.13
Disturbed coastal and valley freshwater marsh	0.05	0.00	0.05	2:1	0.10	0.05	0.05	0.00
Wetland Associated Subtotal:	**1.13**	**0.33**	**1.46**		**3.34**	**1.13**	**2.21**	**0.33**
Diegan coastal sage scrub	0.00	0.00	0.00	2:1	0.00	0.00	0.00	0.00
Disturbed Diego coastal sage scrub	<0.01	0.00	<0.01	1:1	0.004	0.00	0.004	0.00
Maritime succulent scrub	0.00	0.00	0.00	3:1	0.00	0.00	0.00	0.00
Non-native grassland	0.03	2.44	2.47	0.5:1	0.015	0.00	0.015	2.44
Higher Value Uplands Subtotal:	**0.03**	**2.44**	**2.47**		**0.019**	**0.00**	**0.019**	**2.44**
Non-native vegetation	1.28	0.40	1.68	0	0.00	0.00	0.00	0.00
Eucalyptus woodland	0.01	0.18	0.19	0	0.00	0.00	0.00	0.00
Disturbed habitat	3.61	1.38	4.99	0	0.00	0.00	0.00	0.00
Urban/developed land	8.08	0.45	8.53	0	0.00	0.00	0.00	0.00
Lower Value Uplands Subtotal:	**12.98**	**2.41**	**15.39**		**0.00**	**0.00**	**0.00**	**0.00**
Total[2]:	**14.14**	**5.18**	**19.32**		**3.36**	**1.13**	**2.23**	**2.77**

Notes: [1] Mitigation ratio only applicable to permanent impacts as temporarily impacted areas would be restored in place at a 1:1 ratio. If restoration in place were not feasible, temporary impacts would be mitigated at the same ratio as permanent impacts.

[2] Totals are calculated in MS Excel and, in several instances, take into account impacts from project elements that occur in the thousandths. This may result in rounding that could cumulatively affect the manual summation of acreages.

Source: Merkel and Associates, 2016.



SOURCE: Merkel & Associates, Inc., 2016

9/12/16

Carlsbad Village Double Track EA

Biological Impacts

FIGURE 3.3-2

B. Federally Listed Species

Direct Impacts

Flora Present

The Proposed Action would not result in impacts to any federally listed species of flora, as none are present within the BSA.

Flora Potentially Present

There are no federally listed species of flora that were determined to have a low, moderate or high potential to occur within the BSA.

Fauna Present

Light-Footed Clapper Rail. The light-footed clapper rail is known to historically occupy the coastal and valley freshwater marsh within the BSA and at least three territories have historically been documented within and or immediately adjacent to the project footprint. While the most recent surveys have not detected presence of rails, it is anticipated that they remain in and adjacent to the BSA. Construction of the Proposed Action would likely result in take of the light-footed clapper rail as a result of permanent and temporary loss of habitat, elevated noise levels during construction and temporary night lighting during construction. In the event construction were to commence within the marsh during the breeding season there would be a high risk of a direct loss of rails through nest abandonment or nest destruction, which, as previously mentioned, would result in take of a federally listed species as it is defined under Section 9 of the ESA. Take of a federally listed species would be considered an adverse impact. However, consultation between the FRA or USACE and the USFWS under Section 7 of the ESA would be required, which would identify measures to minimize adverse effects to federally listed species. Section 7 consultation is underway.

Fauna Potentially Present

Fairy Shrimp. Federally listed endangered San Diego and Riverside fairy shrimp could potentially be present within three distinct low-lying areas, parallel to the railroad tracks. However, as discussed above, no federally listed fairy shrimp were detected on the project site during the protocol surveys. Versatile fairy shrimp, both male and female, were found in two of the three sampling locations, including the swale and the access path pool. However, versatile fairy shrimp are commonly found throughout San Diego County and do not have a special status designation. No other pertinent observations pertaining to federally listed fairy shrimp were noted during the survey efforts. As such, the Proposed Action would not result in any adverse impacts to federally listed fairy shrimp.

Coastal California Gnatcatcher. There is a low potential for federally listed threatened coastal CAGN to occupy the isolated patch of Diegan coastal sage scrub south of the lagoon. Despite the presence of disturbed Diegan coastal sage scrub immediately west of the suitable habitat, the disturbed community is sparsely vegetated and is separated from the adjacent suitable Diegan coastal sage scrub by an approximate six-foot high chain-link fence. As such, if the coastal CAGN were present onsite, it is expected that it would be limited to the area of undisturbed Diegan coastal sage scrub only. In the instance that coastal CAGN were present within the Diegan coastal sage scrub, temporary elevated noise levels during construction could potentially affect the species. However, monitoring studies suggest that coastal CAGN may be tolerant of adjacent construction activities and high ambient noise levels. Based on the low

potential for presence and distance to potentially suitable habitat from the project footprint (approximately 68 feet), elevated noise levels from construction would not be expected to adversely affect CAGN individuals by disrupting normal behavioral patterns including, but not limited to breeding, feeding, or sheltering.

Indirect Impacts

Fauna Present

Light-Footed Clapper Rail. Indirect impacts to the federally listed light-footed clapper rail are expected as a result of increasing noise generated through increased train trips accommodated by a second track. Noise generated from an increase in train trips resulting from a second track are expected to increase gradually over time. Based on estimated projections of future train levels of service, on average the project would accommodate an increase in train frequency full capacity. The increased level of service would also correlate with an increase in the number of occurrences when two trains simultaneously pass one another, which is expected to result in a short period of distinctly elevated noise. As such, the increased frequency of train services, as well as the increased number of instances when two trains simultaneously pass one another, would result in increased overall noise level generation.

The greatest potential noise impact on clapper rails would be a reduced effectiveness of communication between individuals in close proximity to the tracks, particularly prior to and during the breeding season. As a result, the noise of passing trains would tend to shorten the period of time during which communications could effectively occur. However, due to the intermittent nature of train noise, only brief periods of communication disturbances would occur, resulting in either periods of ineffective communication or behavioral changes by individual clapper rails. The brief punctuated disruptions in communication would not be expected to adversely disrupt normal behavioral patterns including, but not limited to, breeding, feeding or sheltering. In addition, due to the length of time over which noise would increase, clapper rails are expected to become acclimated to the increased ambient noise conditions, on a multigenerational basis, such that the operation of the second track would not be expected to create noise levels that would be distinct from the shifting ambient baseline.

California Least Tern. The California least tern is an opportunistic forager and was observed foraging over/within the lagoon during the biological surveys. Although there are no potential nesting sites within the BSA and no active nesting in the lagoon, indirect impacts could occur to this species from alteration of foraging habitat as a result of elevated turbidity during construction. In addition, there would be a permanent reduction in available open water surface within which foraging may occur as a result of the addition of the second track. However, the permanent loss of open water foraging habitat would be considered minimal, with only an approximate total loss of 0.07 acres (0.05% of the lagoon). As a result, it is expected that the California least tern would utilize other portions of Buena Vista Lagoon if local foraging habitat losses would occur. If present during construction, the temporary construction activities are expected to reduce local foraging area. While the permanent footprint of the project constitutes a negligible portion of the total open water in the lagoon, inadequate control of turbidity during construction could result in an adverse impact to temporarily affected foraging areas. However, these impacts may be reduced by controlling turbidity generation to a small footprint area around the construction zone during the summer least tern breeding season. In addition, consultation between the FRA and the USFWS under Section 7 of the ESA would be required, which would identify mitigation measures to reduce impacts to federally listed species.

C. Jurisdictional Wetlands and Other Waters of the U.S.

Direct Impacts

Construction of the Proposed Action within the vicinity of Buena Vista Lagoon would result in direct, permanent impacts to open water (0.07 acre) and coastal valley freshwater marsh (0.68 acre) predominantly located on the east side of the existing tracks. Permanent impacts to ephemeral waterways (i.e., Waterway #3 and a low-lying depression along a dirt access path leading to the lagoon bridge) would also result from construction of the Proposed Action.

Temporary impacts to habitat would result from use of temporary access paths, staging areas, and areas necessary to construct the bridge over the lagoon. Construction of the second track over the lagoon would require additional areas/platforms that would temporarily result in impacts to open water and coastal and valley freshwater marsh. Direct temporary impacts would also occur to ephemeral waterways (Waterway #2).

Impacts to federal waters resulting from the Proposed Action are provided in Table 3.3-3 below. All direct impacts to federal waters, regardless of classification as permanent or long-term temporary would be adverse and would require mitigation to reduce impacts and achieve the federal requirement for no net loss of biological functions and values.

Impacts to federal waters would require the following permits by regulatory federal and state agencies:

1. USACE, CWA Section 404 permit for placement of dredged or fill material within WoUS;
2. RWQCB, CWA Section 401 state water quality certification/waiver for an action that may result in degradation of waters of the State; and
3. CCC, CZMA Consistency Determination.

Permitting initiation for the Proposed Action has not yet occurred.

Indirect Impacts

Construction of the Proposed Action would be expected to result in indirect impacts to jurisdictional resources within the BSA, most notably from the effects of disturbance and/or clearing of resources within the project footprint that could result in conditions suitable for intrusion of non-native, weedy species and increased erosion or sedimentation within Buena Vista Lagoon. These potential indirect impacts would be considered adverse.

D. Wildlife Movement/Corridors and Nursery Sites

Direct Impacts

Construction of the Proposed Action primarily would result in direct, permanent impacts to habitat immediately adjacent to the existing railroad tracks, which is classified as either non-native vegetation, urban/developed, or

Table 3.3-3
Impacts to Federal Waters within the Biological Study Area

Vegetation Type (Jurisdiction)	Project Impacts (acreage)			Mitigation Ratio[1]	Required Project Mitigation (acreage)			
					Permanent Impacts			Temporary Impacts
	Permanent	Temporary	Grand Total		Total Mitigation	Wetland Associated (Federal requirement for no net loss)	Any combination of Creation/ Restoration/ Enhancement/ Mitigation Bank	Restoration
Open water (USACE, RWQCB, CCC)	0.07	0.20	0.27	3:1	0.21	0.07	0.14	0.20
Southern willow scrub (USACE, RWQCB, CCC)	0.00	0.00	0.00	3:1	0.00	0.00	0.00	0.00
Coastal and valley freshwater marsh (USACE, RWQCB, CCC)	0.68	0.13	0.81	3:1	2.04	0.68	1.36	0.13
Coastal and valley freshwater marsh (CCC only)	0.33	0.00	0.33	3:1	0.99	0.33	0.66	0.00
Disturbed coastal and valley freshwater marsh (CCC only)	0.05	0.00	0.05	2:1	0.10	0.05	0.05	0.00
Wetland Associated Subtotal:	**1.13**	**0.33**	**1.46**		**3.34**	**1.13**	**2.21**	**0.33**
Non-Wetland Waters of the U.S.	0.10	0.03	0.13	1:1	0.10	0.10	0.00	0.03
Waters Subtotal:	**0.10**	**0.03**	**0.13**		**0.10**	**0.10**	**0.00**	**0.03**
Total[2]:	**1.23**	**0.36**	**1.59**		**3.44**	**1.23**	**2.21**	**0.36**

Notes: [1] Mitigation ratio only applicable to permanent impacts as temporarily impacted areas would be restored in place at a 1:1 ratio. If restoration of temporary impacts were not feasible, temporary impacts would be mitigated at the same ratio as permanent impacts.

[2] Totals are calculated in MS Excel and, in several instances, take into account impacts from project elements that occur in the thousandths. This may result in rounding that could cumulatively affect the manual summation of acreages.

Source: Merkel and Associates, 2016.

disturbed habitat. It is expected that wildlife movement by mammals within the project area principally would be focused on the vicinity of Buena Vista Lagoon. Due to dense urban development north and south of the lagoon and the limited and constraining habitat along the beachfront, it is expected that the majority of wildlife movement would be limited to daily home range movements of urban tolerant species such as raccoon, Virginia opossum, and occasional gray fox. There is a low potential for wildlife to travel along the tracks from Loma Alta Creek to the north and/or Agua Hedionda Lagoon to the south. Due to the already limited corridors for wildlife within the project site and the presence of the existing railroad corridor, the Proposed Action is not expected to result in adverse changes to present wildlife movement patterns or intensity.

The project footprint does not include any identified nursery sites. The Proposed Action could result in direct permanent and temporary impacts to habitat of marsh nesting birds. These impacts are not considered to be impacts to nursery sites, due to the absence of colonial nesting areas, rookeries, or other established nursery sites. Potential impacts to individually nesting birds are addressed as habitat impacts discussed above, or in the case of listed species, are discussed separately above (sub-section B. Federal Listed Species). There are no anticipated adverse impacts to nursery sites as a result of the Proposed Action.

Indirect Impacts

There are no indirect impacts to wildlife movement/corridors or nursery sites.

E. Migratory Bird Treaty Act

The BSA has the potential to be utilized by regionally common migratory birds and raptors that are not federally listed species, but are protected under the Federal MBTA. Under the MBTA, it is unlawful, except as permitted by the USFWS, to "take, possess, transport, sell, purchase, barter, import, or export all species of birds protected by the MBTA, as well as their feathers, parts, nests, or eggs. Take means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect (50 CFR 10.12)." It is important to note that "take" as defined under the federal MBTA is not synonymous with "take" as it is defined under the ESA. Since avian species could potentially nest in the onsite habitats, the Proposed Action could result in adverse impacts to active bird and/or raptor nests (if present at time of construction) under the federal MBTA.

3.3.3.2 No Action Alternative

Under the No Action Alternative, the Proposed Action would not be built and impacts to vegetation communities, federally listed species, and jurisdictional wetlands and WoUS, and avian species protected under the MBTA would not occur. Railroad activity through Buena Vista Lagoon and the BSA would increase to approximately 67 trains per day on the current single track, which is considered to be the maximum capacity of the NCTD without the proposed double-track project. Freight train trips would increase from 3-4 trips per day (current) to approximately 8-10 trips per day in San Diego County by 2030/2040. This would increase the ambient noise levels in the lagoon and disturb migratory birds, including the endangered clapper rail. However, as discussed in Section 3.3.3.1(B) above, indirect impacts to clapper rails due to the increased ambient noise levels associated with more frequent freight train trips would not be significant, because it would only be a punctuated disruption in communication that would last for brief moments, and would not be expected to significantly disrupt normal behavioral patterns including but not limited to breeding, feeding or sheltering. As such, no impact to biological resources would occur.

3.3.4 Avoidance, Minimization, and/or Mitigation Measures

It is a requirement of the USFWS and the USACE that impacts be avoided to the extent practicable. Impacts that cannot be avoided are to be minimized. Impacts that remain after avoidance and minimization are to be mitigated.

3.3.4.1 Proposed Action

A. Vegetation Communities

Direct Impacts

The following avoidance and minimization measures would be required to reduce adverse effects to vegetation communities to a negligible level:

BR-1 SANDAG would appoint a monitoring biologist to be onsite during the initial clearing and grubbing of habitat to ensure compliance with all biological avoidance and minimization measures. The biologist would be knowledgeable of upland and wetland biology and ecology. The biologist would perform the following duties:

- Train all contractors and construction personnel on the biological resources associated with this project and ensure that training is implemented by construction personnel. At a minimum, training would include: a) the purpose for resource protection; b) the conservation measures that would be implemented during project construction, including strictly limiting activities, vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the project site by fencing); c) environmentally responsible construction practices; and d) the protocol to resolve conflicts that may arise at any time during the construction process.
- Halt work, if necessary, and confer with FRA to report any violation within 24 hours of discovery of its occurrence.

BR-2 Prior to and during construction activities, the Contractor would implement and maintain Best Management Practices (BMPs) throughout the entire project footprint consistent with standard BMPs. This includes implementation and maintenance of silt fencing or other sediment trapping devices (on land and within the lagoon) in order to prevent run-off from entering the nearby water systems during construction activities as well as incorporation of adequate requirements for dust, drainage, and erosion control into project plans and grading conditions.

BR-3 Prior to construction activities, a hazardous spill response plan would be developed and implemented by the Contractor. At a minimum, for all construction within 100 feet of the lagoon, an adequately sized petroleum spill response kit would be onsite and available for deployment to avoid, or contain accidental discharges to the lagoon.

BR-4 Prior to construction activities, temporary environmental fencing would be placed along the perimeter of the project footprint (as applicable). The fencing would be installed and maintained by the Contractor under direction of the project biologist and construction manager. Fencing would be implemented and maintained in a manner that does not interfere with wildlife movement or flows along the creek systems.

BR-5 Prior to construction activities, a Revegetation Plan for erosion control purposes would be required and implemented by the Contractor to prevent erosion over those areas that would not be permanently converted to urban use and/or restored in place. The plan would be consistent with similar SANDAG plans and include details regarding installation, maintenance and monitoring, success criteria, and remedial measures if warranted. The planting palette would consist of native species similar to those species currently onsite as directed by the project biologist. The planting palette would not include those species listed by the California Invasive Plant Council (Cal-IPC) in the California Invasive Plant Inventory (Cal-IPC 2007). All native seed and plant stock would be from seed and propagules collected from the project footprint or within a five-mile radius of the work area to the extent practicable. Seed sources outside of the five-mile radius would be approved by the project biologist. Maintenance and monitoring would be required for a minimum of 90 days and for compliance with the General Construction Stormwater Pollution Prevention Plan.

BR-6 The following would be made a part of project requirements for the Contractor: a) employees should strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint; b) the project site would be kept as clean of debris as possible (all food related trash items should be enclosed in sealed containers and regularly removed from the site); c) disposal or temporary placement of excess fill, brush or other debris would not be allowed in adjacent waters or wetlands; and d) all equipment maintenance, staging, and dispensing of fuel, oil, coolant or any other such activities would occur in designated staging areas outside of waters or wetlands within the fenced project impact limits. Fueling of equipment would take place within existing paved/urban areas greater than 100 feet from waters or wetlands. Contractor equipment would be checked for leaks each morning and mid-day prior to operation and would be repaired as necessary or removed from the site.

The following mitigation measure would be required to compensate for unavoidable adverse impacts (lost values and functions).

BR-7 Mitigation for unavoidable adverse impacts to disturbed Diegan coastal sage scrub, and non-native grassland would be implemented by the SANDAG through a combination of the following: creation/restoration or creation/restoration combined with enhancement, and/or preservation. If offsite mitigation is required, it is recommended that the final selected mitigation location(s) be located within the Buena Vista Lagoon environment. If mitigation consists of creation, restoration, or enhancement preparation of a Mitigation Maintenance and Monitoring Plan would be required. Maintenance and monitoring of the mitigation area would be conducted for a minimum five-year period or until the final success criteria is achieved. The plan would include, but not be limited to, the following elements: 1) project information, 2) description and goals of the compensatory mitigation, 3) implementation plan for the compensatory mitigation (e.g., site preparation, planting specifications, and planting plan), 4) maintenance activities during the monitoring period, 5) monitoring plan (e.g., success criteria, monitoring schedule, performance standards for success criteria, and annual reports), 6) completion of compensatory mitigation, and 7) contingency measures. General requirements of the plan would include the following:

- All native seed and plant stock would be from seed and propagules within a five-mile radius of the mitigation site(s) to the extent practicable. Seed sources outside of the five-mile radius would be approved by the project biologist. The planting palette would exclude those species listed by Cal-IPC in the California Invasive Plant Inventory (2007).

- Supplemental irrigation would be turned off a minimum of two years prior to the termination/completion of the monitoring program.

Indirect Impacts

Impacts from potential intrusion of non-native, weedy species and erosion/sedimentation would be considered adverse. However, implementation of Avoidance and Minimization Action BR-5 listed above, which requires a Revegetation Plan for erosion control purposes would reduce potential indirect impacts to vegetation communities to a negligible level.

B. Federally Listed Species

The following avoidance and minimization measures would likely be required to minimize adverse effects to federally listed species but may be modified in accordance with Section 7 Consultation Terms and Conditions:

Direct Impacts

Fauna Present

In the event construction were to commence within the marsh during the light-footed clapper rail breeding season there would be a high risk of a direct loss of rails through nest abandonment or nest destruction, which would constitute take of the species under the ESA. It is anticipated that the following Conservation Measures would be identified during a consultation between the FRA and the USFWS under Section 7 of the ESA to address potential take of this species:

BR-8 All environmental permits and authorizations for work would be kept onsite and fully reviewed and complied with by the Contractor and all subcontractors.

BR-9 No clearing, grubbing of grading of coastal and valley freshwater marsh by the Contractor would occur during the light-footed clapper rail breeding season, March 1 to July 31 unless bird monitoring is undertaken by a light-footed clapper rail qualified biologist and the monitoring determine there are no active nests within 500 feet of the work area(s). In the event active nests are within 500 feet of the work areas, work may proceed provided noise monitoring demonstrates work does not create noise in excess of 60 A-weighted decibels equivalent sound level (dBA Leq) or background whichever is higher, and a light-footed clapper rail qualified biologist does not observe any behavioral changes in the event noise levels exceed 60 dBA Leq or background whichever is higher.

BR-10 Noise and lighting barriers would be developed by the Contractor to screen impacts of construction activities from the adjacent marshlands if construction work is to be performed during the breeding season.

BR-11 Replacement marsh habitat would be developed by the Contractor to compensate for the unavoidable loss of clapper rail habitat.

BR-12 During the period April 15 through September 30, turbidity associated with project construction would be contained by the Contractor with the limits of the construction corridor through the use of turbidity curtains deployed around the work area to avoid turbidity impacts on the ability of California least tern to forage in waters adjacent to the work area.

Indirect Impacts

There are no mitigation measures associated with indirect impacts to federally listed species.

C. Jurisdictional Wetlands and Other Waters of the U.S.

It is anticipated the following mitigation measures will be required to compensate the unavoidable impacts to jurisdictional wetlands and other WoUS but may be modified in accordance with Section 404/401 permit conditions:

Direct Impacts

All unavoidable direct impacts to federal waters, regardless of classification as permanent or long-term temporary, would be adverse and would require implementation of habitat-based compensatory mitigation.

BR-13 SANDAG would mitigate in the form of creation/restoration, or creation/restoration combined with enhancement, and/or preservation; however, the mitigation cannot result in a net-loss of federal wetland habitat or wetland functions and values. Therefore, a minimum 1:1 creation/restoration ratio would be applied toward any jurisdictional impacts that result in loss of federal resources. The Proposed Action mitigation is subject to review by regulatory agencies. Preparation of a Compensatory Maintenance and Monitoring Plan would be required. The plan would be consistent with the USACE's April 10, 2008 final rule for compensatory mitigation for losses of aquatic resources (Federal Register April 10, 2008, V73:70 pg. 19594, USACE 2008c). It would include but not be limited to the following elements: 1) project information, 2) description and goals of the compensatory mitigation, 3) implementation plan for the compensatory mitigation (e.g., site preparation, planting specifications, and planting plan), 4) maintenance activities during the monitoring period, 5) monitoring plan (e.g., success criteria, monitoring schedule, performance standards for success criteria, and annual reports), 6) completion of compensatory mitigation, and 7) contingency measures. General requirements of the plan should include the following:

- All native seed and plant stock would be from seed and propagules within a five-mile radius of the mitigation site(s) to the extent practicable. Seed sources outside of the five-mile radius would be approved by the project biologist. The planting palette would not utilize those species listed by Cal-IPC in the California Invasive Plant Inventory (2007).
- Supplemental irrigation would be turned off a minimum of two years prior to the termination/completion of the monitoring program.

Indirect Impacts

Potential indirect impacts to jurisdictional resources resulting from construction of the Proposed Action include intrusion of non-native, weedy species and increased erosion or sedimentation within Buena Vista Lagoon. These potential impacts would be considered adverse. However, implementation of Avoidance and Minimization Measure BR-5 listed above would reduce these impacts to a negligible level.

D. Wildlife Movement/Corridors and Nursery Sites

The Proposed Action occurs entirely within the existing railroad ROW, and as such is not conducive to use as a wildlife corridor. Due to the already limited corridors for wildlife within the project site and the presence of the existing railroad corridor, the Proposed Action is not expected to result in adverse changes to present wildlife movement patterns or intensity. In addition, the project footprint does not include any identified nursery sites. Therefore, no mitigation measures are required.

E. MBTA Protected Species

The BSA has the potential to be utilized by regionally common migratory birds and raptors that are not federally listed species, but are protected under the Federal MBTA. Since avian species could potentially nest in the onsite habitats, the Proposed Action could result in adverse impacts to active bird and/or raptor nests under the Federal MBTA. Therefore, the following mitigation measure is recommended to reduce potential impacts to MBTA protected bird species to a negligible level:

BR-14 To avoid impacts to nesting migratory birds, the Contractor would avoid all clearing, grubbing, or grading of vegetation that have a potential to support active nests from January 15 through September 15, the "restricted work period". If avoidance of the nesting migratory bird breeding season is not feasible, clearing, grubbing or grading of vegetation may occur during the restricted work period if a qualified biologist conducts a focused survey for active nests within 7 days prior to work in the area and determines the area to be free of nesting birds. If an active bird nest were found, then all construction activities undertaken would comply with regulatory requirements of the Federal MBTA including establishing appropriate buffer zones. This would require protection of the nest, eggs, chicks, and adults until such time as the nestlings have fully fledged and are no longer dependent upon the nest site.

3.3.5 Impact Analysis of Mitigation Measures

The mitigation measures identified above are designed to avoid and/or minimize the permanent and temporary adverse impacts to biological resources that may occur from implementation of the Proposed Action. Efforts to restore and revegetate permanently and temporarily impacted areas would require periodic human presence in the impacted areas for a period of five years or more. The activities would be low impact activities such as walking the areas for monitoring, hand weeding, and other maintenance activities using hand tools. A project biologist would oversee all restoration and revegetation efforts to ensure no additional impact to biological resources occurs. Impacts would be beneficial and negligible.

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3.4 Community Impacts and Environmental Justice

The information provided in this section is a summary of the information in the *Pacific Surfliner Carlsbad Village Double-Track Project Community Impact Assessment* (BRG, 2014b) and *Environmental Justice Technical Report* (BRG, 2014c), prepared by BRG Consulting, Inc. The Community Impact Assessment and Environmental Justice Technical Report are provided as Appendices D and E of this document.

3.4.1 Regulatory Setting

3.4.1.1 Federal Standards

The NEPA of 1969 established that the federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [42 U.S.C. 4331(b)(2)]. Final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as, destruction or disruption of human-made resources, community cohesion and the availability of public facilities and services.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires each Federal agency to identify and address, as necessary, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations, including Indian tribes.

The presence of “low-income” and “minority” populations is typically determined through evaluation of U.S. Census Bureau data. For this analysis, minority populations and low-income populations are any readily identifiable group of minority or low-income persons (as further defined in Appendix E of this EA) who live within the study area well as, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who are similarly affected by a proposed U.S. DOT program, policy, or activity.

Executive Order 13166 Improving Access to Services for Persons with Limited English Proficiency, requires each federal agency to ensure that recipients of federal financial assistance provide meaningful access to their programs and activities by Limited English Proficiency applicants and beneficiaries.

The U.S. Department of Transportation Order 5610.2(a) establishes the process that the Office of the Secretary and each Operating Administration within the U.S. Department of Transportation uses to incorporate environmental justice principles (as embodied in the EO 12898) into existing programs, policies, and activities.

The Americans with Disabilities Act [42 U.S.C. Sections 12101 to 12213] prohibits, under certain circumstances, discrimination based on disability.

Uniform Relocation Assistance and Real Property Acquisition Policies Act [42 U.S.C. Chapter 61] ensures that persons displaced because of a federal action or an undertaking involving federal funds, are treated fairly, consistently, and equitably so that such persons would not suffer disproportionate injuries because of projects designed for the benefit of the public as a whole.

3.4.1.2 State Standards

California Government Code Section 65040.12(e) defines environmental justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."

3.4.1.3 Local Standards

City of Carlsbad General Plan

As required by State Planning and Zoning Law, the City of Carlsbad has developed a "comprehensive, long-term plan for the physical development of the City, and of any land outside its boundaries which bears relation to its planning" (State of California, 2000).

The City of Carlsbad General Plan (City of Carlsbad, 2013) discusses core values and vision statements related to community impacts and environmental justice. For example, the core value 'Access to recreation and active healthy lifestyles' has a vision statement to 'Promote active lifestyles and community health by furthering access to trails, parks, beaches, and other recreation opportunities.' One of the goals is 'A visible trails system to link the three lagoons to the coaster stations, to connect environmental resource areas to public transportation.' The Community Design element is the most relevant to this chapter and addresses topics such as the form, character, and quality of development, to advance the community's desire to enhance Carlsbad's setting and quality of life.

Carlsbad Village Master Plan and Design Manual

The Carlsbad Village Master Plan and Design Manual (City of Carlsbad, 2012) is the City of Carlsbad's official statement of design, zoning and land use, and long-range development strategy policy in order to create a strong identity, revitalize the area, enhance the economic potential, and establish specific site development standards for the Village. Additionally, the Village Master Plan and Design Manual, together with the implementing ordinances and Manual of Policies and Procedures serves as the Local Coastal Program (LCP) for the Carlsbad Village Area segment of the Carlsbad Coastal Zone pursuant to the requirements of the CCA.

City of Oceanside General Plan

For the City of Oceanside, the General Plan is "the primary source of long-range planning and policy direction that will be used to guide growth and preserve the quality of life within the City" (City of Oceanside, 2002). To address future growth and development, the General Plan includes goals, objectives, policies, and plan, which are used to guide future land use and development decisions. The Oceanside General Plan contains 10 elements, including a Land Use element that ensures projects are consistent with community character.

3.4.2 Affected Environment

The Proposed Action area is located in the northwestern portion of San Diego County, California, within the cities of Oceanside and Carlsbad along the Pacific coastline, west of I-5. The Proposed Action would be implemented solely within the existing railroad ROW between Cassidy Street in Oceanside and Pine Avenue in Carlsbad, extending through downtown Carlsbad and Buena Vista Lagoon. The developed land surrounding the lagoon is comprised of single-family and multi-family residential, as well as commercial land uses to the east and west of the lagoon.

The project study area is located within the boundaries of three census tracts from the 2010 U.S Census: Tracts 179, 180, and 181. According to the 2010 U.S. Census data for Tracts 179, 180, and 181, 16,328 people live within the project study area, with virtually all of these individuals living within the residential areas located more than half-a-mile from the project study area. Census Tracts 179 and 180 are located between I-5 and the Pacific Coast in the City of Carlsbad, east and west of the railroad tracks, respectively. Census Tract 181 is located in the City of Oceanside, also between I-5 and the coast. The tracts are much larger than the area directly affected by project construction, but they provide a more focused picture of the area affected by the project than does City and County-level demographics.

The study area is split into two distinct communities by the Buena Vista Lagoon, which forms the east/west boundary between the cities of Oceanside and Carlsbad. Considered to be part of the metropolitan San Diego region, the two communities feature a sizeable contingent of commuters who live in the North Coastal portion of San Diego County but commute to work in San Diego, approximately 35 miles south. Oceanside and Carlsbad both have their own distinct community character, influenced by their immediate proximity to the Pacific Ocean and its associated tourism and recreation-based economy.

Generally speaking, the study area is younger, less affluent, and more urbanized than the populations of Carlsbad and Oceanside as a whole. Relative to the rest of the city, lot sizes within the study area are smaller and feature a greater proportion of apartment buildings, so consequently the study area is more densely populated and the median household size is smaller. Because younger adults move more frequently than do older adults, and therefore younger populations tend to be of a more transient nature, there is less community cohesion within the study area compared to the relatively more stable owner-occupied single-family neighborhoods found east of I-5. Areas with high proportions of younger residents generally demonstrate lower levels of community and civic involvement than do older residents.

Guidance for environmental justice (CEQ, 1997) defines minority populations as those communities that meet at least one of the following criteria:

- The minority population of the affected area is greater than 50 percent of the total population.
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

The minority (non-white, including Hispanic) population within Tract 179 is 43 percent of the total population, which is greater than that of the City of Carlsbad (25 percent). The minority population of Tract 180 is 20 percent of the total population, which is less than the City of Carlsbad. The minority population of Tract 181 is 30 percent of the total population, which is less than the City of Oceanside (52 percent). Therefore, collectively the three Project Census Tracts do not have a minority population greater than 50 percent of its total population nor meaningfully greater than the respective City populations, they cannot be considered a minority population.

“Low-income” is defined by SANDAG as income that is below the poverty threshold established by the Department of Health and Human Services which is on the order of the U.S. Census Bureau thresholds and since U.S. Census data is more readily available, that is the threshold used for this analysis. The median household income within Tract 179 is $46,408, which is 45 percent less than that of the City of Carlsbad ($84,632) and 26 percent less than that of the County of San Diego ($62,771). The percentage of households below the poverty level in Tract 179 is 10 percent. The median household income within Tract 180 is $61,190, which is 28 percent less than that of the City of Carlsbad. The

percentage of households below the poverty level in Tract 180 is 12 percent. The median household income within Tract 181 is $66,277, which is 5 percent greater than the City of Oceanside ($62,841). The percentage of households below the poverty level in Tract 181 is 10 percent. Seven (7) percent of the households in the City of Carlsbad are below the poverty level. Ten (10) percent of the households in the City of Oceanside are below the poverty level. Because Census Tracts 179 and 180 have a greater percentage of their households below the poverty level compared to that of the City of Carlsbad as a whole, they are considered to be a low-income population. Census Tract 181 is not considered a low-income population because the poverty level within this tract is consistent with the poverty level of the entire City of Oceanside.

The Village surrounding the existing train station was developed adjacent to the railroad train station in order to take advantage of the railroad's benefits. The existing railroad operations provide daily pedestrian traffic in the core center of the village, and the pedestrian traffic results in revenues for the local businesses. The immediate surrounding local businesses include community and tourist-oriented commercial offices, such as yoga studios, doctor's offices, non-chain restaurants, and souvenir shops. These localized businesses, which provide income for the local owners, are partially supported by their proximity to the train station. Although the development immediately adjacent to the train station and the railroad ROW consists primarily of local non-chain businesses, the more eastern areas of Carlsbad and Oceanside support industrial, manufacturing, and technology-oriented facilities.

3.4.3 Environmental Consequences

3.4.3.1 Community Cohesion and Social Community Impacts

Proposed Action

The existing railroad has existed more or less within its current alignment for over 100 years. Existing railroad crossings would continue to operate, although one crossing within the station would be closed and replaced with an underpass. SANDAG is investigating signaling improvements that would reduce crossing delays on Grand Avenue and Carlsbad Village Drive associated with southbound Coaster Trains. Presently, the crossing gates drop when the southbound Coaster approaches the station. The gates stay down during passenger loading and unloading, and until the train starts up and clears Carlsbad Village Drive. Through signaling improvements, this delay should be substantially reduced in the future. The Proposed Action would not isolate any portion of a neighborhood or ethnic group, nor would it separate residences from community facilities near the project area. No particular social group would especially benefit or be harmed by the Proposed Action, as the project would not permanently disrupt existing developments or communities. The Proposed Action does not propose any features that would alter the existing demographic or socioeconomic make-up of the surrounding communities. The Proposed Action does not propose any features that would result in disproportionately high and adverse impacts, such as air quality, GHG emissions, hazards/hazardous materials, noise, parks and recreation, public health and safety, or relocation, on minority and low-income populations with respect to human health and the environment.

The Proposed Action would improve operational reliability and railroad capacity, which would provide regional transportation benefits to the surrounding communities. By providing improved reliability to the nearby residential communities, the Proposed Action would reduce freeway congestion, GHG emissions, and provide employment opportunities within the railroad operations and maintenance field.

No Action Alternative

The No Action Alternative would involve the continuation of existing conditions with no additional expansion of infrastructure within this segment of the railroad corridor. As such, the No Action Alternative would not result in any social impacts to the community.

3.4.3.2 Environmental Justice

Environmental justice impacts would occur if the following three conditions are met:

- A resource impact is identified in this EA, such as an impact to aesthetic/scenic resources, air quality/ GHG emissions, cultural/historical resources, geology/soils, hazardous materials/waste, noise/vibration, hydrology/water quality, land use/zoning, parks/recreational areas, public health/safety, or transportation;
- The impact would affect the public or human populations; and,
- The impact would affect minority and/or low-income populations to a greater extent than the general population or would be predominately borne by minority or low-income populations.

Proposed Action

Since neither of the minority population criteria are met there are no minority populations within the affected area, implementation would not have the potential to cause disproportionately high and adverse impacts on minority populations. However, because Census Tracts 179 and 180 are considered low-income populations, implementation of the Proposed Action could potentially cause disproportionately high and adverse impacts on low-income populations if a resource impact is identified in this EA that would affect the public or human populations. However, no adverse impacts have been identified in this EA that would affect the public or human populations and therefore, the Proposed Action could not cause disproportionately high and adverse impacts to low income populations.

No Action Alternative

If the Proposed Action were not implemented, existing conditions would persist. The No Action Alternative would not result in any impacts relating to environmental justice.

3.4.3.3 Economic Impacts

Proposed Action

During construction, the region would temporarily benefit from increased jobs and demand for goods and services. The project is not expected to cause any substantial temporary adverse effect to businesses in the project area. Local businesses may benefit from construction worker patronage. Construction-related congestion in the downtown area would be minimized through the preparation and implementation of a traffic control plan. The plan would be prepared by the Contractor for approval by SANDAG and the City of Carlsbad. The Proposed Action is expected to permanently improve commuter rail and intercity train service schedules, improve operational reliability, improve passenger and freight train speed, increase flexibility for freight operations, and provide increased rail capacity in the LOSSAN Rail Corridor. This is expected to improve the economic stability of the region by providing reliable rail transportation alternatives to the passenger car, reducing highway congestion, adding railroad–related employment opportunities and income, and provide additional revenues for the area. Also, additional passenger railroad service would generate additional revenues for the local transportation districts as ridership improves and more individuals choose to utilize the

train as an alternative to the freeways for transportation. Additional freight service would allow for additional imports and exports of goods, which would also permanently benefit the region economically and, theoretically, provide additional tax revenues for the local municipalities in the region.

No Action Alternative

The Proposed Action would involve the continuation of existing conditions. As such, the No Action Alternative would not result in any adverse economic impacts to the community. However, the No Action Alternative would provide none of the beneficial economic impacts associated with the Proposed Action (e.g. potential employment opportunities and increased freight and passenger operation revenues).

3.4.4 Avoidance, Minimization, and/or Mitigation Measures

Because there are no community impacts, economic impacts, or disproportionate impacts on minority/low-income population as a result of the project, no mitigation would be required for the Proposed Action or No Action Alternative.

3.4.5 Impact Analysis of Mitigation Measures

Because there are no community impacts, economic impacts, or disproportionate impacts on minority/low-income population as a result of the project, no mitigation would be required for the Proposed Action or No Action Alternative. Because no mitigation is required, there would be no impact resulting from mitigation.

3.5 Cultural and Historical Resources

The information provided in this section is summarized from the *Cultural and Historical Resources Existing Conditions and Evaluation Report* for the Pacific Surfliner Carlsbad Village Double-Track Project prepared by ASM Affiliates, Inc. (2013). The Cultural and Historical Resources Evaluation Report is provided as Appendix F of this EA.

3.5.1 Regulatory Setting

3.5.1.1 National Historic Preservation Act

The NHPA Section 106 is the primary federal directives for cultural resource preservation and sets forth the national policy and procedures for determining eligibility of "historic properties" for the National Register of Historic Places (NRHP) (36 CFR Part 800). Section 106 requires federal agencies with either direct or indirect jurisdiction over a proposed action to take into account the effect of their actions on historic properties. Section 106 regulations require consultation with a number of interest parties including Native American Tribes. Section 106 also requires federal agencies, and those proposing projects receiving federal funding or approval, to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on undertakings on historic properties, following the procedures established by 36 CFR Part 800.

3.5.2 Affected Environment

3.5.2.1 Direct Effects Areas of Potential Effect

The cultural and historical resources inventory and existing conditions within the direct effects area of potential effect (APE) consisted of a records search and literature review from three databases, Native American correspondence, and an intensive pedestrian field survey. The direct effects APE used for the cultural resources field survey is depicted on Figure 3.5-1 below. The direct effects APE is the area that SANDAG is going to limit the Contractor to for the purpose of construction. The databases utilized for the records search include those of the South Coastal Information Center (SCIC), the San Diego Museum of Man, and the Native American Heritage Commission (NAHC).

The SCIC records search indicated that there are no previously recorded cultural resources within the direct effects APE and only one historic address previously recorded adjacent to the direct effect APE. Additionally, the San Diego Museum of Man and NAHC record searches, as well as Native American correspondence methods, did not identify any cultural resources located within the direct effects APE.

The intensive pedestrian survey was conducted on July 8, 2013 within the direct effects APE and indicated that there are no prehistoric cultural resources located within the Proposed Action area. Only the segment of the railroad alignment and associated railroad features were identified as a cultural resource, as they are a segment of the former Atchison, Topeka and Santa Fe Railroad. (CA-SDI-16385H). While this segment of the Santa Fe Railroad has not been previously recorded in the Proposed Action area, other segments of this railroad have been recorded in San Diego County under the trinomial SDI-16385H/P-37-024739. This resource consists of 1.7 miles of typical single- and double-track railroad that has carried freight and passenger trains continuously since its construction from 1882 to 1885. The railroad segment stretches from MP 228 to MP 229.7 and includes the railroad grade, ballast, rails, ties, switches, spurs, bridge over Buena Vista Lagoon, culverts, a bumper stop, and signage.

Direct Area of Potential Effects (APE)
Indirect Area of Potential Effects (APE)

0 150 300 Meters
0 200 400 800 1,200 Feet

N

1:12,000

SOURCE: ASM Affiliates, 2013

9/12/16

Carlsbad Village Double Track EA

Direct and Indirect APE

FIGURE 3.5-1

3.5.2.2 Indirect Effects APE

The indirect effects APE includes a one parcel buffer around the direct effects APE. The SCIC records search indicated that only one historic address, 400 Carlsbad Village Drive, known as the Carlsbad Santa Fe Depot, was listed in the NRHP in 1993. The Carlsbad Santa Fe Depot was recorded as a Folk Victorian/Carpenter Gothic Style railroad station, in its original location. The station was designed and constructed in 1887 and used as a railroad depot until 1960. The depot was renovated in 1987 and retains its historic integrity. It is currently used as a visitors' center for the City of Carlsbad.

Archival research was conducted to develop a historical context for Carlsbad and Oceanside and resource-specific context for resources within the APE. Additionally, a historic resource field survey was conducted on July 22, 2013 to document historic resources within the indirect effects APE, and all buildings and structures more than 45 years of age were noted and documented. The indirect effects APE used for the cultural resources field survey is depicted on Figure 3.5-1 and is a one parcel buffer surrounding the APE. As a result, the field survey identified and documented 57 historic resources within the indirect effects APE. Of these 57 historic resources, seven are recommended eligible for listing in or are listed in the NRHP, as described in Table 3.5-1 below. Consultation between FRA and SHPO under Section 106 of the NHPA to evaluate these eligibility determinations will be conducted concurrently with public review of this EA. FRA sent a letter dated August 3, 2017 to SHPO initiating the consultation under Section 106. The public may comment on the Proposed Action's effect on historic resources. Each of the seven resources is described in detail below.

Table 3.5-1
Eligible Historic Properties within the Indirect APE

NRHP Site Number	Description	Recommended as Eligible under NRHP Criteria*
NR 93001016	Carlsbad Santa Fe Depot	A, C
N/A	116 Eaton St.	A, C
N/A	1920 S. Broadway St.	A
N/A	417 Carlsbad Village Dr.	A
N/A	457 Carlsbad Village Dr.	A
N/A	3077 State St.	A, C
N/A	3087 State St.	A, C

Source: ASM Affiliates, Inc., 2013.

*NRHP Eligibility Criteria Key: A) Associated with events that have made a significant contribution to the broad patterns of our history; B) Associated with the lives of persons significant in our past; C) Embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; D) Have yielded or may be likely to yield information important in prehistory or history.

Carlsbad Santa Fe Depot

The Carlsbad Santa Fe Depot was listed in the NRHP in 1993. The depot was designed by architect Fred Perris and constructed in 1887. It is eligible at the local level under Criterion A under the areas of significance of transportation, settlement, and commerce with a period of significance from 1887 to 1943. The depot was Carlsbad's first commercial and public building and served as the town's sole depot and railroad stop from 1887 to 1960. Its construction facilitated the establishment and growth of the town. The depot is also eligible under Criterion C for the area of significance of architecture as an example of the meld of Folk Victorian and Carpenter Gothic architecture. It is the only remaining nineteenth-century railroad depot in San Diego County that was constructed in this combination of architectural styles and that remains at its original location.

116 Eaton Street

The residence at 116 Eaton Street is recommended eligible for the NRHP, CRHR, and as an Oceanside Historic Site. Built around 1938, the house is believed to originally have been part of the Saint Malo development, a residential development undertaken in the late 1930s by Pasadena architect and developer Kenyon Keith, and executed in the French Normandie style. Saint Malo was developed as a neighborhood of vacation homes, primarily for wealthy individuals in the financial and entertainment industries of the Los Angeles area. The neighborhood retains excellent integrity in all seven aspects. The Saint Malo neighborhood is significant on the local level for its association with the themes of mid-twentieth century residential development and the tourism industry in Oceanside. It is also an unusual collection of French Normandie style-architecture in Oceanside and in San Diego County.

1920 South Broadway Street

The residence at 1920 South Broadway Street is recommended eligible for the NRHP, CRHR, and as an Oceanside Historic Site. Built around 1934, the house is one of the oldest remaining houses and buildings in this area of Oceanside. As such, it is significant on the local level for its association with the theme of early-twentieth-century residential development of Oceanside. It is a typical example of the restrained construction from the 1930s, and does not embody distinctive characteristics of a type, period, or method of construction that distinguish it architecturally in comparison to similar buildings.

417 Carlsbad Village Drive

The structure at 417 Carlsbad Village Drive is recommended for the NRHP, CRHR, and as a Carlsbad Historic Landmark as a contributor to a potential Carlsbad Downtown Historic District. Downtown Carlsbad is comprised of an excellent collection of commercial structures from the early to mid-twentieth century. The building appears to have been modified to such an extent that it is not a good individual example of late 1930s commercial architecture, and does not embody distinctive characteristics of a type, period, or method of construction that distinguish it architecturally in comparison to similar buildings.

457 Carlsbad Village Drive

The structure at 457 Carlsbad Village Drive is recommended for the NRHP, CRHR, and as a Carlsbad Historic Landmark as a contributor to a potential Carlsbad Downtown Historic District. As discussed above, downtown Carlsbad is comprised of an excellent collection of commercial structures from the early to mid-twentieth century. The building appears to have been modified to such an extent that it is not a good individual example of late 1930s commercial architecture, and does not embody distinctive characteristics of a type, period, or method of construction that distinguish it architecturally in comparison to similar buildings.

3077 State Street

3077 State Street is recommended for the NRHP, CRHR, and as a Carlsbad Historic Landmark as a contributor to a potential Carlsbad Downtown Historic District. As discussed above, downtown Carlsbad is comprised of an excellent collection of commercial structures from the early to mid-twentieth century. The Carlsbad Downtown Historic District is a good collection of early to mid-twentieth century commercial architecture. 3077 State Street retains good integrity and contributes to that aspect of the district's significance.

3087 State Street

3087 State Street is recommended for the NRHP, CRHR, and as a Carlsbad Historic Landmark as a contributor to a potential Carlsbad Downtown Historic District. As discussed above, downtown Carlsbad is comprised of an excellent

collection of commercial structures from the early to mid-twentieth century. The Carlsbad Downtown Historic District is a good collection of early to mid-twentieth century commercial architecture. 3087 State Street retains good integrity, and it contributes to that aspect of the district's significance.

3.5.3 Environmental Consequences

3.5.3.1 Proposed Action

A. Direct Effects

SDI-16385H (Santa Fe Railroad) is the only historic resource located within the direct effect APE. However, the segment of railroad within the direct effect APE was not recommended for NRHP eligibility due to a lack of integrity. Because this segment is not an eligible resource, the Proposed Action would not result in any direct adverse effects.

B. Indirect Effects

Seven historic resources located within the indirect effects APE for the Proposed Action are recommended as eligible: the Carlsbad Santa Fe Depot, four commercial properties in Carlsbad, and two residential properties in Oceanside. These resources were evaluated for potential indirect effects from the Proposed Action.

Visual

The Proposed Action occurs within the existing railroad ROW and would not result in a significant change to the current viewsheds to or from all seven historic resources located within the indirect effects APE. Additionally, the Proposed Action would be compatible with the current viewsheds and would not constitute an obstructive effect. Consequently, the integrity, feeling, and association of these resources would not be significantly altered.

Except for the Carlsbad Santa Fe Depot, views from or towards these resources are not among their character-defining features, nor a quality that contributes to their eligibility. Views of the railroad line from the Carlsbad Santa Fe Depot and towards the Depot from the train could be considered character-defining features. However, the Proposed Action would not constitute an obstructive effect, and thus would not result in adverse impacts on those character-defining features or the historic resource as a whole. Therefore, the Proposed Action would not constitute an adverse indirect visual effect.

Auditory

The effect of noise generated by the Proposed Action must be considered in relationship to the current ambient noise levels at each of the historic resources. As discussed in Section 3.10, Noise and Vibration, of this EA, implementation of the Proposed Action would not result in any adverse operational noise or vibration impacts. The Proposed Action would be located further from the existing receptors. As such, the Proposed Action would not result in any adverse indirect auditory effects.

Vibration

The Carlsbad Santa Fe Depot is located directly along the property line adjacent to the Proposed Action, where heavy construction would be taking place. Because of the nature of the materials of this historic resource, including its character-defining features, it is possible that vibrations generated during construction of the Proposed Action have the

potential to damage some of the historic fabric. Consequently, the Proposed Action has the potential to result in an indirect effect to a historical resource. This construction-related impact is also addressed in Section 3.16.5 and 3.16.10 of this EA (Construction Impacts).

It should be noted that the potential vibration impact would result only from construction of the Proposed Action, not from operational levels. The vibration levels at the Carlsbad Santa Fe Depot site would result in no change with operation of the Proposed Action.

3.5.3.2 No Action Alternative

The No Action Alternative is equivalent to the existing conditions; therefore, no impacts related to cultural resources or historic properties would occur under the No Action Alternative.

3.5.4 Avoidance, Minimization, and/or Mitigation Measures

Although the Proposed Action would not have any operational impacts on cultural resources or historic properties, the Proposed Action has the potential to result in adverse indirect effects on the Carlsbad Santa Fe Depot as a result of vibrations generated during construction. Implementation of Mitigation Measure CHR-1 would minimize the potential for any adverse indirect impacts to the Carlsbad Santa Fe Depot resulting from construction activities.

CHR-1 Vibration measurements at the Carlsbad Santa Fe Historic Depot would be conducted during all construction activities at this location. The Contractor would be required to submit a Vibration Monitoring Plan prepared, stamped, and administered by an acoustical engineer. The Vibration Monitoring Plan would include the vibration instrumentation, location of vibration monitors, data acquisition, and exceedance notification and reporting procedures, as identified in the Noise and Vibration Impact Assessment prepared by ATS Consulting, Inc.

3.5.5 Impact Analysis of Mitigation Measures

Because there would be no operational impacts to cultural resources or historic properties, there is no mitigation required, and no impacts associated with mitigation. Potential construction impacts are discussed in Sections 3.16.5 and 3.16.10 of this EA (Construction Impacts). Mitigation is required in the form of positioning vibration instrumentation to measure and monitor vibrations. The location of the instrumentation will be determined by an acoustical engineer and it is not anticipated that this mitigation measure will have associated impacts.

3.6 Geology/Soils

The information provided in this section is a summary of the information provided in the *Preliminary Foundation Report for the Carlsbad Village Double-Track Carlsbad Village Station Pedestrian Undercrossing*, dated February 4, 2014, and the *Preliminary Foundation Report for the Carlsbad Village Double-Track Buena Vista Lagoon Bridge*, dated February 4, 2014 prepared by Earth Mechanics, Inc. (Appendices G1 and G2, respectively, of this EA) (Earth Mechanics, Inc., 2014a and 2014b).

3.6.1 Regulatory Setting

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act (EHRA) (Public Law 95-124) established the National Earthquake Hazards Reduction Program (NEHRP) as a long-term earthquake risk reduction program for the United States. The program initially focused on research, led by the U.S. Geological Survey (USGS) and National Science Foundation (NSF), toward understanding and ultimately predicting earthquakes.

U.S. Geological Survey Landslide Hazard Program

The USGS created the Landslide Hazard Program (LHP) in fulfillment of the requirements of Public Law 106-113. The primary objective of the LHP is to reduce long-term losses from landslide hazards by improving the understanding of the causes of ground failure and suggesting mitigation strategies. The federal government takes the lead role in funding and conducting this research, whereas the reduction of losses due to geologic hazards is primarily a state and local responsibility.

3.6.2 Affected Environment

3.6.2.1 Geologic Setting

The Proposed Action is located within the western portion of the Peninsular Ranges Physiographic Province, which comprises ranges and valleys extending southeasterly from the Los Angeles-San Bernardino region to the Baja Peninsula in Mexico, between the San Andreas Fault on the east and the Pacific Ocean. According to the County of San Diego, the project site is also located within the Coastal Plains Physiographic Province. The Coastal Plain region, ranging from approximately 1 to 12 miles wide, is bounded by the Pacific Ocean to the west, and the Peninsular Ranges to the east. It is characterized by broad, planar mesas gently sloping to the west, incised by deep canyons. The Peninsular Ranges are a group of northwest-southeast trending mountains and valleys between the San Andreas Fault on the east and the offshore area called the Continental Borderland. Bedrock in the Peninsular Ranges is predominantly composed of Mesozoic-age granitics. The region surrounding San Diego, including the offshore Continental Borderland area, is transected by a series of long, mostly northwest-trending, strike-slip fault systems. The site is within a series of relatively flat terraces immediately inland from the beach.

The coastal terraces are dissected by westerly flowing streams, most of which are under tidal influences near the coast forming broad tidal flats and estuaries. The proposed improvements extend along the coastal terraces and across the Buena Vista Lagoon.

The site is underlain by a thick section of young to old alluvial paralic deposits which consist of gray medium dense to dense sands intertongued with dark gray, soft to stiff silts and clays. The marine and continental paralic deposits are associated estuarine/lagoonal, alluvial, and littoral depositional environments. These deposits form a deep basin underneath the Buena Vista Lagoon.

The old paralic deposits are mantled by the Santiago Formation, which consists of poorly indurated, grey to brownish grey, silty fine-grained sandstone. The Santiago Formation also consists of interbeds and lenses of siltstone and claystone.

3.6.2.2 Subsurface Conditions

In 2013, geotechnical investigations were conducted by Earth Mechanics, Inc., at two separate segments of the Proposed Action. Firstly, a geotechnical investigation consisting of three rotary wash borings was conducted near the abutments of the existing Buena Vista Lagoon Bridge, referred to as the "Lagoon Segment." Secondly, a geotechnical investigation consisting of two hollow-stem auger borings was conducted at the site of the proposed Carlsbad Village Station Pedestrian Undercrossing, referred to as the "Village Segment." The purpose of the borings was to determine subsurface conditions and collect soil samples in areas of proposed improvements associated with the Proposed Action. The findings of each of these geotechnical investigations are further described below and are summarized from the Preliminary Foundation Reports prepared by Earth Mechanics, Inc. (Appendices G1 and G2 of this EA).

Lagoon Segment

Borings R-13-01 and R-13-03 were performed on the access road to the east of the existing northern bridge abutment in October and November 2013. Boring R-13-01 was performed in October over a period of two days and was only able to be advanced to a depth of 60 feet due to repeated loss of drill fluid and hole collapse. Boring R-13-03 was performed in November also over a period of two days and was located approximately 10 feet north of boring R-13-01. R-13-03 was advanced to a depth of 110 feet, though fluid loss and hole collapse was also experienced.

Boring R-13-02 was performed in January of 2013 in the railroad gauge near the existing southern bridge abutment. Similar problems occurred with hole caving and fluid loss as those described above for Boring R-13-02. However, over a two-day period, the boring was able to be advanced down to a depth of about 130 feet below existing grade. Soil boring information including boring number, approximate location, approximate ground surface elevation and bottom of boring elevation is summarized in Table 3.6-1.

Village Segment

Boring A-13-03 was performed at an access road west of the existing tracks at the corner of Washington Street and Beech Street. Boring A-13-04 was performed in a parking lot on the east side of the existing tracks directly across from Boring A-13-03. Soil boring information including boring number, approximate location, approximate ground surface elevation and bottom of boring elevation is summarized in Table 3.6-2.

Table 3.6-1
Summary of Soil Borings (Lagoon Segment)

Boring No.	Approximate Station along MT1 Track (ft)	Approximate Ground Surface Elevation (ft)	Approximate Bottom of Hole Elevation (ft)	Approximate Groundwater Elevation (ft)
R-13-01(1)	STA 2096+06, 12ft LT	+8.2	-51.8	+5
R-13-02(2)	STA 2073+00, 20ft RT	+15.5	-114.5	+5
R-13-03(3)	STA 2068+96, 15ft RT	+8.2	-101.8	+5

Notes: (1) Boring station, offset and elevations surveyed by Rick Engineering.
(2) Boring station, offset and elevation approximate based on field measurement from boring R-13-01.
(3) Horizontal Datum: CCS83, Vertical Datum: NGVD29
STA: Station, LT: left, RT: right.
Source: Earth Mechanics, Inc., 2014b.

Table 3.6-2
Summary of Soil Borings (Village Segment)

Boring No.	Approximate Station along MT1 Track (ft)	Approximate Ground Surface Elevation (ft)	Approximate Bottom of Hole Elevation (ft)	Approximate Groundwater Elevation (ft)
A-13-03	STA 2093+87, 40 ft RT	+39.0	-21.9	+12.0
A-13-04	STA 2094+05, 59 ft LT	+36.5	-44.9	+14.8

Notes: Boring station, offset and elevations surveyed by Rick Engineering.
STA: Station, LT: left, RT: right.
Source: Earth Mechanics, Inc., 2014a.

3.6.2.3 Groundwater

Lagoon Segment

Groundwater was encountered in all three of the borings at approximate elevation +5 feet, similar to the water level in the Buena Vista Lagoon. The lagoon is currently protected from tidal influence by an existing weir at its west end where it outlets to the Pacific Ocean. However, the Buena Vista Lagoon is proposed for restoration in the future and the bridge could potentially be subject to tidal influence following the restoration. For preliminary design purposes, a conservative design groundwater elevation of +8 feet coincident with high tide was used in the analysis.

During drilling for all three borings, signs of artesian groundwater were encountered below about elevation -90 feet. An approximately 10 foot thick fat clay layer was encountered between about elevation -80 and -90 feet that currently serves as a confining layer (aquatard) retarding vertical flow of pressurized water. Based on the conditions encountered during drilling, groundwater in the layer below the aquatard is estimated to have a pressurized water head about 10 feet above the static water table.

Village Segment

Groundwater was encountered in both borings between elevations +12 feet and +15 feet. For preliminary design purposes, a design groundwater elevation of +16.5 feet was used in the analysis.

3.6.2.4 Soils

Laboratory tests were performed to determine relevant physical characteristics and engineering properties of soils that exist at the site. Selected soil samples were tested to determine soil classification, physical and engineering properties. A list of tests performed, the corresponding test method, and purpose of testing is presented in Table 3.6-3.

Table 3.6-3
Soil Sample Laboratory Tests Performed

Type of Test	Applicable Test Method	Purpose
Dry Density	ASTM[1] D 2937	Estimate in-situ soil density
Moisture Content	ASTM D 2216	Estimate in-situ soil moisture content
No. 200 Wash	ASTM D 1140	Estimate percentage of fine grained particles of soil
Atterberg Limits	ASTM D 4318	Estimate plasticity of fine grained soil
Soil pH	CT[2] 532/643	Estimate corrosion potential of site soil
Minimum Resistivity	CT 532/647	Estimate corrosion potential of site soil
Sulfate Content	CT 417	Estimate corrosion potential of site soil
Chloride Content	CT 422	Estimate corrosion potential of site soil

Notes: [1] ASTM = American Society for Testing and Materials
[2] CT = California Test Method
Source: Earth Mechanics, Inc., 2014a and 2014b.

The laboratory soil tests were conducted in general accordance with California Test (CT) methods or American Society for Testing and Materials (ASTM) standards. The locations where tests were performed for each segment are shown in their respective *Preliminary Foundation Reports*.

Lagoon Segment

Site soils of the Lagoon Segment consist of a thick layer of coarse-grained alluvial marine sediments from the ground surface to a depth of about 90 feet below grade. The upper 20 to 30 feet of the layer consists of medium dense potentially liquefiable silty sand and sand with silt. Below about 30 feet below grade the consistency of the soils become medium dense to dense. The surficial sandy layer is underlain by an approximately 10 foot thick, stiff, fat clay layer. The fat clay layer is underlain by clayey sand to the deepest depths explored.

The fat clay layer lying between about elevation -80 and -90 feet appears to be serving as an aquatard confining pressurized groundwater below about elevation -90 feet. Blow counts in the coarse-grained clayey sand below the clay layer indicate that the material is loose to medium dense and potentially liquefiable. However, the pressurized aquifer very likely caused a “quick” condition in the borings resulting in low penetration blow counts that are not representative of the soils in-situ density.

Based on information collected from the borings described under Section 3.6.2.2, Subsurface Conditions, an idealized soil profile was developed at the site. The soil profile and design strength parameters are presented in Table 3.6-4. The cohesion values for clayey soils and shear strength parameters for sandy soils were estimated using laboratory test data and correlations between field blow count and shear strength.

Village Segment

Site soils of the Village Segment consist of about 15-20 feet of very dense silty and clayey sand and very stiff to hard clay, underlain by very dense silty sand.

Table 3.6-4
Idealized Soil Profile and Strength Parameters (Lagoon Segment)

Approximate Elevation (ft)	Predominant Soil Type	Range of SPT blow counts – (N_{60}) (blows/ft)	Total Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degree)
+15 to -25	Sand with Silt/Silty Sand	5 – (46)[1] Avg = 20	115	100	30
-25 to -52	Silty Sand/Sand with Silt	12 – 75 Avg = 47	120	0	35
-52 to -78	Silty Sand/Sand with Silt	20 – 77 Avg = 39	120	0	33
-78 to -88	Lean to Fat Clay	10 – 17 Avg = 13	120	1500	0
-88 to -115	Clayey Sand	15[2] – 21[2] Avg = 19[2]	120	0	30

Notes: [1] Values in ( ) are California Modified sampler blow counts converted to equivalent Standard Penetration Test (SPT) blow counts using a sampler size correction factor of 0.67.
[2] In-situ density of coarse-grained soils in pressurized aquifers expected to be greater than indicated by penetration blow counts.
ft: feet, pcf: pound per cubic foot, psf: pound per square foot.
Source: Earth Mechanics, Inc., 2014b.

Based on information collected from the borings described under Section 3.6.2.2, Subsurface Conditions, an idealized soil profile was developed at the site. The soil profile and design strength parameters are presented in Table 3.6-5. The shear strength parameters for sandy soils were estimated using correlations between field blow counts and shear strength.

Table 3.6-5
Idealized Soil Profile and Strength Parameters (Village Segment)

Approximate Elevation (ft)	Predominant Soil Type	Range of SPT blow counts – (N60) (blows/ft)	Total Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degree)
+36.5 to +16.5	Silty Sand/Clayey Sand/Fat Clay	(27)[1] to >50 Avg = >50	120	0	34
+16.5 to -44.9	Silty Sand/Sandy Lean Clay	>50	120	0	38

Notes: [1] Values in ( ) are California Modified sampler blow counts converted to equivalent SPT blow counts using a sampler size correction factor of 0.67.
ft: feet, pcf: pound per cubic foot, psf: pound per square foot.
Source: Earth Mechanics, Inc., 2014a.

3.6.2.5 Faulting, Seismicity and Associated Geologic Hazards

The Proposed Action is located in seismically active southern California and is subject to shaking from both local and distant earthquakes. The possibility of large seismic events on the nearby Newport Inglewood – Rose Canyon fault zone would control seismic design of the project. Based on the as-builts for the existing bridge, which show the design as of 1984, it is unlikely that the existing bridge meets the current seismic design criteria, particularly in relation to the requirements for liquefaction. However, that is not an indication that the bridge is not seismically safe. Table 3.6-6 lists the nearest active faults, fault type and their maximum earthquake magnitude according to the Caltrans Fault Database. The distances from the Proposed Action to each fault were determined using the Caltrans ARS Online web tool V2.2.06.

Table 3.6-6
Project Area Fault Data

Fault	Fault Type	Maximum Earthquake Magnitude	Distance from Site to Fault (miles)	Surface Fault/Blind Fault
Rose Canyon fault zone (Oceanside section)	*RLSS*	*6.8*	*4.6*	*Surface*
Newport Inglewood (Offshore)	*RLSS*	*6.9*	*5.5*	*Surface*
Rose Canyon fault zone (Del Mar section)	*RLSS*	*6.8*	*8.9*	*Surface*

Notes: RLSS = Right Lateral Strike Slip
Source: Earth Mechanics, Inc., 2014a and 2014b.

No major faults are known to extend through the site area so the potential for surface rupture is considered low. In addition, no Alquist-Priolo Earthquake Fault Zones have been designated in the project area by the California Department of Conservation's Division of Mines and Geology.

Seismic Design Criteria

It is likely that the seismic design of both the Buena Vista Lagoon Bridge and the Pedestrian Undercrossing would be based on the American Railway Engineering and Maintenance-of-way Association (AREMA) Manual.

Utilizing AREMA methodology, three levels of seismic risk are considered in design. Per the 2013 Manual for Railway Engineering, the conservative return periods of the design seismic event correspond to the 100-year, the 500-year, and the 2,400-year seismic events. These events correspond to the bridge performance criteria for the Serviceability, Ultimate, and Survivability Limit States, respectively.

The Base Acceleration Coefficients (A_R) were estimated based on data from the 2008 USGS National Seismic Hazard Map, for the 100-year, 500-year, and 2400-year return period earthquakes. The Site Coefficient (S) was estimated based on the soil conditions of the project site and AREMA manual. The acceleration response spectral (ARS) curve design parameters are presented in Table 3.6-7.

Table 3.6-7
Geotechnical Input for AREMA (2013) ARS Curve

Earthquake Return Period (yrs.)	Service Level	Base Acceleration Coefficient (A_R)		Site Coefficient (S)	
		Lagoon	Village	Lagoon	Village
100	*Serviceability*	*0.149*	*0.132*	*1.2*	*1.0*
500	*Ultimate*	*0.276*	*0.259*		
2,400	*Survivability*	*0.477*	*0.483*		

Source: Earth Mechanics, Inc., 2014a and 2014b.

Lagoon Segment

Liquefaction and Seismically Induced Settlement

In general, the material in the upper 20 feet below groundwater (above Elevation -15 feet) is considered potentially liquefiable during the Serviceability and Ultimate seismic events. During the Survivability seismic event, an additional 10 feet of material between about elevation -15 and -25 feet is considered potentially liquefiable. Settlement on the

order of a few inches is expected during the Serviceability and Ultimate seismic events with several inches of settlement anticipated during the Ultimate seismic event.

Seismic Slope Instability

The "global" stability of the banks of the Buena Vista Lagoon near the proposed abutments was evaluated for the pseudo-static condition. The horizontal ground acceleration equal to one third (1/3) of the peak ground acceleration for each level earthquake was used in the analysis. The residual shear strength of liquefiable soils was estimated. The material used for the proposed fill behind the abutments was assumed to have a friction angle of 30 degrees and minimum cohesion of 100 psf.

Village Segment

Liquefaction and Seismically Induced Settlement

Based on the site-specific geotechnical investigation, the coarse grained soils were found to be very dense. Due to the very dense nature of the coarse-grained site soils the liquefaction potential of site soils is considered low. In addition, seismically induced settlement of dry and partially saturated soils due to strong shaking is expected to be negligible due to the predominately very dense nature of the on-site soils.

Seismic Slope Instability

Since liquefaction is not expected to be an issue for the native deposits, site soils are not expected to suffer significant loss of strength during design earthquakes. Therefore, any cut slopes around the structure are expected to be stable during design earthquakes.

3.6.3 Environmental Consequences

3.6.3.1 Proposed Action

Lagoon Segment

Groundwater

As previously mentioned, groundwater was encountered in all three of the borings at approximate elevation +5 feet, similar to the water level in the Buena Vista Lagoon. During drilling for all three borings, signs of artesian groundwater were encountered below about elevation -90 feet. An approximately 10-foot thick fat clay layer was encountered between about elevation -80 and -90 feet that currently serves as a confining layer (aquatard) retarding vertical flow of pressurized water. Based on the conditions encountered during drilling, groundwater in the layer below the aquatard is estimated to have a pressurized water head about 10 feet above the static water table. The artesian condition would need to be investigated further and quantified in a future geotechnical investigation as it could present construction issues for the proposed replacement structure foundation. As such, potential impacts associated with groundwater would be considered adverse. However, with implementation of Mitigation Measure GS-1 (refer to Section 3.6.4), it is anticipated that impacts would be reduced to a negligible level.

In addition, groundwater monitoring wells are recommended to be installed as part of a supplemental geotechnical investigation performed during final design to provide the contractors with the necessary information to determine the appropriate Cast-In-Drilled-Hole (CIDH) pile excavation methods.

Soils

As previously mentioned, site soils of the Lagoon Segment consist of a thick layer of coarse-grained alluvial marine sediments from the ground surface to a depth of about 90 feet below grade. The upper 20 to 30 feet of the layer consists of medium dense potentially liquefiable silty sand and sand with silt. Below about 30 feet below grade the consistency of the soils become medium dense to dense. The surficial sandy layer is underlain by an approximately 10 foot thick, stiff, fat clay layer. The fat clay layer is underlain by clayey sand to the deepest depths explored.

Samples representative of soils throughout the project area were tested to determine corrosivity including minimum resistivity, pH, soluble sulfate content, and soluble chloride content. Two soil samples were tested for corrosivity. The minimum resistivity ranged from 35 to 860 ohm-cm. The pH ranged from 6.95 to 7.38. The soluble sulfate ranged from 180 to 1,100 ppm, and the soluble chloride ranged from 525 to 12,454 ppm.

According to Caltrans criteria (Corrosion Guidelines V2.0, 2012), soils are considered corrosive if the pH is 5.5 or less, or sulfate concentration is 2,000 ppm or greater, or chloride concentration is 500 ppm or greater. Based on these test results and Caltrans criteria, the on-site soils of the Lagoon Segment are classified to be corrosive. As such, potential impacts associated with corrosive soils would be considered adverse. However, implementation of Mitigation Measure GS-3 (Section 3.6.4), it is anticipated that impacts associated with corrosive soils would be reduced to a negligible level.

Faulting and Seismicity

No major faults are known to extend through the site area so the potential for surface rupture is considered low. In addition, no Alquist-Priolo Earthquake Fault Zones have been designated in the project area by the California Department of Conservation's Division of Mines and Geology. However, the Proposed Action is located in seismically active southern California and would be subject to shaking from both local and distant earthquakes. The possibility of large seismic events on the nearby Newport Inglewood – Rose Canyon fault zone would have the potential to result in adverse impacts to the project site. As previously stated, it is unlikely that the existing bridge meets the current seismic design criteria, particularly in relation to the requirements for liquefaction. However, the Proposed Action includes the replacement of the existing Buena Vista Lagoon Bridge, and the seismic design of the proposed bridge would be required to incorporate the seismic design criteria provided in the AREMA Manual pursuant to 49 CFR 237.

In addition, the global stability of the banks of the Buena Vista Lagoon near the proposed abutments was evaluated for the pseudo-static condition. Based on the results of the preliminary pseudo-static analysis, lateral movement of the approach embankment towards the Buena Vista Lagoon is anticipated to be negligible during all three design seismic events. Therefore, there would be no adverse impacts associated with faulting and seismicity in the Lagoon Segment.

Liquefaction and Seismically Induced Settlement

The near surface marine and estuary deposits were observed to be loose to medium dense and potentially liquefiable; therefore, spread footings are not recommended for support of the replacement structure. In general, the material in the upper 20 feet below groundwater (above Elevation -15 feet) is considered potentially liquefiable during the Serviceability and Ultimate seismic events. During the Survivability seismic event, an additional 10 feet of material between about elevation -15 and -25 feet is considered potentially liquefiable. Settlement on the order of a few inches is expected during the Serviceability and Ultimate seismic events with several inches of settlement anticipated during the Ultimate seismic event. As such, potential impacts would be considered adverse. However, with implementation of Mitigation Measures GS-1 and GS-2 (see Section 3.6.4), it is anticipated that impacts associated with liquefaction and seismically induced settlement would be reduced to a negligible level.

Scour Potential

Under existing conditions, the Buena Vista Lagoon is protected from tidal influence by a beach berm and a weir, located at the lagoon mouth (SANDAG, 2013d). The existing bridge is founded on piles without a pile cap, which are used to protect bridge pilings from scour damage. As such, there are no existing significant issues with scour which would impact the existing bridge. However, a complete scour evaluation is currently being conducted as part of the Buena Vista Lagoon Enhancement Project. The enhancement project is evaluating four potential alternatives: freshwater enhancement, saltwater enhancement, a hybrid enhancement containing both freshwater and saltwater, and a no project alternative. The scour potential of either restoration alternative is expected to increase over the current configuration. The results of the scour analysis would be incorporated into the geotechnical recommendations during final design.

For preliminary pseudo-static global stability analysis and seismic pile analyses, long term scour was considered negligible and local scour was not considered due to the unlikelihood that the maximum design earthquake and the maximum design flood would be experienced concurrently. Therefore, there would be no adverse impacts to the Lagoon Segment associated with potential scour.

Village Segment

Groundwater

As previously discussed, groundwater was encountered in both borings between elevations +12 feet and +15 feet. However, it is not anticipated that implementation of the Proposed Action would result in any adverse impacts associated groundwater. Therefore, no impacts associated with groundwater have been identified for the Village Segment.

Soils

As previously discussed, site soils of the Village Segment consist of about 15-20 feet of very dense silty and clayey sand and very stiff to hard clay, underlain by very dense silty sand. Both abutments and interior supports for the proposed structure are anticipated to be embedded in native soils. Based upon the site-specific field investigation, native soils are anticipated to be suitable for support of the proposed structure on spread footings. However, due to the space limitations for footing construction next to live tracks, spread footings would require extra work windows to construct; therefore, deep foundations are preferred.

In addition, samples representative of soils throughout the project area were tested to determine corrosivity including minimum resistivity, pH, soluble sulfate content, and soluble chloride content. Two soil samples were tested for corrosivity. The minimum resistivity ranged from 990 to 1,900 ohm-cm. The pH ranged from 8.1 to 9.0. The soluble sulfate ranged from 160 to 300 ppm, and the soluble chloride ranged from 144 to 160 ppm.

According to Caltrans criteria (Corrosion Guidelines V2.0, 2012), soils are considered corrosive if the pH is 5.5 or less, or sulfate concentration is 2,000 ppm or greater, or chloride concentration is 500 ppm or greater. Based on these test results and Caltrans criteria, the on-site soils of the Village Segment are classified to be non-corrosive. Therefore, there would be no impacts associated with corrosive soils.

Faulting and Seismicity

No major faults are known to extend through the site area so the potential for surface rupture is considered low. In addition, no Alquist-Priolo Earthquake Fault Zones have been designated in the project area by the California Department of Conservation's Division of Mines and Geology. However, the Proposed Action is located in seismically active southern California and would be subject to shaking from both local and distant earthquakes. The possibility of large seismic events on the nearby Newport Inglewood – Rose Canyon fault zone would have the potential to result in adverse impacts to the project site. However, the seismic design of the proposed Pedestrian Undercrossing would be required to incorporate the seismic building design criteria provided in the NEHRP Recommended Seismic Provisions Manual pursuant to the provisions of the EHRA.

Since liquefaction is not expected to be an issue for the native deposits, site soils are not expected to suffer significant loss of strength during design earthquakes. Therefore, any cut slopes around the structure are expected to be stable during design earthquakes. As such, there would be no adverse impacts associated with faulting and seismicity for the Village Segment.

Liquefaction and Seismically Induced Settlement

Based on the site-specific geotechnical investigation, the coarse grained soils were found to be very dense. Due to the very dense nature of the coarse-grained site soils the liquefaction potential of site soils is considered low. In addition, seismically induced settlement of dry and partially saturated soils due to strong shaking is expected to be negligible due to the predominately very dense nature of the on-site soils. Therefore, liquefaction and seismically induced settlement are not expected to impact the proposed bridge foundation.

Scour Potential

The Carlsbad Village Station Pedestrian Undercrossing does not cross a waterway and therefore scour potential is not considered a design constraint.

3.6.3.2 No Action Alternative

Under the No Action Alternative, the proposed double-track would not be constructed and the existing single-track would remain along this segment of the LOSSAN corridor. As such, the existing geology and soils would remain as they exist today, and no impacts would occur. Therefore, implementation of the No Action Alternative would have no impacts to geology and soils.

3.6.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Proposed Action has the potential to result in adverse impacts to geology and soils in the Lagoon Segment. As such, SANDAG would implement the following mitigation measures to reduce adverse impacts to geology and soils to a negligible level.

GS-1 Following bridge type selection, a supplemental geotechnical field investigation would be performed once the final foundation type has been determined. The supplemental investigation would include one geotechnical boring near the northern abutment that would be converted over to a monitoring well at the completion of the boring to record groundwater pressures. A set of fully grouted vibrating wire piezometers would be installed at a location that could be protected through design and construction. Properly located, the piezometers would be used by SANDAG and the Contractor to determine the groundwater conditions prior and continuously throughout construction to determine necessary measures in the Cast-In-Drilled-Hole (CIDH) pile installation plan and to resolve potential differing site condition claims.

GS-2 A Cone Penetration Test (CPT) sounding near the northern abutment would be performed, as needed, for the Designer to evaluate the in-situ density of the soils within the pressurized aquifer and to provide continuous information throughout the profile to further evaluate the liquefaction potential of material that were identified as potentially liquefiable.

GS-3 Soil corrosivity issues will be addressed in conformance with AREMA during subsequent design efforts by the Designer. Possible mitigation measures would include increased cover for reinforcing steel and corrosion resistant cement (for concrete piles), and sacrificial steel would be provided for steel surfaces in contact with site soils.

In order to avoid and/or minimize any impacts to geology and soils, pursuant to the EHRA and the USGS LHP in fulfillment of the requirements of Public Law 106-113, SANDAG would implement the following avoidance and minimization measure to protect geology and soils both during design and during construction of the Proposed Action, and would reduce any potential impacts to a negligible level.

GS-4 All future grading and construction of the project site by the Contractor would comply with the geotechnical recommendations contained in the Preliminary Foundation Reports prepared for the Carlsbad Village Station Pedestrian Undercrossing and the Buena Vista Lagoon Bridge (Earth Mechanics, Inc., 2014a and 2014b). These reports identify specific geotechnical recommendations that would be implemented during the design and construction of the project.

3.6.5 Impact Analysis of Mitigation Measures

Implementation of Mitigation Measures GS-1 and GS-2 would include geotechnical recommendations that may involve boring, installation of piezometers and a CPT. However, these mitigation measures would be conducted by professional personnel and would follow procedures established during the initial geology and soils studies. Therefore, it is not anticipated that there will be adverse impacts associated with mitigation implementation.

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3.7 Hazardous Materials/Hazardous Waste

The information provided in this section is summarized from the *Phase I Environmental Site Assessment, Pacific Surfliner Carlsbad Village Double-Track Project* prepared by St. George Chadux Corp. (2013). The Environmental Site Assessment is provided as Appendix H of this EA.

3.7.1 Regulatory Setting

3.7.1.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) is a U.S. law that provides the general guidelines for the waste management program. It includes a Congressional mandate directing the EPA to develop a comprehensive set of regulations to implement the law. The hazardous waste program, under RCRA Subtitle C, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal – in effect, from "cradle to grave" (EPA, 2012a).

3.7.1.2 Clean Water Act

The CWA is the principal statute governing water quality and established the basic framework for regulating the discharge of pollutants into the nation's waters, a permit system known as the NPDES. The EPA is given the authority to implement pollution control programs. The NPDES program requires permits for the discharge of pollutants from any point source (including stormwater discharges) into WoUS. As defined in the CWA, WoUS applies only to surface waters, rivers, lakes, estuaries, coastal waters, and wetlands. The authority to implement the NPDES program is generally delegated to individual States.

3.7.1.3 Clean Air Act

The CAA contains key provisions to protect public health and welfare from different types of air pollution caused by a diverse array of pollution sources. The CAA also contains specific provisions to address "hazardous" or "toxic" air pollutants that pose health risks such as cancer or environmental threats such as bioaccumulation of heavy metals (EPA, 2013a).

3.7.1.4 Comprehensive Environmental Response, Compensation, & Liability Act

The Comprehensive Environmental Response, Compensation, & Liability Act (CERCLA), commonly known as Superfund, created a tax on the chemical and petroleum industries and provided broad Federal authority to respond directly to releases of threatened releases of hazardous substances that may endanger public health or the environment (EPA, 2011a).

3.7.1.5 Superfund Amendments & Reauthorization Act

The Superfund Amendments & Reauthorization Act (SARA) amended CERCLA on October 17, 1986, making several important changes reflecting the EPA's experience in administering the Superfund program in its first six years. SARA increased focus on human health problems associated with hazardous waste, permanent and innovative technologies for cleaning up hazardous waste sites, and required the EPA to revise the Hazard Ranking System (HRS) (EPA, 2011b).

3.7.1.6 Federal Insecticide, Fungicide, & Rodenticide Act

The Federal Insecticide, Fungicide, & Rodenticide Act (FIFRA) mandates that the EPA regulate the use and sale of pesticides to protect human health and preserve the environment (EPA, 2012b).

3.1.7.7 Hazardous Materials Transportation Act

The Hazardous Material Transportation Act (HMTA) provides for adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce by improving the regulatory and enforcement authority of the Secretary of Transportation. The Secretary of Transportation defines a hazardous material as any "particular quantity or form" of a material that "may pose an unreasonable risk to health and safety or property" (EPA, 2011c)

3.7.1.8 Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of American's drinking water. Under SDWA, the EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards (EPA, 2012c).

3.7.1.9 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) provides the EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. The TSCA addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyl (PCB), asbestos, radon, and lead-based paint (EPA, 2013b).

3.7.2 Affected Environment

The Phase I Environmental Site Assessment (ESA) conducted by St. George Chadux Corporation is intended for use in identifying, to the extent feasible, recognized environmental conditions (REC) in connection with the Proposed Action (described below as the "subject property"). The assessment included a site inspection and research of public and regulatory agency databases. Formal interviews were not conducted as part of the ESA. Additionally, the scope of work for the ESA was in general accordance with the ASTM Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM Designation: E1527-05). The ASTM defines a REC as "the presence of or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis conditions* (DMC) that generally do not present a material risk to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies."

The project impact area, referred to as the subject property in this section, is located within the existing NCTD ROW along the LOSSAN rail corridor (Figure 2-1). From review of databases and applicable files, the subject property has been used as a single-track railway, including a single-track bridge over Buena Vista Lagoon, since the 1880's. Associated buildings include the Carlsbad Village Station and the former Santa Fe Train Station, (now the Carlsbad Convention & Visitors Bureau). The NCTD operates a storage yard on the subject property. In addition, two electrical switching stations are located on the subject property, with one on each of the northern and southern boundary. Three

separate active construction sites were observed within 0.25 miles of the subject property, with one construction site directly adjacent to the subject property. The subject property was not listed in any of the environmental databases.

3.7.2.1 On-Site Findings

General Housekeeping Practices

General housekeeping (day-to-day environmental management practices such as site upkeep and maintenance) was found to be fair throughout the subject property. Debris observed during the inspection included items used by transients, broken concrete containing rebar, and a discarded concrete block with an attached weathered electrical box. Based on visual inspection of the broken concrete, it did not appear to contain transite, which is an asbestos-cement product. An apparent oil sheen (petroleum product with iridescent color) was noted in the surface water of the Buena Vista Lagoon at the northeast corner of the single-track bridge, and was primarily in the reeds. Although there was no obvious source identified, the oil could have potentially originated from illegal dumping from the bank of the lagoon, or from motorized watercraft. However, the oil sheen is not believed to be part of a larger plume, and thus represents a DMC. Furthermore, there was no evidence of soil staining, standing liquids, stressed vegetation, or PCB transformers observed on the property.

Vegetation

The property supports a variety of vegetation, including ice plant, wetland vegetation, and a mixture of grasses, weeds, and shrubs. Areas around the main station and Visitors Bureau and adjacent areas are actively landscaped, weeded, and irrigated. Herbicides or pesticides were observed being applied to landscaped areas around the Carlsbad Village Station, and are assumed to also be applied to landscaped areas at the Visitors Bureau and two parks.

Buildings and Structures

Two buildings are located on the subject property. The Carlsbad Village Station, built in 1995, is one story and is made of concrete and wood. Based on the age of the building, neither asbestos containing materials (ACM) nor lead-based paint is suspected. The Carlsbad Convention & Visitors Bureau, built in 1887, is a two-story structure made of wood. Though not observed, based on the age of the building, ACM and/or lead-based paint may be present. Visual inspection of the exterior of the building indicated a recent application of paint in good condition that would not indicate a lead-based paint exterior coat. In addition, the two electrical switching stations structures did not show any signs of contaminant release.

Historic Uses

Based on the historic use of the subject property as an active rail line since the 1880s, there are potential RECs that could exist on the subject property. The following constituents may be present based on the historic use of the subject property:

Creosote, a wood preservative compound made from distilled coal tar that may have been applied to the railroad ties and wooden bridge elements.

Heavy metals, such as arsenic, may have been used in herbicides applied in the ballasts or used in wood preservatives. Similarly, lead may be present from fuel combustion products.

Petroleum based compounds, such as polycyclic aromatic hydrocarbons (PAH), diesel range organics, hydraulic fluids, and degreasing solvents, may be present due to small repetitive leaks over time from the passing trains and fuel combustion products.

Other non-metal herbicide compounds may have been previously applied to ballasts.

Environmental Conditions of Concern Not Present

A number of additional environmental conditions of concern were evaluated in the ESA for potential presence on the subject property, but were not observed to be present:

- Hazardous material storage, use, and handling;
- Spill and stain areas;
- PCBs;
- Underground and aboveground storage tanks;
- Friable and non-friable suspect asbestos containing materials;
- Landfills ;
- Pits or ponds;
- Radon;
- Solid waste disposal;
- Process wastewater disposal; and,
- Potable water/wells and cisterns.

3.7.2.2 Off-Site Findings

Active Construction Sites

Three active construction sites were observed within the vicinity of the property, however only the Army Navy Academy campus is located directly adjacent to the subject property. Heavy equipment was observed at the site. No refueling station or tanks were observed at the construction site. Due to the presence of heavy machinery, it is possible that petroleum products may leak from the machines and onto the surface soil. However, based on observations, there is no evidence suggesting that hazardous contaminants were released from current construction activities.

Hazardous Sites Database Searches

A records review of federal, state, and local regulatory agency databases was also used to evaluate environmental conditions of potential concern with the subject property and surrounding properties within a 1-mile radius. Within the 1-mile radius of the subject property, the database search revealed one State-equivalent National Priorities List site, two Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) properties, 13 properties identified as either a RCRA Large Quantity Generator (LQG) or a Small Quantity Generator (SQG), two Emergency Response Notification System (ERNS) sites, and one solid waste disposal site. However, based on the location and status of these sites, they do not pose a significant REC to the subject property. Additionally, a review of

the Leaking Underground Storage Tank (LUST) list revealed that there are 44 LUST sites within 0.5 miles of the subject property. Of the 44 sites identified, two were determined to pose a potential REC to the subject property because of their open status, reported releases, and location in relation to the subject property: Regent (currently Liberty Oil, Inc.) and Econo Lube N Tune (formerly Chevron Service Station No. 9-6978).

Regent (1943 S. Coast Highway, Oceanside, CA) – Formerly Golden State Service Station, the cleanup status of this facility is listed as "Open-Site Assessment as of 12/18/2009." Petroleum hydrocarbon-impacted soil was observed in 1986. Analytical results from 2012 indicated that the dissolved gasoline plume has migrated at least 875 feet southwest of the source.

Econo Lube N Tune (1942 S. Coast Highway, Oceanside, CA) – The cleanup status of this facility is listed as "Open-Remediation as of 12/26/2001." Total petroleum hydrocarbons as gasoline (TPH-g) and benzene were detected in a groundwater sample in 1998. In 2009, free product sample was detected in one monitoring well. Additionally, many of the groundwater samples collected from site monitoring wells in March 2013 contained detectable dissolved-phase hydrocarbon concentrations above their respective laboratory method detection limits.

3.7.3 Environmental Consequences

Proposed Action

Common contaminants found along railroad corridors include creosote from treated wood railroad ties, heavy metals, petroleum constituents from oils or fuels that have dripped from passing rail cars, and/or PAH, a by-product of fuel combustion.

The project site was not identified on the environmental database search report obtained for the project, as discussed in the ESA. A number of surrounding sites were identified in the environmental database search report, and documented releases affecting soil and groundwater have been identified. Based on review and analysis of the database listings, two of the surrounding sites were determined to pose a potential REC to the subject property because of their open status, reported releases, and location in relation to the subject property.

Additionally, based on the age of the Carlsbad Convention & Visitor Bureau built in 1887, ACM and/or lead-based paint may be present. The Proposed Action does not include disturbance or modification to the Carlsbad Convention & Visitors Bureau; therefore, no hazardous materials/waste impacts are associated with the building.

The property was not listed in any of the environmental databases searched, nor was any RECs identified on the subject property requiring further assessment or remedial action.

Due to the intrusive nature of the proposed construction project, preliminary media sampling (surface and near surface soils in particular) will be conducted prior to any intrusive work at the site to confirm whether contaminants are or are not present at the subject property. If these contaminants are present, they may pose a risk to human health (site workers and the public within the vicinity of the subject property) from the inhalation of dust or direct contact with skin or eyes. Further, the contaminants may pose a risk to natural habitat or sensitive species in the open area around the lagoon, and may threaten the water quality of the lagoon.

Therefore, the Proposed Action could have an adverse impact related to hazardous materials/hazardous waste. However, with the implementation of HZ-1, the Proposed Action will minimize potential adverse impacts related to hazardous materials/waste. The Proposed Action is in compliance with all applicable regulations discussed in the regulatory setting.

No Action Alternative

The No Action Alternative is equivalent to the existing conditions; therefore, no impacts related to hazardous materials-hazardous waste are associated with maintaining the existing conditions.

3.7.4 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action could have an adverse impact related to hazardous materials/hazardous waste. In order to assure that contaminants are not present and minimize potential adverse impacts, the following mitigation measure will be implemented:

HZ-1 Conduct preliminary media sampling (surface and near surface soils in particular) prior to any intrusive work at the site to confirm whether contaminants are or are not present at the subject property.

3.7.5 Impact Analysis of Mitigation Measures

Implementation of media sampling would be performed by qualified professionals in accordance with standard sampling methods and would not result in an adverse impact to the environment.

3.8 Hydrology

The information provided in this section is summarized from the *Preliminary Drainage Study for the Carlsbad Village Double Track Project* (T.Y. Lin, 2014b), and the *Buena Vista Lagoon Bridge Fluvial Hydraulic Analysis Draft Report* (Everest International, 2014). These reports are provided as Appendices I1 and I2, respectively, of this EA.

3.8.1 Regulatory Setting

Executive Order 11988

EO 11988 was established in order to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. The Order requires agencies to provide leadership and to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out federal responsibilities.

3.8.2 Affected Environment

Hydrologic Setting

The project area is located within the Carlsbad HA (904.20) and the Agua Hedionda HA (904.30), which are within the Carlsbad Hydrology Unit (904.00). The receiving waters for the project area are the Buena Vista Lagoon to the north, which only mixes with the Pacific Ocean water during high storm events and the Agua Hedionda Lagoon to the south, which discharges to the Pacific Ocean.

The majority of the project (north of Carlsbad Village Drive) drains into the Buena Vista Lagoon. The Buena Vista Lagoon is a freshwater lagoon, separated from the Pacific Ocean and its tidal influence by a weir located at the lagoon outlet, approximately 100 feet from the coast. There are two swales located on either side of the tracks at the north end of the project that drain southerly into the lagoon. The NCTD ROW in this area is unpaved. A portion of the surrounding neighborhood consisting of single-family homes drains into the trackside swales.

To the south, Washington Street and its surrounding parcels, the Army and Navy Academy Athletic Field, and the NCTD ROW west of the tracks drain along a trackside ditch that flows north into Buena Vista Lagoon. Two inlets located on Washington Street lead to the ditch through two 18-inch Reinforced Concrete Pipe (RCP). Additional offsite flows join the ditch north of Beech Avenue by a 19x30 inch elliptical RCP storm drain connected to four inlets collecting runoff from Carlsbad Boulevard and surrounding parcels. Peak flow data from the offsite portion of Carlsbad Boulevard was incorporated in the study.

The northernmost portion of the station parking lot, the unpaved NCTD maintenance yard, and the NCTD ROW east of the tracks drain north into the lagoon in a swale along the east side of the tracks. The remaining portion of the station parking lot, the station itself, Grand Avenue and Carlsbad Village Drive all drain into the City of Carlsbad storm drain system. The storm drain system leads to a 66-inch storm drain that follows the alley just east of the station out to State Street then outfalls into Buena Vista Lagoon. South of Carlsbad Village Drive, runoff from the project joins the Santa Fe Storm Drain, an 84-inch RCP storm drain that flows south directly into Agua Hedionda Lagoon.

Flooding

Under existing conditions, the water level in the lagoon is generally governed by the invert elevation of the weir located at the lagoon outlet. For existing lagoon condition scenarios utilized to determine the impact of flood flows on water surface elevations, a water elevation of 5.6 feet was utilized to represent the initial lagoon water level, as this elevation matches the invert elevation of the existing weir. Under existing lagoon and bridge conditions, the 50-year and 100-year maximum flood water elevations at the existing railroad bridge are 10.4 feet and 12.3 feet, respectively.

Buena Vista Lagoon is identified as a Special Flood Hazard Area, Zone A, according to FEMA Flood Insurance Rate Map (FIRM) #06073C0761G (FEMA, 2013), indicating an area subject to inundation by the one percent annual chance (100-year) flood event, "generally determined using approximate methodologies due to a lack of detailed hydraulic analyses, including base flood elevations." Although a detailed hydraulic analysis, including base flood elevations, has been provided with the Fluvial Hydraulic Analysis Report (Everest International, 2014), the lagoon is expected to remain designated Special Flood Hazard Area Zone A, indicating a lack of hydraulic analysis or base flood elevations, until FEMA maps are officially updated. Once the maps are updated, it is anticipated that this area would be designated Special Flood Hazard Area Zone AE, an area that features the same risk of inundation as Zone A, but with base flood elevations established.

The existing railroad bridge generally avoids the flood hazard area by passing over the lagoon at an elevation of approximately 16 feet AMSL. However, in the center of the bridge, at its lowest point, there is an approximately 50-foot segment of track through which the existing alignment passes through the flood hazard area. In the event of a 100-year flood event, this portion of the bridge would be inundated by flood waters and rail service within the project area would be temporarily suspended until flooding subsides.

3.8.3 Environmental Consequences

Proposed Action

The construction of the new second track, removal of 15 feet of existing platform, and construction of a second westerly platform would result in a total of 1.48 acres of impervious area on the project site, which is a total net increase of 0.02 acres, but would maintain the existing overall drainage patterns in the area. The Proposed Action would not increase the peak flows in the existing storm drain system, and thus would not have any adverse impacts to the system.

The two inlets on Washington Street would be reconstructed and the storm drain would be re-routed to flow around the proposed pedestrian access ramps. North of the lagoon, the realignment of the tracks would increase the size of the westerly basin, causing an increase in runoff west of the tracks, and would decrease the size of the easterly basin, causing a decrease in runoff east of the tracks. There would be a slight increase in flow in the westerly trackside ditch south of the lagoon, but this flow drains directly into Buena Vista Lagoon, which would not be affected by the increase. The drainage ditches along the tracks would be re-graded to provide proper flow capacity and comply with NCTD standards, and riprap energy dissipaters would be constructed at the discharge points into the lagoon to mitigate 100-year storm velocities and prevent excessive erosion.

Flooding

The Proposed Action involves construction of a new double-tracked bridge that would raise the elevation of the tracks by five feet, thereby removing the tracks from within the Special Flood Hazard Area and eliminating potential flood hazard impacts to rail service. The new bridge would also be sufficiently high to avoid flood risks associated with the 100-year storm event occurring coincident with a 5.5 foot increase in mean sea level projected for the year 2100. This would also be sufficiently high to accommodate the additional risk associated with flow changes attributed to the currently anticipated future improvements to the two other Buena Vista Lagoon bridges (the I-5 bridge and the Coast Highway bridge).

Using a fluvial hydraulic model that represents the lagoon as four separate basins (Weir Basin, Railroad Basin, Coast Highway Basin, and I-5 Basin), the impact of the proposed bridge on flooding throughout the lagoon was evaluated based on changes to flood water levels associated with the proposed conditions. As shown in Table 3.8-1 below, the maximum water elevations under the proposed conditions (scenarios 3 and 4) are the same as under the existing conditions (scenarios 1 and 2). Additionally, a 25-year storm event was modeled to simulate flooding conditions during construction of the proposed bridge. Maximum water elevations at the bridge during construction were determined to be 8.9 feet. These results indicate that the proposed bridge would not cause adverse flooding impacts during either construction or operation.

Table 3.8-1
Maximum Water Elevations Comparison between Existing and Proposed Railroad Bridges

Scenario No.	Storm Event	Railroad Bridge	Maximum Water Elevation			
			Weir Basin	Railroad Basin	Coast Highway Basin	I-5 Basin
1	50-Year	Existing	10.4	10.4	10.5	13.5
2	100-Year	Existing	12.2	12.3	12.3	16.3
3	50-Year	Proposed	10.4	10.4	10.5	13.5
4	100-Year	Proposed	12.2	12.3	12.3	16.3

Source: Everest International, 2014

With installation of the proposed bridge, the maximum flood elevations during a 50-year and 100-year storm event at the bridge location are not expected to exceed the maximum flood elevations during a 50-year and 100-year storm event under the existing conditions (10.4 feet and 12.3 feet, respectively). Model results indicate the flood conditions with the proposed bridge would be the same. However, accounting for the projected mean sea level increase anticipated by the years 2050 and 2100, maximum flood elevations during the 100-year storm event would be 12.3 feet and 12.5 feet, respectively.

No Action Alternative

Under the No Action Alternative, no project related activities, including construction, would occur. The project area would remain as it exists today; therefore, there would be no impact on hydrology.

3.8.4 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action would not adversely impact the drainage patterns within the project area's hydrologic setting. To ensure no permanent impacts to hydrology occur, a hydromodification management plan, and a SWPPP detailing BMPs would be prepared during final design. No mitigation measures are required.

3.8.5 Impact Analysis of Mitigation Measures

Since the implementation of the Proposed Action would not result in any anticipated impacts to hydrology or flooding, no mitigation measures are required.

3.9 Land Use, Zoning, and Property Acquisitions

The information contained in this section is summarized from the *Pacific Surfliner Carlsbad Village Double-Track Project Land Use Technical Report* (BRG, 2014d) as well as the *Community Impact Assessment* prepared by BRG Consulting, Inc. (BRG, 2014b). The Land Use Technical Report is provided as Appendix J of this EA. The Community Impact Assessment is provided as Appendix D of this EA.

3.9.1 Regulatory Setting

3.9.1.1 Federal

Coastal Zone Management Act

The CZMA encourages states/tribes to preserve, protect, develop, and where possible, restore or enhance valuable natural coastal resources such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as the fish and wildlife using those habitats (NOAA, 2013). The National Oceanic and Atmospheric Administration's (NOAA's) Office of Ocean and Coastal Resource Management (OCRM) administers the CZMA at the federal level. The CZMA outlines two national programs for coastal management, the National Coastal Zone Management Program (CZMP) and the National Estuarine Research Reserve System (NERRS). State/tribe participation in the CZMA is voluntary, but participation makes federal financial assistance available to any coastal state, tribe, or territory willing to develop and implement a comprehensive coastal management program. Upon certification of a state's coastal management program, the CZMA gives state coastal management agencies regulatory control over all federal activities and federally licensed, permitted or assisted activities, wherever they may occur within coastal zone boundaries if the activity affects coastal resources (CCC, 2012).

Section 307, also known as the federal consistency provision, is a requirement where federal agency activities (activities and development projects performed, authorized or funded by a federal agency) that have reasonably foreseeable effects on any land or water use or natural resource of the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of a coastal state's federally approved coastal management program. Additionally, federal license or permit activities and federal financial assistance activities that have reasonably foreseeable coastal effects must be fully consistent with the enforceable policies of state coastal management programs. A lead state agency performs federal consistency reviews (usually the same agency that implements or coordinates the state's federally approved coastal management program). As such the enforceable policies outlined in Chapter 3 of the CCA are the basis for federal coastal consistency certification. At the federal level, the Office of OCRM interprets the CZMA and oversees the application of federal consistency (NOAA, 2013).

3.9.1.2 State

California Coastal Act

The CCA of 1976 permanently established the CCC and replaced Proposition 20, an initiative passed in 1972. The CCC was initially established by the Proposition 20 initiative as an interim agency to prepare planning documents within a four-year period. By passing the CCA of 1976 the State Legislature created the mandate for preparation of LCP. The CCA includes specific policies that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands,

commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works.

The CCC plans and regulates the use of land and water in the coastal zone. Development activities, which are broadly defined by the CCA to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a Coastal Development Permit (CDP) from either the CCC or the local government. Along with the Bay Conservation and Development Commission and the California Coastal Conservancy, the CCC is one of California's three designated coastal management agencies for the purpose of administering the CZMA (CCC, 2012).

3.9.1.3 Regional

North Coast Corridor Public Works Plan/Transportation and Resource Enhancement Program

The North Coast Corridor (NCC) PWP/TREP, jointly prepared by SANDAG and Caltrans in collaboration with the CCC, local cities, resource agencies, and the public, is a single integrated document that establishes a framework for comprehensively planning, reviewing, and permitting of the NCC's transportation, community, and resource enhancement projects. The PWP/TREP lays out a blueprint for implementing a 40-year program of rail, highway, transit, bicycle, pedestrian, and coastal resource improvements that span 27 miles of the Northern San Diego County coastline from La Jolla to Oceanside. It allows these improvements to be analyzed as an integrated system, with the goal of optimizing the suite of improvements so that transportation goals are met in a manner that maintains and enhances public access to coastal resources and recreational facilities, and sensitive coastal resources are protected and enhances wherever feasible. The PWP/TREP also serves as the regulatory document that provides a comprehensive mechanism for conducting a federal consistency review under the CZMA for the entire NCC project (SANDAG, 2013b).

Consistent with the San Diego Forward: The Regional Plan, the NCC PWP/TREP project improvements would create a balanced multimodal system and enhanced coastal environment through three main components:

- Significant rail and highway infrastructure improvements;
- Enhanced and newly established bicycle and pedestrian coastal access routes; and
- Preserved, restored, and enhanced sensitive coastal habitat through significant water quality, lagoon, and natural habitat improvements.

The PWP/TREP would improve conditions for coastal resources by enhancing public transit and non-motorized transportation alternatives to reduce energy consumption and air emissions, and would implement improvements to the existing transportation system that eliminate existing impediments and enhance coastal access opportunities for residents and visitors. Further, the PWP/TREP improvements will foster healthy and sustainable coastal communities by:

- Limiting traffic congestion on local streets;
- Minimizing energy consumption and air and GHG emissions related to travel; and
- Improving the transportation system in a way that supports the concept of Smart Growth as a means of accommodating anticipated future growth in the NCC.

SANDAG Regional Comprehensive Plan (RCP)

Through the SANDAG's RCP, the San Diego region has established an incentivized planning framework for coordinated regional housing, land use, transportation, and sustainability planning (SANDAG, 2004). The RCP is the foundation of integrating land use, transportation systems, infrastructure needs, and public investment strategies in a regional smart growth framework. It provides a regional vision and a broad context in which local and regional decisions can be made to foster a healthy environment and economy, and a high quality of life for all San Diegans. The RCP is based on three goals and objectives:

- Improving connections between land use and transportation plans using smart growth principles;
- Using land use and transportation plans to guide other decisions regarding environmental and public facility investments; and
- Focusing on collaboration and the use of incentives to achieve regional goals and objectives.

The Urban Form and Transportation section of the RCP outlines four regional goals:

- Focus future population and job growth away from rural areas and closer to existing and planned job centers and public facilities to preserve open space and to use existing urban infrastructure more efficiently;
- Create safe, healthy, walkable, and vibrant communities that are designed and built to be accessible to people of all abilities;
- Integrate the development of land use and transportation, recognizing their interdependence; and
- Develop a flexible, sustainable, and well-integrated transportation system that focuses on moving people and goods - not just vehicles.

San Diego Forward: The Regional Plan (The Regional Plan)

The Regional Plan presents a transportation system designed to maximize transit enhancements, integrate biking and walking elements, and promote programs to reduce demand and increase efficiency (SANDAG, 2015a). The Regional Plan Final EIR (SANDAG, 2015b) generally addresses regional issues related to the LOSSAN corridor rail line double-track projects. The Regional Plan Chapter 2—A Strategy for Sustainability: Smart Growth and environmental protection through transportation choices—includes the components of the Sustainable Communities Strategy required by SB 375.

Multiple Habitat Conservation Program

The Multiple Habitat Conservation Program (MHCP) is a comprehensive conservation planning process that addresses the needs of multiple plant and animal species in northwestern San Diego County (SANDAG, 2013a). The MHCP encompasses the cities of Carlsbad and Oceanside (as well as Encinitas, Escondido, San Marcos, Solana Beach, and Vista). Its goal is to conserve approximately 19,000 acres of habitat, of which roughly 8,800 acres (46 percent) are already in public ownership and contribute toward the habitat preserve system for the protection of more than 80 rare, threatened, or endangered species.

The MHCP Subregional Plan and Final EIS/EIR were adopted and certified by the SANDAG Board of Directors on March 28, 2003. Subarea plans for the cities of Carlsbad and Oceanside have been prepared and adopted by their

respective City Councils. Implementing agreements with the CDFW and USFWS have been signed and incidental take permits can be issued.

Coordinated through SANDAG, the MHCP is one of three subregional habitat conservation planning programs in the region that, together, will contribute to a coordinated preserve system for the San Diego region and Southern California. With the preserve area defined in advance of development, builders will know where new homes, employment, and commercial centers can be placed. When completed, the habitat preservation areas will serve as a key component of the region's smart growth efforts by preserving habitat and open space and by directing forecasted growth into appropriate areas.

3.9.1.4 Local

City of Carlsbad General Plan

As required by State Planning and Zoning Law, the City of Carlsbad has developed a "comprehensive, long-term plan for the physical development of the City, and of any land outside its boundaries which bears relation to its planning" (State of California, 2000). The City must make a formal finding that each of the following is consistent with the general plan before it is approved: zoning; subdivision maps; building and housing regulations; master plans and specific plans; capital improvements; conditional use permits; and open space and parks dedications. The Carlsbad General Plan contains the seven mandatory general plan elements, with the addition of parks and recreation, and contains within each element maps, figures, policy statements, over-arching goals, more specific objectives, implementing programs, and in some instances development standards (City of Carlsbad, 2013).

The City of Carlsbad General Plan designation for the vicinity of the project corridor is "Residential", "Commercial", "Industrial", "Public Facilities and Utilities", and "Parks and Recreation". The existing railroad ROW lies within a designated "Transportation Corridor". In addition to these designations, portions of the project corridor lie within the following special overlay zones/districts: "Beach Area Overlay Zone"; "Coastal Zone"; and the "Village Area", which is regulated by the Carlsbad Village Master Plan.

The Beach Area Overlay Zone provides supplementary regulations for development within designated beach areas to ensure that development will be compatible with surrounding developments, both existing and proposed, in the beach area. Additionally, it provides for adequate parking as needed by residential projects and ensures that adequate public facilities will exist to serve the beach area. Further, it protects the unique mix of residential development and aesthetic quality of the area.

Almost every type of development proposed in the Coastal Zone, from the removal of vegetation to the construction of master planned communities requires the approval of a CDP in addition to any other permits or entitlements. The land use policies, programs and regulations of the relevant LCP (discussed below) shall be referred to in addition to the General Plan, the Municipal Code and other pertinent regulations for guiding land use and development within the Coastal Zone.

Carlsbad Village Master Plan and Design Manual

The Carlsbad Village Master Plan and Design Manual (City of Carlsbad, 2012) is the City of Carlsbad's official statement of design, zoning and land use, and long-range development strategy policy in order to create a strong identity, revitalize the area, enhance the economic potential, and establish specific site development standards for the Village. Additionally, the Village Master Plan and Design Manual, together with the implementing ordinances and Manual of Policies and Procedures serves as the LCP for the Carlsbad Village Area segment of the Carlsbad Coastal Zone pursuant to the requirements of the CCA.

The intent of the Village Master Plan and Design Manual is to preserve the Village character of the area by creating a pedestrian scale environment of specialty shops, services, and restaurants complemented by residential and mixed-use development. It sets forth the zoning and allowed land uses for the Village, which is a special review area. It also sets forth the standards and criteria by which development shall proceed in the Village Area, as well as serves as a Master Plan for the Village Area and implements, and is consistent with, the General Plan. The General Plan references the Village Master Plan for details on development and implementation strategies within the Village Area to meet the goals and objectives of the General Plan for the Village Area.

Carlsbad Municipal Code Chapter 21 (Zoning)

Chapter 21 (Zoning) of the City of Carlsbad Municipal Code is an official, adopted land-use plan for the City established to serve the public health, safety and general welfare, and to provide the economic and social advantages resulting from an orderly planned use of land resources. The existing zoning within the quarter-mile affected environment for the Proposed Action is General Commercial, Commercial-Tourist, One-Family Residential, Multiple-Family Residential, Residential-Agricultural, Residential Density-Multiple, Open Space, Transportation Corridor, and Village Review.

Carlsbad Habitat Management Plan

The City of Carlsbad Habitat Management Plan (HMP) (City of Carlsbad, 2004) is part of a regional planning effort to create an interconnected system of open space lands that will function at the ecosystem level. The HMP constitutes the City's subarea (city-specific) plan within the MHCP Subregional Plan for north coastal San Diego County. The HMP for the City of Carlsbad proposes a comprehensive, citywide program to identify how the City of Carlsbad, in cooperation with federal and state wildlife agencies, can preserve the diversity of habitat and protect sensitive biological resources within the City of Carlsbad while allowing for additional development consistent with the City of Carlsbad's General Plan and its Growth Management Plan. In so doing, the HMP is intended to lead to citywide permits and authorization for the incidental take of sensitive species in conjunction with private development projects, public projects, and other activities, which are consistent with the HMP. These permits would be issued under the ESA, the California Endangered Species Act (CESA), and the California Natural Community Conservation Planning (NCCP) Act. The overall goal of the HMP is to contribute to regional biodiversity and the viability of rare, unique or sensitive biological resources throughout the City of Carlsbad and the larger region while allowing public and private development to occur consistent with the Carlsbad General Plan and Growth Management Plan.

City of Carlsbad Local Coastal Program

The CCA requires that its policies and provisions be implemented through preparation of an LCP. LCP is defined as "a local government's (a) land use plans, (b) zoning ordinances, (c) zoning district maps, and (d) within sensitive coast resources area, other implementing actions which when taken together, meet the requirements of, and implement the

provisions and policies of, this division at the local level" (City of Carlsbad, 2010). Section 30500 of the CCA states that "each local government lying, in whole or in part, within the Coastal Zone shall prepare an LCP for that portion of the Coastal Zone within its jurisdiction," and "the precise content of each local coastal program shall be determined by the local government, consistent with Section 30501, in full consultation with the commission and with full public participation" (California Public Resources Code, 2013). Once the CCC has certified an LCP, CDP issuance authority is typically delegated to the appropriate local government, however the CCC retains original permit jurisdiction over certain specified lands (such as tidelands and public trust lands). Development within the Coastal Zone may not commence until a CDP has been issued (CCC, 2012).

Approximately one-third of the City of Carlsbad is located within the Coastal Zone. Carlsbad's coastal zone is divided into six segments and is regulated by two separate LCPs. The Proposed Action only passes through two of the six segments: the Mello II segment and the Village segment. The Mello II segment is within the boundaries of the City of Carlsbad LCP. The Village segment is within the boundaries of the Carlsbad Village Master Plan, which serves as the segment's LCP.

City of Oceanside General Plan

As required by State Planning and Zoning Law, the City of Oceanside has developed a "comprehensive, long-term plan for the physical development of the City of Oceanside, and of any land outside its boundaries which bears relation to its planning" (State of California, 2000). For the City of Oceanside, the General Plan is "the primary source of long-range planning and policy direction that will be used to guide growth and preserve the quality of life within the City" (City of Oceanside, 2002). To address future growth and development, the General Plan includes goals, objectives, policies, and plans, which are used to guide future land use and development decisions. Consequently, the Zoning Ordinance, Specific Plans, and individual public and private development proposals must be consistent with the General Plan goals, objectives, policies, and standards. The Oceanside General Plan contains ten elements, with Community Facilities, Hazardous Waste Management, and Military Reservation Elements in addition to the State mandated seven elements.

The City of Oceanside General Plan designation for the project corridor is "Residential", "Commercial", and "Parks and Recreation". In addition to these designations, the project corridor lies within the Coastal Zone. The Coastal Zone requires that almost every type of development proposed, from the removal of vegetation to the construction of master planned communities requires the approval of a CDP in addition to any other permits or entitlements. The land use policies, programs and regulations of the relevant LCP (discussed below) shall be referred to in addition to the General Plan, the Municipal Code and other pertinent regulations for guiding land use and development within the Coastal Zone.

Oceanside Zoning Ordinance

The Zoning Ordinance of the City of Oceanside was established to protect and promote the public health, safety, and general welfare of its residents, as well as to implement the City of Oceanside's General Plan. It provides a specific guide for the physical development of the City of Oceanside. The existing zoning within the quarter-mile affected environment for the Proposed Action is Limited Commercial, Commercial Professional, Commercial Recreation, Visitor Commercial, Open Space, Public and Semipublic, Urban High Density Residential, Medium Density Residential, Single Family Residential, and Residential Tourist.

Oceanside Subarea Habitat Conservation Plan

The City of Oceanside Subarea Habitat Conservation Plan (SHCP) is part of a regional planning effort to create an interconnected system of open space lands that will function at the ecosystem level. The SHCP constitutes the City of Oceanside's subarea (City-specific) plan within the MHCP Subregional Plan for north coastal San Diego County.

The Oceanside SHCP comprehensively addresses how the City of Oceanside will conserve natural biotic communities and sensitive plant and wildlife species pursuant to the California NCCP Act and ESA (City of Oceanside, 2010). It is a NCCP and a HCP pursuant to Section 10(a) of the ESA (as amended). The SHCP is intended to lead to citywide permits and authorization for the incidental take of sensitive species in conjunction with private development projects, public projects, and other activities, which are consistent with the SHCP. The City of Oceanside, in turn, may then authorize the taking of natural habitats or associated species by public or private projects within its jurisdiction, as long as those biological resources are conserved and managed by the SHCP and the projects are consistent with and covered by the provisions of the SHCP.

City of Oceanside Local Coastal Program

The CCA requires that its policies and provisions be implemented through preparation of an LCP. LCP is defined as "a local government's (a) land use plans, (b) zoning ordinances, (c) zoning district maps, and (d) within sensitive coast resources area, other implementing actions which when taken together, meet the requirements of, and implement the provisions and policies of, this division at the local level" (City of Oceanside, 1985). Section 30500 of the CCA states: "each local government lying, in whole or in part, within the Coastal Zone shall prepare a LCP for that portion of the Coastal Zone within its jurisdiction," and "the precise content of each LCP shall be determined by the local government, consistent with Section 30501, in full consultation with the commission and with full public participation" (California Public Resources Code, 2013). Once the CCC has certified an LCP, CDP issuance authority is typically delegated to the appropriate local government, however the CCC retains original permit jurisdiction over certain specified lands (such as tidelands and public trust lands). Development within the coastal zone may not commence until a CDP has been issued (CCC, 2012).

The northern portion of the Proposed Action passes through the City of Oceanside coastal zone and is within the boundaries of the City of Oceanside LCP.

3.9.2 Affected Environment

As shown on Figure 3.9-1, existing land uses at the project site consist primarily of single-family and multi-family residential adjacent to the railroad ROW within the Oceanside portion. Around the Buena Vista Lagoon, land is preserved as open space. There is a greater mix of land uses surrounding the railroad ROW within the Carlsbad portion, including commercial/office, multi-family residential, the recreational fields for the Army and Navy Academy, the Carlsbad Village Station and parking lot.

3.9.3 Environmental Consequences

3.9.3.1 Proposed Action

A. Local Coastal Programs

City of Carlsbad

The Proposed Action passes through a small portion of the Mello II segment, and is primarily located within the Buena Vista Lagoon adjacent to the existing single-track bridge. In addition, the Proposed Action is located within previously disturbed/developed lands, as it lies within the existing railroad ROW. Sensitive vegetation is located in the northern portion of the project area where the proposed tracks would cross the lagoon. Improvements within the lagoon would impact sensitive habitat which include disturbed coastal sage scrub, freshwater marsh, southern coastal salt marsh, disturbed southern willow scrub and estuarine (SANDAG, 2013a). The Proposed Action would demonstrate Coastal Consistency through a Federal Coastal Consistency Certification. It is expected that the Coastal Commission would consider the City of Carlsbad's LCP during the Proposed Action's Federal Coastal Consistency Certification hearing that would be required for a future Clean Water Act Section 404 permit. Consistency with the Village segment LCP/CZMP is discussed in the Land Use Technical Report (Appendix J of this EA).

City of Oceanside

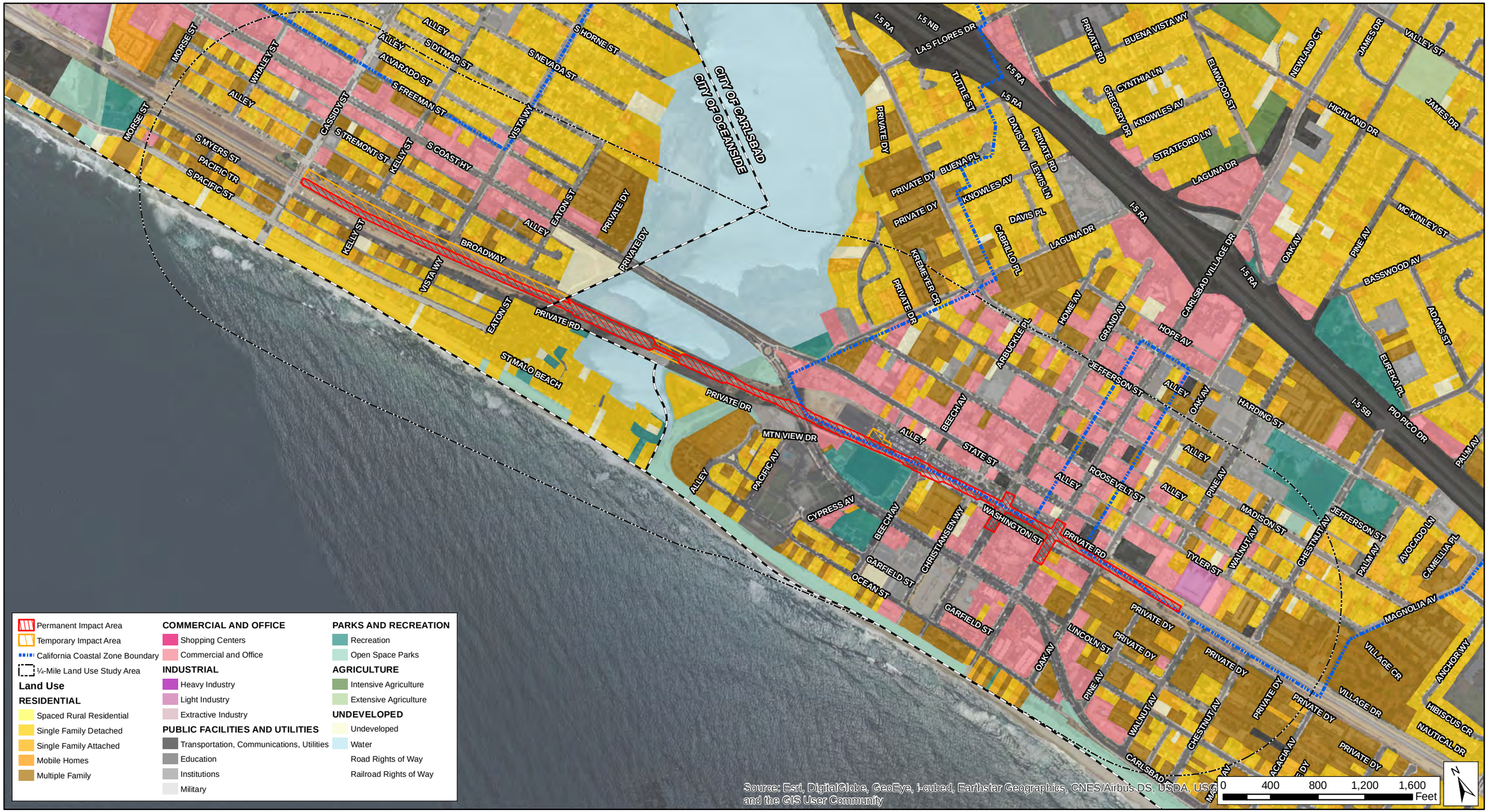
The Proposed Action passes through a small portion of the City of Oceanside and only a small portion of the coastal zone. It is located within the Buena Vista Lagoon adjacent to the existing single-track bridge and extends north to Cassidy Street. In addition, the Proposed Action is located within previously disturbed/developed lands, as it lies within the existing railroad ROW. Sensitive vegetation is located in the northern portion of the project area where the proposed tracks would cross the existing Buena Vista Lagoon. Improvements within the lagoon would impact sensitive habitat which includes disturbed coastal sage scrub, freshwater marsh, southern coastal salt marsh, disturbed southern willow scrub and estuarine (SANDAG, 2013a). The Proposed Action would demonstrate Federal Coastal Consistency through a Coastal Consistency Certification. It is expected that the Coastal Commission would consider the City of Oceanside's LCP during the Proposed Action's Coastal Consistency Certification hearing that would be required for a future Clean Water Act Section 404 permit.

B. City of Carlsbad General Plan

The Proposed Action is consistent with the City of Carlsbad General Plan goals and policies that are applicable to the Proposed Action.

C. Carlsbad Village Master Plan

The Proposed Action is consistent with all goals of the Carlsbad Village Master Plan. Portions of the Carlsbad Village Center, Residential Support, and Service Commercial Support Land Use Districts, which are located within the Village Area, are also located within the Transportation Corridor. For those properties located both within the Village Area and the Transportation Corridor, the following applicable permitted land uses include: Light-Rail Stations, Private or Public Parking Lots, Railroad Tracks, and Passive Open Space. According to the Carlsbad Village Master Plan, the primary use of the Transportation Corridor shall be for transportation facilities and improvements that provide rail and transit services and support facilities. The permitted, provisional, and accessory land uses allowed in Land Use Districts 1, 4 and 6, as set forth in the land use matrix of the Carlsbad Village Master Plan will also be allowed on the properties



SOURCE: Esri, 2014; SanGIS, 2014; T.Y. Lin, 2013

9/12/16

Carlsbad Village Double Track EA

Existing Land Use

FIGURE 3.9-1

located within the corresponding and adjacent portions of the Transportation Corridor and north of Carlsbad Village Drive. The Proposed Action is consistent with the goals of the Carlsbad Village Master Plan that are applicable to the Proposed Action.

D. Carlsbad Municipal Code Chapter 21 (Zoning)

The Proposed Action lies within multiple City of Carlsbad zoning districts (see Section 3.9.1.4 of this EA). The project occurs entirely within the existing railroad ROW presently located in a Transportation Corridor zone. Applicable permitted uses within a Transportation Corridor zone include light-rail transit related facilities, railroad tracks and related facilities, and signs subject to the provisions of Chapter 21.41 of the Municipal Code. The Proposed Action is consistent with City of Carlsbad zoning.

E. Carlsbad Habitat Management Plan

The Proposed Action is consistent with the objectives of the Carlsbad HMP. Although the Proposed Action would result in adverse impacts to biological resources, including rare and sensitive habitats, mitigation would be required to ensure that the Proposed Action would not result in a net loss of wetland habitat. The Proposed Action would implement the objectives of the Carlsbad HMP by avoiding impacts to habitat to the extent practicable, minimizing unavoidable impacts, and mitigating any impacts that cannot be avoided or minimized. It is expected that the USFWS consultation would result in the adoption of conservation measures that are generally consistent with the HMP. Section 3.3 of this EA contains details on the conservation measures proposed.

F. City of Oceanside General Plan

The Proposed Action is consistent with the City of Oceanside General Plan goals and policies that are applicable to the Proposed Action.

G. Oceanside Zoning Ordinance

The Proposed Action lies within multiple City of Oceanside zoning districts (see Section 3.9.1.4 of this EA). Railroads are not specifically addressed as an allowable use within the City of Oceanside Zoning Ordinance but they would be deemed allowable because railroads are an existing use.

H. Oceanside Subarea Habitat Conservation Plan

The Proposed Action is consistent with the goals and objectives of the Oceanside SHCP. Although the Proposed Action would result in adverse impacts to biological resources, including ecological communities or key wildlife corridors and habitat linkages, mitigation would be required to ensure that the Proposed Action would not result in a net loss of wetland habitat. The Proposed Action would implement the objectives of the Oceanside SHCP by avoiding impacts to habitat to the extent practicable, minimizing unavoidable impacts, and mitigating any impacts that cannot be avoided or minimized. Section 3.3 of this EA contains details on the conservation measures proposed.

I. San Diego Forward: The Regional Plan

The Proposed Action is an element of the LOSSAN Corridor project identified in The Regional Plan. Therefore, implementation of the Proposed Action would meet the goals and objectives of The Regional Plan without conflict.

J. Property Acquisitions

There are no property acquisitions associated with the Proposed Action. All work will occur within the existing ROW. Therefore, there are no adverse impacts associated with property acquisitions.

3.9.3.2 No Action Alternative

Because no development would occur under the No Action Alternative, there is no impact associated with a LCP, General Plan, Zoning Ordinance, or HCP for Oceanside or Carlsbad with the implementation of the No Action Alternative. However, the No Action Alternative is not consistent with the goals and objectives of The Regional Plan because it does not implement the double track from MP 224.8 in Carlsbad to MP 225.9 in Oceanside. Therefore, the No Action Alternative would conflict with The Regional Plan.

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action is consistent with the goals and objectives of the General Plans and HCPs of the cities of Carlsbad and Oceanside and does not involve property acquisitions. Areas subject to temporary biological impacts would be revegetated and fully restored as discussed in Section 3.3 of this EA. As such, the Proposed Action balances the regional need for more efficient passenger and freight rail service along the LOSSAN corridor with the communities' desire to preserve wildlife habitat.

3.9.5 Impact Analysis of Mitigation Measures

Since the implementation of the Proposed Action would not result in any anticipated land use impacts, no mitigation measures are required and therefore there would be no impacts from mitigation implementation.

3.10 Noise and Vibration

The information provided in this section is summarized from the *Draft Noise and Vibration Impact Assessment* for the Pacific Surfliner Carlsbad Village Double-Track Project prepared by ATS Consulting (ATS Consulting, 2014). The Draft Noise and Vibration Impact Assessment is provided as Appendix K of this EA.

3.10.1 Regulatory Setting

Noise and vibration impacts for this project are based on the criteria as defined in the FRA Office of Railroad Policy and Development, High-Speed Ground Transportation Noise and Vibration Impact Assessment, Document DOT/FRA/ORD-12/15, September 2012 (FRA 2012) and the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment, Document FTA-VA-90-1003-06, May 2006 (FTA 2006). The FRA provides guidelines for the assessment of noise and vibration impacts in the High-Speed Ground Transportation Noise and Vibration Impact Assessment. There are also local guidelines related to potential noise impacts associated with construction at sensitive receiving properties, which are further discussed in Section 3.16.10 of this EA.

3.10.1.1 Federal Railroad Administration

A. Noise Criteria

The FRA noise impact criteria are based on the best available research on community response to noise. The FRA uses three land use categories to differentiate between areas where higher noise levels are more frequent. For Category 2 land uses, noise exposure is characterized using Day-Night Sound Level (Ldn), which is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m. Category 1 and Category 3 land uses, noise exposure is characterized using the maximum hourly Leq, which is an average of the sound energy occurring over a specified period. The one-hour A-weighted equivalent sound level (Leq[h]), for example, is the energy average of A-weighted sound levels occurring during a one-hour period. One hour is the normal (default) assumed time period for Leq unless stated otherwise. The basic concept of the FRA noise impact criteria is that more project noise is allowed in areas where existing noise is higher, but that the decibel increase in total noise exposure (the decibel sum of existing noise and project noise) decreases as existing noise increases. Table 3.10-1 lists the three land use categories along with the applicable noise metric for each category. The allowable increase in cumulative noise levels are shown in Figure 3.10-1.

B. Vibration Criteria

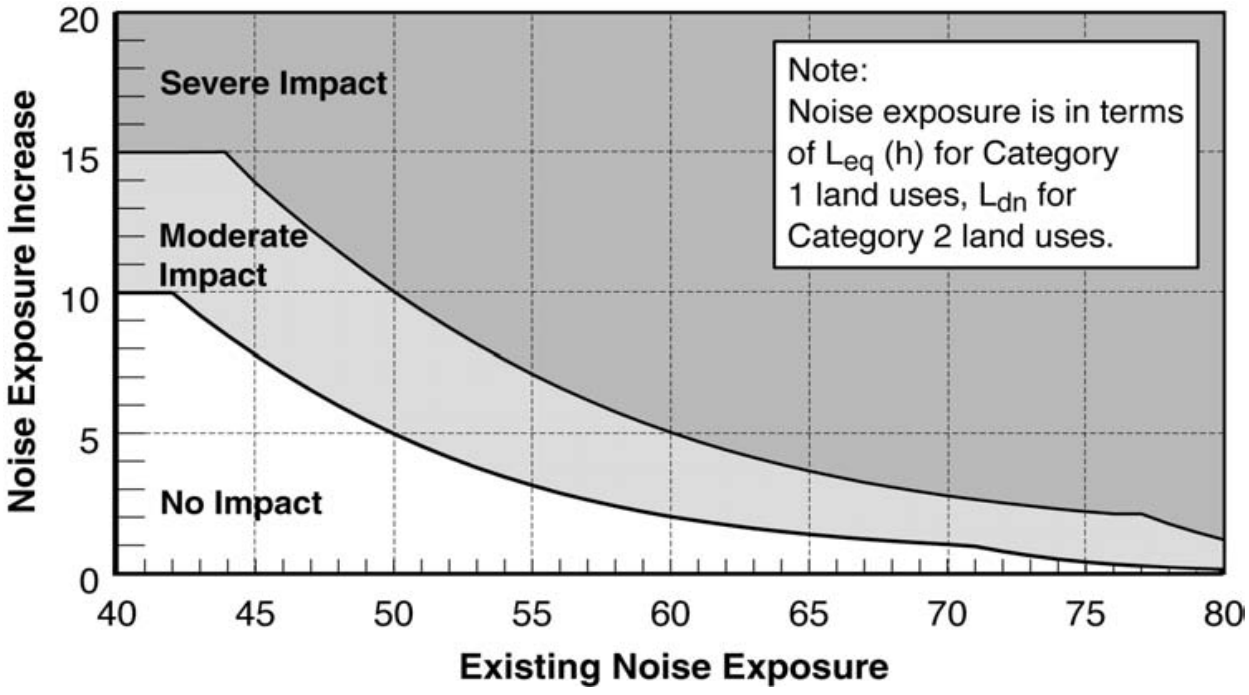
The FRA groundborne vibration and noise impact criteria are based on land use and train frequency, and are shown in Table 3.10-2. The project area would be characterized as experiencing occasional events today, and frequent events by the year 2030. The FRA uses separate criteria for groundborne noise: the “rumble” that can be radiated from the motion of room surfaces in buildings due to groundborne vibration. Although expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are set significantly lower than for airborne noise to account for the annoying low-frequency character of groundborne noise. For the Proposed Action, groundborne noise criteria are applied only to buildings that have sensitive interior spaces that are well insulated from exterior noise.

Table 3.10-1
FRA Land Use Categories and Noise Metrics

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor $L_{eq}(h)^a$	A tract of land where quiet is an essential element of their intended purpose. This category includes lands set aside for serenity and quiet and such land uses as outdoor amphitheaters and concert pavilions, as well as national historic landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor L_{dn}	Residences and buildings in which people sleep. This category includes homes, hospitals, and hotels, where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor $L_{eq}(h)^a$	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, and churches, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities can be considered to be in this category. Certain historical sites and parks also are included.

Note: [a] Leq for the noisiest hour of rail-related activity during hours of noise sensitivity. Source: FRA, 2012.

Figure 3.10-1
Allowable Increase in Cumulative Noise Levels for Land Use Categories 1 and 2



Source: FTA, 2006.

Table 3.10-2
FRA Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro-inch/sec)			Groundborne Noise Impact Levels (dB re 20 micro-Pascals)		
	Frequent Events [a]	Occasional Events [b]	Infrequent Events [c]	Frequent Events [a]	Occasional Events [b]	Infrequent Events [c]
Category 1. Buildings where vibration would interfere with interior operations.	65 VdB[d]	65 VdB[d]	65 VdB[d]	N/A[e]	N/A[e]	N/A[e]
Category 2. Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3. Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: FRA, 2012.
Notes: [a] Frequent events are defined as more than 70 vibration events of the same kind per day per day.
[b] Occasional events are defined as between 30 and 70 events of the same kind per day per day.
[c] Infrequent events are defined as fewer than 30 events of the same kind per day.
[d] VDB=Vibration decibels. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
[e] Vibration-sensitive equipment is not sensitive to groundborne noise.

3.10.1.2 City of Carlsbad Residential Exterior Noise Standard

It is the policy of the City of Carlsbad that 60 dBA community noise equivalent level (CNEL) is the exterior noise level to which residential units must be mitigated, except that for areas impacted by McClellan Palomar Airport shall be mitigated to 65 dBA CNEL. CNEL is the 24 hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder. The aforementioned FRA standards apply to train noise.

3.10.2 Affected Environment

The Proposed Action occurs entirely within the existing railroad ROW, which currently generates noise and vibration from existing train operations. The primary component of wayside noise from passenger and freight train operations is the diesel propulsion engine and the wheel/rail noise. Secondary sources, such as vehicle air-conditioning and other ancillary equipment, would sometimes be audible but not significant sources of noise. The existing daily service level volumes for train operations from Oceanside to San Diego for 2012 include 22 inter-city trains (Amtrak), 22 commuter trains (Coaster), and six freight trains (BNSF) for a total daily volume of 50 train trips (SANDAG, 2013d).

3.10.2.1 Surrounding Land Uses

Land use in the project area includes single- and multi-family dwelling units, commercial and retail uses. The northern part of the project is in Oceanside. This area begins at Cassidy Street and extends south to Pacific Street on both side of the railroad ROW. As the alignment extends south over the Buena Vista Lagoon to the City of Carlsbad the land use includes both residential and commercial uses. Within the Village of Carlsbad there are single- and multi-family residential buildings that are located next to retail and commercial buildings. The historic Carlsbad Santa Fe Depot is particularly sensitive to vibration effects.

3.10.2.2 Sources of Operational Noise

All existing and future trains through at least the year 2030 will be diesel-powered. Operational noise is generated by train vehicles in motion. Vehicle propulsion units generate: (1) diesel-engine exhaust noise, (2) air-turbulence noise generated by cooling fans, and (3) gear noise. Additional noise of motion is generated by the interaction of wheels with their running surfaces. The interaction of steel wheels and rails generates three types of noise: (1) rolling noise due to continuous rolling contact, (2) impact noise when a wheel encounters a discontinuity in the running surface, such as a rail joint, turnout or crossover, and (3) squeal generated by friction on tight curves (FTA, 2006).

Vehicle speed also plays a factor in sound level strength. At low speeds, the locomotive exhaust noise dominates. As speed increases, wheel-rail noise becomes the dominant noise source. Noise is also generated by trains when they are stationary. Auxiliary equipment, such as cooling fans on motors, radiator fans, hydraulic, pneumatic and air-conditioning pumps, often continue to run when vehicles are stationary (FTA, 2006).

Trains are equipped with horns and bells for use in emergency situations and as a general audible warning to track workers and trespassers within the ROW as well as to pedestrians and motor vehicles at highway grade crossings. Horns and bells on the moving trains, combined with stationary bells at grade crossings can generate noise levels considered to be extremely annoying to nearby residents (FTA, 2006). Table 3.10-3 summarizes sources of operational noise for commuter rail and freight operations.

Table 3.10-3
Sources of Operational Noise

Vehicle or Facility	Dominant Components	Comments
Passenger and Freight Trains	Diesel exhaust	On diesel-hauled trains
	Cooling fans	On diesel-powered trains
	Wheel/rail interaction	Depends on condition of wheels and rails
	Horns and crossing gate bells	At grade crossings
	In general,	Noise is usually dominated by locomotives and Horns at grade crossings

Source: FTA, 2006.

3.10.2.3 Existing Noise/Vibration Levels

A. 24-Hour Noise Measurements

The ambient noise measurements taken for the Proposed Action consisted of 24-hour, unattended noise measurements at four locations, Sites LT-1 through LT-4. The 24-hour measurements are in residential neighborhoods where the noise impact criteria are based on L_{dn} over a 24-hour period. The 24-hour noise measurements conducted at Sites LT-1 through LT-4 are presented in Table 3.10-4 for each monitoring location, the approximate distance of that location from the centerline of the middle track, the land use type, the type of measurement, and the measured noise level at that location.

Table 3.10-4
Summary of 24-Hour Noise Measurements

Site	Location	Type of Land Use	Dist. To Track Centerline (feet)	Start Date	Start Time	Sound Level (dBA)		
						L_{eq}(day)	L_{eq}(night)	L_{dn}
LT-1	1906 Broadway Street	MFR	195	7/31/2013	10:37 a.m.	67	60	68
LT-2	110 Vista Way	SFR	180	7/31/2013	10:19 a.m.	61	57	64
LT-3	270 Pacific Avenue	MFR	275	8/1/2013	11:50 a.m.	56	52	60
LT-4	393 Oak Street	SFR	100	8/1/2013	12:15 p.m.	67	60	69

Notes: MFR – Multi-Family Residence
SFR – Single-Family Residence
Source: ATS Consulting, 2014.

B. Train Passby Measurements

The noise and vibration from Amtrak, Coaster, and BNSF freight trains were measured at five locations, Sites M1 through M5. The noise measurements included train horns and at grade crossing bells. The results were used to define the reference noise and vibration levels used as the basis of the future build predictions. The noise and vibration predictions for the Proposed Action are based on existing passby noise and vibration levels of Amtrak, Coaster, and freight trains measured at five locations on ballast and tie track at Sites M1 through M5. The results of these measurements are presented in Table 3.10-5 as the maximum noise level (Lmax) and maximum vibration level for the different train passbys. The variation in the train noise and vibration is a function of distance to the track and train speed.

Table 3.10-5
Summary of Train Passby Measurements

Site	Measurement Site	Distance to Near Track Centerline (feet)	Noise Level - Lmax (dBA)			Vibration Level – Lmax (VdB)		
			Amtrak	Coaster	Freight	Amtrak	Coaster	Freight
M1	117 Eaton Street	65	92	85	---	76.2	71.4	---
		105	83	78	---	71.3	67.3	---
M2	302 Vista Way	190	82	87	---	62.0	56.9	---
		50	90	---	91	73.0	---	75.9
		100	85		86	67.6	---	68.9
M3	385 Beech Avenue	68	100	84	---	72.7	53.7	---
		140	95	77	---	63.2	47.4	---
M4	395 Carlsbad Village Drive	135	100	92	---	65.2	58.5	---
M5	1741 S. Myers Street	170	96	101	---	64.7	61.8	---

Source: ATS Consulting, 2014.

3.10.3 Environmental Consequences

Noise and vibration impacts for the Proposed Action are based on the criteria as defined in the U.S. Department of Transportation, FRA High-Speed Ground Transportation Noise and Vibration Impact Assessment (FRA 2012).

Proposed Action

Train Noise Impacts

The primary component of wayside noise from passenger and freight train operations is the diesel propulsion engine and the wheel/rail noise. Secondary sources, such as vehicle air-conditioning and other ancillary equipment, would sometimes be audible, but are not expected to be significant factors.

The projection of wayside noise from passenger and freight train operations was carried out using the noise measurements conducted of existing train operations. As previously mentioned, these measurements were conducted at five residential locations along the project alignment, some of which were near grade crossings to capture the sound of the train horns and grade crossing bells. The measurements were attended to note down the train passby details such as speed, direction, number of locomotives and cars. The future daily operations are presented in Table 3.10-6. The future train speeds with implementation of the Proposed Action are assumed to be the same as the existing train speeds.

Table 3.10-6
Daily Service Level Assumptions for Train Operations
(Oceanside to San Diego)

Operator	2012 Volume	2020 Volume	2025 Volume	2030 Volume	Growth (2012-2030)
Amtrak	22	26	32	36	14
Coaster	22	30	36	54	32
BNSF Freight	6	11	11	11	5
Total	50	67	79	101	51

Source: SANDAG, 2013d.

Noise and vibration land uses have been grouped into clusters that are represented by the four noise monitoring locations. Each cluster represents several residences in the same location. The rail tracks would be approximately the same distance from each building in a cluster and train speeds and other operational parameters are the same for sensitive receivers in the cluster. The locations of the clusters and buildings included in each cluster are shown in Figure 3.10-2 through Figure 3.10-4. The noise analysis considers the project-related change in train trips through the project area. Train trips are predicted to increase to 67 per day by the year 2020. This number of trains is approximately the capacity of the single-track configuration. With implementation of the Proposed Action and other double track projects in the 2013 Infrastructure Development Plan, it is expected that train traffic would increase to 101 trips per day by the year 2030. Noise predictions were developed for each land use cluster according to the methods described above and are presented in Table 3.10-7.

As shown in Table 3.10-7, the increase in noise levels associated with implementation of the Proposed Action would be below the FRA thresholds for the allowable increase in cumulative noise levels and would not result in any moderate or severe noise impacts. Train noise would increase at some locations primarily due to the forecast increase in train movements within the corridor. Another factor would be that the second track would move some train movements closer to some noise receptors. At Clusters R3, R5, R7, R8, R9, R12, R13, and R14, the Proposed Action would result in lower train noise when compared to the 2020 Future No-Build noise levels. Reduced train noise would be attributable

primarily to the project-related elimination of existing crossovers. Another factor would be that the second track would move some train movements further from some noise receptors. As such, the proposed 2030 Project noise levels would not exceed the FRA impact thresholds when compared to the 2020 No-build noise levels. Therefore, implementation of the Proposed Action would not result in any moderate or severe noise impacts.

Vibration Impacts

The potential vibration impact from rail operations was assessed based on the increase in the future train operations with the Proposed Action as compared to the existing conditions. If train operations are 3 Vibration Decibels (VdB) or higher than the existing vibration levels, an adverse impact would occur.

As previously mentioned, vibration measurements were conducted at five sites along the corridor at residences within close proximity to the existing tracks. These measured vibration levels were adjusted based on change in distance to determine the future vibration levels with the Proposed Action. The speed of the future train passbys is assumed to be the same as the existing train passbys.

Vibration predictions were developed for each land use cluster according to the methods described above and are presented in Table 3.10-9. At some locations, there would be an increase in vibration levels with implementation of the Proposed Action in the range of 0.4 to 0.8 VdB. At other locations, there is either no change or a decrease in vibration levels in the range of 0.4 to 10.3 VdB. These changes are due to the change in distance between the proposed double track and the existing residences. The largest decrease in vibration levels would occur at Clusters R7, R8, R12, R13, and R14 where existing crossover tracks would be removed. The vibration levels at the Carlsbad Santa Fe Depot site would result in no change with operation of the Proposed Action.

Since the vibration levels provided in Table 3.10-8 do not exceed the existing levels by the FRA threshold of 3 VdB or more at any of the residential or recreational receivers, implementation of the Proposed Action would not result in any adverse long-term operational vibration impacts.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing single-track would remain for this segment of the LOSSAN corridor. Noise and vibration levels from train operations would remain at the same levels, as they exist today, and would only increase as future train volumes increase to meet future demand. Therefore, there would be no noise or vibration impacts under the No Action Alternative. Note, that benefits of the Proposed Action including reduction in noise and vibration levels related to cross over removal and shifting of track away from some clusters would not occur under the No Action Alternative.

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Proposed Action would not result in any adverse noise or vibration impacts to sensitive receptors located along the project corridor. Therefore, no mitigation measures would be required. For analysis of the Proposed Action's noise and vibration construction impacts, please refer to Section 3.16.10 of this EA.

3.10.5 Impact Analysis of Mitigation Measures

No mitigation would be required; therefore, there would be no impacts resulting from mitigation.

SOURCE: ATS Consulting, 2014

9/12/16

Carlsbad Village Double Track EA

Sensitive Land Uses: Clusters R1 to R7

FIGURE 3.10-2

SOURCE: ATS Consulting, 2014

9/12/16

Carlsbad Village Double Track EA

Sensitive Land Uses: Clusters R8 to R10

FIGURE 3.10-3

SOURCE: ATS Consulting, 2014 9/12/16

Carlsbad Village Double Track EA

Sensitive Land Uses: Clusters R11 to R14, I-1

FIGURE 3.10-4

Table 3.10-7
Train Noise Impacts

Cluster No.	Land Use	Location	Number of First Row Units	Closest Noise Measurement Site	L_{dn} (dBA)						Mod.	Severe
					Existing Noise	2020 Future No-Build	2030 Future Build with Project	Change in 2020 No-Build with Project	FRA Impact Threshold [a]			
									Mod.	Severe		
R1	SFR/ MFR	West of ROW Cassidy to Kelly Streets	6 SFR 28 MFR	LT-2	64.1	66.7	66.8	0.1	1.50	3.86	No	No
R2	SFR/ MFR	East of ROW Cassidy to Kelly Streets	6 SFR 43 MFR	LT-1	68.2	68.2	68.3	0.1	1.15	3.04	No	No
R3	SFR/ MFR	West of ROW Kelly Street to Vista Way	6 SFR 12 MFR	LT-2	64.1	66.7	66.5	-0.2	1.50	3.86	No	No
R4	SFR/ MFR	East of ROW Kelly Street to Vista Way	21 SFR 25 MFR	LT-1	68.2	68.2	68.5	0.3	1.15	3.04	No	No
R5	SFR	West of ROW Vista Way to Eaton Street	9	LT-2	64.1	71.4	71.0	-0.4	1.50	3.86	No	No
R6	SFR/ MFR	East of ROW Vista Way to south of Eaton Street	10 SFR 4 MFR	LT-1	68.2	70.8	71.3	0.5	1.15	3.04	No	No
R7	MFR	West of ROW Eaton to Pacific Streets	7	LT-2	64.1	66.7	60.2	-6.5	1.50	3.86	No	No
R8	SFR	Mountain View Drive between Ocean Street and Pacific Avenue	4	LT-1	68.2	68.2	62.5	-5.7	1.15	3.04	No	No
R9	SFR/ MFR	West of ROW Beach to Christiansen Avenues	1 SFR 20 MFR	LT-3	59.5	62.1	62.0	-0.1	2.13	5.21	No	No
R10	MFR	West of ROW at Christiansen Avenue	2	LT-4	71.8	74.3	74.6	0.3	0.83	2.53	No	No
R11	SFR	Carlsbad Village Drive and Washington Street	1	LT-4	69.7	72.3	72.4	0.1	1.06	2.81	No	No
R12	MFR	West of ROW south of Oak Avenue	6	LT-4	69.7	72.3	66.3	-6.0	1.06	2.81	No	No
R13	MFR	West of ROW north of Pine Avenue at Washington Street	50	LT-4	68.3	76.9	70.7	-6.2	1.15	3.02	No	No
R-14	MFR	West of ROW south of Pine Avenue at Washington Street	32	LT-4	67.4	69.7	63.8	-5.9	1.21	3.18	No	No
I-1[b]	Church	West of ROW Carlsbad Village Drive	---	LT-4	71.2	71.2	71.2	0.0	2.45	5.56	No	No

Notes: [a] FRA impact threshold for Category 2 receivers is based on the increase over the future no-build.
[b] Cluster I-1 is a Category 3 land use. Noise Levels and FRA Impact Thresholds for this receptor are one-hour Leq (dBA).
Source: ATS Consulting, 2014.

Table 3.10-8
Train Vibration Impacts

Cluster No.	Land Use	Location	Number of First Row Units	Maximum Vibration Level (Vdb)			Impact
				Existing Vibration	Proposed Action	Increase from Existing to Proposed	
R1	SFR MFR	West of ROW Cassidy to Kelly Streets	6 SFR 28 MFR	68.6	68.6	0.0	No
R2	SFR MFR	East of ROW Cassidy to Kelly Streets	6 SFR 43 MFR	67.8	67.8	0.0	No
R3	SFR MFR	West of ROW Kelly Street to Vista Way	6 SFR 12 MFR	68.6	68.2	-0.4	No
R4	SFR MFR	East of ROW Kelly Street to Vista Way	21 SFR 25 MFR	67.6	68.0	0.4	No
R5	SFR	West of ROW Vista Way to Eaton Street	9	68.8	68.0	-0.8	No
R6	SFR MFR	East of ROW Vista Way to south of Eaton Street	10 SFR 4 MFR	67.8	68.6	0.8	No
R7	SFR	West of ROW Eaton to Pacific Streets	7	81.9	71.6	-10.3	No
R8	SFR	Mountain View Drive between Ocean Street and Pacific Ave	4	77.8	68.6	-9.2	No
R9	SFR MFR	West of ROW Beach to Christiansen Avenues	1 SFR 20 MFR	65.1	65.1	0.0	No
R10	SFR	West of ROW at Christiansen Avenue	2	74.6	75.4	0.8	No
R11	SFR	Carlsbad Village Drive and Washington Street	1	71.6	72.2	0.6	No
R12	SFR	West of ROW south of Oak Avenue	6	81.6	71.9	-9.7	No
R13	MFR	West of ROW north of Pine Avenue at Washington Street	50	79.5	69.5	-10.0	No
R-14	MFR	West of ROW south of Pine Avenue at Washington Street	32	78.0	68.0	-10.0	No
I-1	Church	West of ROW Carlsbad Village Drive	--	75.9	76.4	0.5	No

Source: ATS Consulting, 2014.

3.11 Parks and Recreational Areas

The information contained in this section is summarized from the *Pacific Surfliner Carlsbad Village Double-Track Project Land Use Technical Report* (BRG 2014d) and *Section 4(f) Evaluation* prepared by BRG Consulting, Inc. (BRG, 2017), provided as Appendices J and L, respectively, of this EA.

3.11.1 Regulatory Setting

3.11.1.1 Federal

Per FRA Procedures for Considering Environmental Impacts, impacts to recreational opportunities must be considered in an environmental assessment. In addition, where land is acquired with Federal grant money there should be evidence of consultation with the grantor agency.

3.11.1.2 Local

The Proposed Action would occur entirely within the existing ROW between the cities of Oceanside and Carlsbad. The General Plans for Oceanside and Carlsbad guide development within each respective city. In addition to the General Plan, the Carlsbad Village Master Plan and Design Manual guides development within the Village area of the City of Carlsbad. The City of Oceanside and the City of Carlsbad General Plans and Carlsbad Village Master Plan are discussed below. The Proposed Action would traverse two separate communities/cities within the project corridor.

City of Oceanside General Plan

For the City of Oceanside, the General Plan is "the primary source of long-range planning and policy direction that will be used to guide growth and preserve the quality of life within the City" (City of Oceanside, 2002). To address future growth and development, the General Plan includes goals, objectives, policies, and plans, which are used to guide future land use and development decisions. The Oceanside General Plan contains ten elements, adding Community Facilities, Hazardous Waste Management, and Military Reservation Elements to the seven State mandated elements.

The following objectives and policies from the City's Community Facilities Element are applicable to the Proposed Action:

1. To enrich the quality of life for all residents of Oceanside by providing adequate and accessible public park and recreation facilities, by providing constructive leisure opportunities, and by providing recreational experiences and programs that contribute to the total health of the individual while meeting the overall needs and desires of the community.
2. The City of Oceanside shall assist in the coordinated planning, development, and maintenance of unique regional amenities within and adjacent to the community. These amenities include the Buena Vista Lagoon. This regional recreational and open space amenity system shall be planned, developed and implemented in coordination with the existing system of parks throughout the City of Oceanside.

City of Carlsbad General Plan

The Carlsbad General Plan contains the seven mandatory general plan elements, and includes an Open Space, Conservation and Recreation element. Each element contains maps, figures, policy statements, over-arching goals, more specific objectives, implementing programs, and in some instances development standards (City of Carlsbad, 2013). City General Plan recreational areas are included on Figure 3.15-1 in this EA.

The following goals and policies from the City of Carlsbad's Open Space, Conservation and Recreation Element are applicable to the Proposed Action:

1. Maintain a diversified, comprehensive system of open space for outdoor recreation, including, but not limited to: parks; beaches; areas for organized sports; connecting corridors containing trails; water recreation areas (beaches, lagoons, lakes); unique conservation areas for nature study; and, semi-developed areas for camping.
2. Offer a wide variety of recreational activities and park facilities designed to encourage educational benefits and active or passive participation by users of all ages and interests.
3. Coordinate the planning of park facilities and trails with other recreation-oriented land uses such as open space.
4. Seek to preserve the environmental integrity, ecology, and character of special resource areas (lagoons).

Carlsbad Village Master Plan and Design Manual

The Carlsbad Village Master Plan and Design Manual is the City of Carlsbad's Official Statement of design, zoning and land use, and long-range development strategy policy in order to create a strong identity, revitalize the area, enhance the economic potential, and establish specific site development standards for the Village. It sets forth the zoning and allowed land uses for the Village, which is a special review area. It also sets forth the standards and criteria by which development shall proceed in the Village Area, as well as serves as a Master Plan for the Village Area and implements, and is consistent with, the General Plan. The General Plan references the Village Master Plan for details on development and implementation strategies within the Village Area to meet the goals and objectives of the General Plan for the Village Area.

3.11.2 Affected Environment

The Proposed Action is located within one-half mile of eleven parks and recreation areas, including property owned by the City of Oceanside, the City of Carlsbad, NCTD, the State of California, and the privately-owned Army & Navy Academy of Carlsbad. The railroad crosses through the Buena Vista Lagoon Ecological Reserve, which is owned and managed by CDFW, in association with the Buena Vista Lagoon Foundation, and Buena Vista Audubon Society (City of Carlsbad, 2013). Directly north of the Carlsbad Boulevard bridge are two parcels owned by the City of Carlsbad (APN 155-200-01, -13) that are adjacent to the CDFW-owned Reserve area. Although they are not officially part of the Buena Vista Lagoon Ecological Reserve, they are zoned for open space preservation.

Table 3.11-1 on the following page lists all park and recreation areas within one half mile of the Proposed Action.

3.11.3 Environmental Consequences

3.11.3.1 Parks and Recreational Impacts

Proposed Action

There is a total of approximately 174 acres of park and recreational opportunities, including open space within one-half mile of the Proposed Action. However, all park and recreational lands, is outside the Proposed Action's permanent and temporary impact area.

Table 3.11-1
Park and Recreation Areas Within Project Vicinity

Assessor's Parcel Number (APN)	Acreage	Description	Owner
153-011-06	10.40	Buccaneer Park (Oceanside)	City of Oceanside
153-093-03	0.35	Lions Club Park (Oceanside)	NCTD
155-200-08	0.94	Maxton Brown Park (Carlsbad)	City of Carlsbad
203-054-30, 203-054-31, 203-054-32, 203-054-33	5.49	Army & Navy Academy Athletic Fields (Carlsbad)	Army & Navy Academy
203-142-04	2.06	Magee Park (Carlsbad)	City of Carlsbad
204-310-01	16.50	Carlsbad State Beach (Carlsbad)	State of California
204-100-05	7.10	Pine Avenue Park (Carlsbad)	City of Carlsbad
204-193-01	2.73	Chase Field (Carlsbad)	City of Carlsbad
205-111-26, 205-111-27, 205-111-17, 205-111-24	5.97	Holiday Park (Carlsbad)	City of Carlsbad
155-200-01, 155-200-13	1.16	Designated Open Space (Carlsbad)	City of Carlsbad
155-072-14, 155-101-66, 155-130-24, 155-130-27, 155-130-37, 155-130-29, 155-140-29, 155-140-33, 155-140-34, 155-190-09, 155-190-12, 155-221-10, 203-010-18	120.90	Buena Vista Lagoon Ecological Reserve (Carlsbad and Oceanside)	California Department of Fish and Wildlife
Total	173.60		

Source: SanGIS, 2013

Rotary Park was a City of Carlsbad public park located southwest of the existing railroad alignment between Grand Avenue and Carlsbad Village Drive. The former park is approximately one acre and lies entirely within the existing railroad ROW on land owned by NCTD. This former park is not included in the City of Carlsbad's recreational element of the General Plan and is thus no longer designated for recreational use. The parkland was formerly leased to the City of Carlsbad but the lease has subsequently been released. The site is not a park.

There would be no direct impacts to nearby parks, that is, there will be no physical encroachment onto other park property. Two other parks may be indirectly impacted by construction noise and vibration. These include Lions Club Park in Oceanside located adjacent to the northern limits (within NCTD owned railroad ROW) of the Proposed Action, and the Army and Navy Academy's athletic fields in Carlsbad.

Noise and vibration are mitigated to minimize adverse impacts as documented in Section 3.10. Visual and access impacts are minimized because the construction is temporary in nature and construction will be planned to minimize park access disruptions. The Proposed Action is thus consistent with the Carlsbad and Oceanside General Plan as it pertains to the Park and Recreation Element.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing conditions would remain as they exist today. As such, there would be no temporary construction noise or vibration impacts to the Lions Club Park (NCTD owned railroad ROW) in Oceanside or the Army and Navy Academy athletic fields in Carlsbad. Therefore, there would be no impacts to parks and recreational areas.

3.11.3.2 Open Space Impacts

Proposed Action

A total of approximately 100 acres of the Buena Vista Lagoon Ecological Reserve (and adjacent City of Carlsbad designated open space land) is within one-half mile of the project footprint. However, because the Proposed Action's permanent and temporary footprint does not encroach on this land, there would be no direct impacts. Construction of the new double track bridge over Buena Vista lagoon would be limited to the NCTD ROW. Temporary construction noise impacts could adversely affect open space utilization by recreationalists within the Ecological Reserve. Use by recreationalists is limited by CDFW to wildlife viewing, hiking, and fishing. However, implementation of avoidance and minimization measures outlined in Section 3.3 Biological Resources will minimize adverse impacts to the open space and its recreational users by restricting construction operations during certain seasons and maintaining access to the limited CDFW allowable uses.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing conditions would remain as they exist today. Therefore, there would be no impacts to open space areas.

3.11.4 Avoidance, Minimization, and/or Mitigation Measures

Temporary construction impacts to two park and recreation areas would be minimized through implementation of noise and construction avoidance and minimization measures as outlined in Section 3.10 and 3.16.11. Therefore, the Proposed Action would not result in any adverse impacts to parks and recreational areas.

3.11.5 Impact Analysis of Mitigation Measures

There would be no adverse impacts to parks and recreational areas resulting from implementation of the Proposed Action and no mitigation measures are required; therefore, there would be no impacts resulting from mitigation.

3.12 Public Health and Safety

The information provided in the Public Health and Safety section of this EA was prepared by BRG Consulting, Inc. for the *Carlsbad Village Double Track Project,* and summarized from the *Utility Impacts Report* (T.Y. Lin, 2014d), provided as Appendix M of EA.

3.12.1 Regulatory Setting

Federal regulations govern the design and safety and security of rail transportation systems. The Proposed Action would be designed in accordance with applicable federal laws and regulations, including applicable FRA and US Department of Homeland Security Transportation Security Administration (TSA) regulations.

NCTD is the owner and operator of the railroad throughout the study area and is responsible for the safety and security of existing railroad facilities.

3.12.2 Affected Environment

3.12.2.1 Emergency Services

Emergency services are provided to the project area by the cities of Carlsbad and Oceanside, as well as the San Diego County Sheriff's Department. The locations of emergency service facilities are shown on Figure 3.12-1.

Fire Protection

The Carlsbad Fire Department is the first response emergency provider for the portions of the project site that lie in the City of Carlsbad, responding to fires and medical emergencies with its trained paramedic staff. Fire Station 1, located at 1275 Carlsbad Village Drive, provides primary fire protection and emergency medical services to the portions of the project area occurring within the City of Carlsbad. Station 1 is staffed with a total crew of five, including one Captain, one Engineer, and three firefighters/paramedics. Apparatus at the station consists of one fire engine and one paramedic ambulance.

The Oceanside Fire Department is the first response emergency provider for the portions of the project site that lie in the City of Oceanside, responding to fires and medical emergencies with its trained paramedic staff. Fire Station 2, located at 1740 South Ditmar Street, provides primary fire protection and emergency medical services to the portions of the project area occurring within the City of Oceanside. The Oceanside Fire Department has a staff of over 100 sworn personnel, with an additional staff of approximately 30 to provide support to the community.

Police Protection

The San Diego Sheriff's Department Coaster/Railroad Enforcement Unit operates out of the San Diego Sheriff's Encinitas Station and provides contracted law enforcement services for the NCTD's 62 miles of rail lines. The unit provides security along the railroad ROW as well as on the commuter trains themselves.

The Carlsbad Police Department, which operates from the Safety Center located at 2560 Orion Way, provides all law enforcement services to the project area occurring within the City of Carlsbad, including patrol, traffic and parking enforcement, criminal investigations, crime prevention, and juvenile services. Carlsbad has adopted a standard of a maximum six-minute response time for police service on priority-one emergency calls (City of Carlsbad, 2013).

SOURCE: BRG Consulting, Inc., 2016 9/12/16

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Emergency Service Locations

FIGURE 3.12-1

According to the City's General Plan, Police service (or the number of officers serving the City) is based upon actual workload measures, including response times, travel times, type of service, number of calls for service, and the time of day that calls are received.

The Oceanside Police Department, located at 3855 Mission Avenue, provides all law enforcement services to the project area occurring within the City of Oceanside, including patrol, traffic enforcement, harbor police, school safety, crime prevention, and crime investigations. The Oceanside Police Department is divided into four sectors, with each sector serving a different portion of the City. Sector 1 serves the area of the project site.

3.12.2.2 Utilities

Public utilities provided to the project area include water, wastewater, energy, and communications.

Water for the project area is provided by the Carlsbad Municipal Water District and City of Oceanside Water Utilities Department, imported by the Metropolitan Water District of Southern California (MWD), from the Colorado River and the California Aqueduct system.

The City of Carlsbad and Oceanside Wastewater Divisions provide wastewater services to the project area. Carlsbad's wastewater is delivered to the Encina Wastewater Authority, where it is treated and released into the ocean. Oceanside's wastewater is treated and disposed at the San Luis Rey Wastewater Treatment plant and the La Salina Wastewater Treatment Plant. The La Salina Treatment Plant serves the project area. The existing regional sewer system consists of collection and interceptor sewers; force main pipelines; various pump stations; water reclamation plants; outfall pipes; and, sludge drying beds.

San Diego Gas and Electric (SDG&E) provides gas and electricity service to the project area, while Southern California Gas Company also provides gas service. Energy that is provided throughout California, including to the project area, is generated by numerous power plants that are located within and outside the State. Electricity and natural gas are supplied to SDG&E via the electric grid, transmission lines, and distribution lines.

Communication lines run through the area overland and underground. Coaxial and fiber optics cables are located either underground or share overhead lines that cross over the project area with SDG&E power lines. Telecommunication services are provided to the project area by AT&T, Cox Communications, Crown Castle International, Time Warner Cable, and Verizon.

3.12.2.3 Schools

The Carlsbad and Oceanside Unified School Districts provide public educational services, grades K-12, to the project area. Although the Proposed Action is located primarily within a residential area, there are no public schools located within one-half mile of the Proposed Action. Only the Army and Navy Academy, a private college preparatory boarding school for boys for grades 7-12, located at 2605 Carlsbad Boulevard in the City of Carlsbad, is located within one-half mile of the project area.

3.12.2.4 Hospitals

In the City of Carlsbad, there are two urgent care centers located within one-half mile of the Proposed Action that would provide medical services to the project area:

- Carlsbad Urgent Care – 2804 Roosevelt St, Carlsbad, CA 92008
- Mission Urgent Care – 2690 Roosevelt St, Carlsbad, CA 92008

In the City of Oceanside, there are no hospitals or other medical care facilities located within one-half mile of the Proposed Action that would provide medical services to the project area.

3.12.3 Environmental Consequences

3.12.3.1 Emergency Services

Proposed Action

The Proposed Action does not contain a residential component that would increase population in the area and consequently increase the need for additional fire or police protection services. The operational occupancy for the Proposed Action is limited to a few maintenance employees that currently maintain the tracks. In addition, the existing use for the project area, which is a railroad track that provides rail service to the region, would not change with the Proposed Action.

It is expected that the existing single-track railroad can support projected train trips through approximately the year 2020, which is 67 daily train trips. With completion of the Proposed Action, it is expected that train trips will increase to 101 trips per day, an increase of 34 trips per day (SANDAG, 2013d). The City of Carlsbad has expressed concerns for increased project-related delay at the Grand Avenue and Carlsbad Village Drive grade crossings. Presently, a southbound Coaster Train triggers the crossing gates at Grand Avenue and Carlsbad Village Drive as it approaches the railroad station. The gates remain down during the loading and unloading of passengers and as the train starts back up and crosses through the two grade crossings. It is only after the train passes through the Carlsbad Village Drive crossing that the gates come up. This is not the case for northbound Coasters. For northbound Coasters, the gates come back up after the train crosses through the Grand Avenue crossing. SANDAG is investigating changes to the signaling that would allow the gates to remain up while southbound Coasters load and unload. The gates would only be triggered after the train starts back up, just before it crosses through the two grade crossings. This improvement, if feasible, will substantially reduce existing and projected delays at the Grand Avenue and Carlsbad Village Drive grade crossings, improving public safety access across the tracks. In addition, the Proposed Action includes improvements to medians and the installation of pedestrian crossing gates to further improve public safety in this area of downtown Carlsbad.

For these reasons, fire emergency service response times from Carlsbad Fire Department Station 1 and Oceanside Fire Department Station 2 would not be affected substantially by construction or operation of the Proposed Action. In addition, police service response times from the Carlsbad Police Department Safety Center or the Oceanside Police Department Station would not be affected substantially by construction or operation of the Proposed Action. Furthermore, the Sheriff's Coaster/Railroad Enforcement Unit would continue to provide law enforcement to the railroad

ROW. Therefore, no substantial adverse impacts to fire or police services would occur as a result of the Proposed Action.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing conditions would remain as they exist today. As such, existing fire and police services would continue to service the area. Therefore, there would be no impact to emergency services.

3.12.3.2 Utilities

Proposed Action

The current operation of the existing railroad track does not generate any substantial amount of wastewater. Expansion of service would result in a minor increase of wastewater generation by additional train ridership. There is not expected to be a noticeable change in wastewater generation because the train riders would otherwise ride in cars or busses to reach their destination. In addition, the Proposed Action area would continue to be provided water, electricity, and communications by the same utility companies that currently service the City of Carlsbad and Oceanside. However, a number of utility lines (i.e. sewer, gas, storm drain, transmission) would need to be relocated to accommodate some of the components of the Proposed Action. A summary of utility impacts is provided below in Table 3.12-1.

Table 3.12-1
Utility Impact Summary

Owner	Utility Description	Utility Conflict/Work Description	Resolution
City of Carlsbad	10-inch VCP Sewer	Pedestrian Underpass Construction	Relocate Sewer Line
City of Carlsbad	18-inch RCP Storm Drain	Pedestrian Underpass Construction	Relocate Storm Drain
City of Carlsbad	Street Light and Pull Box	Pedestrian Underpass Construction	Relocate Street Light and Pull Box
City of Carlsbad	18-inch RCP Storm Drain & Type B Inlet	Platform Construction	Relocate Storm Drain
City of Carlsbad	Street Light and Pull Box	At-grade Crossing Construction	Relocate Street Light and Pull Box
CMWD	1-inch Irrigation Service	Relocation of Crossing Arm	Relocate Irrigation Service
SC Gas Co.	12-inch HP Gas Line	Pedestrian Underpass Construction	Relocate 12-inch HP Gas Line
SDG&E	1-inch Gas in 3-inch Casing	At-grade Crossing Construction	Extend Casing & Protect-in-place
Verizon	Underground Fiber Optic in 2.375 inch HDPE	Track Shift	Relocate Fiber Optic Transmission Line from Under Tracks
Verizon	Underground Fiber Optic in 2.375 inch HDPE	Bridge Replacement and Grading for Track Raise	Relocate Fiber Optic Transmission Lines to New Bridge, and Raise with Grading
Verizon	Underground Fiber Optic in 2.375 inch HDPE	Inter-track Fence & Pedestrian Undercrossing Construction	Relocate Fiber Optic Transmission Line from Under Inter-track Fence

Note: VCP=Vitrified Clay Pipe, RCP=Reinforced Concrete Pipe, HP=High Pressure, HDPE=High Density Polyethylene.
Source: T.Y. Lin International, 2014d.

The final resolution of each conflict identified in Table 3.12-1 will be determined at a later phase of the Proposed Action after potholing, or the digging of test holes, is completed and the design is finalized. Potholing will determine exact locations of utilities and also show the length of existing casing for some of the pipes. The information acquired by potholing would be used to determine exact relocation lengths and locations. However, it can be expected that all

affected utility lines would be relocated within proposed impact area. Therefore, implementation of the Proposed Action would not result in any adverse impacts to utilities.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing conditions would remain as they exist today. Therefore, there would be no adverse impact to utilities.

3.12.3.3 Schools

Proposed Action

The Proposed Action does not contain a residential component that would increase population in the area and consequently increase the need for additional school facilities. In addition, there are no Carlsbad or Oceanside Unified School District schools located within one-half mile of the Proposed Action. Therefore, there would be no impact to schools resulting from implementation of the Proposed Action.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing conditions would remain as they exist today. Therefore, there would be no adverse impact to schools.

3.12.3.4 Hospitals

Proposed Action

The Proposed Action does not contain a residential component that would increase population in the area and consequently increase the need for additional medical facilities. The Carlsbad and Mission Urgent Care centers would continue to provide medical services to the project area located within the City of Carlsbad. Therefore, there would be no impact to hospitals or other medical facilities resulting from implementation of the Proposed Action.

No Action Alternative

Under the No Action Alternative, no development would occur and the existing conditions would remain as they exist today. Therefore, there would be no adverse impact to hospitals.

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Proposed Action would not have an adverse impact on public health and safety, and existing public services would continue to sufficiently serve the project area. Therefore, no mitigation is required.

3.12.5 Impact Analysis of Mitigation Measures

There would be no adverse impacts to public health and safety resulting from implementation of the Proposed Action, and no mitigation measures are required; therefore, there would be no impacts resulting from mitigation.

3.13 Relocation Impacts

The information provided in this section is summarized from the *Community Impact Assessment for the Pacific Surfliner Carlsbad Village Double-Track Project* prepared by BRG Consulting (BRG, 2014b) (Appendix D of this EA).

3.13.1 Regulatory Setting

3.13.1.1 Federal

Uniform Relocation Assistance and Real Property Acquisition Policies Act [42 U.S.C. Chapter 61]

The Caltrans Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 CFR Part 24. The purpose of RAP is to ensure that persons displaced because of a federal action or an undertaking involving federal funds are treated fairly, consistently, and equitably so that such persons would not suffer disproportionate impacts as a result of projects designed for the benefit of the public as a whole.

3.13.2 Affected Environment

The Proposed Action is located entirely within the existing railroad ROW between Cassidy Street in Oceanside and Pine Avenue in Carlsbad. The community surrounding the ROW within the Oceanside portion of the Proposed Action is exclusively residential, composed of apartment buildings and single-family residences. The land adjacent to the Buena Vista Lagoon is public open space offering passive recreation. Within the Carlsbad portion, there is a greater mixture of land uses, including restaurants, office, commercial and educational facilities, apartment buildings, condominiums, and single-family residences, all contributing to the "Village" character. The Proposed Action would not encroach on any land outside the railroad ROW, and therefore no additional land acquisition would be required.

3.13.3 Environmental Consequences

3.13.3.1 Permanent Impacts

Proposed Action

Implementation of the Proposed Action would not result in any adverse relocation impacts, as it would be constructed entirely within the existing railroad ROW with no property acquisition required.

No Action Alternative

Implementation of the No Action Alternative would not result in any adverse relocation impacts, as it would maintain the existing railroad alignment with no property acquisition required.

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action would not result in adverse relocation impacts. Therefore, no mitigation measures are required.

3.13.5 Impact Analysis of Mitigation Measures

Since the implementation of the Proposed Action would not result in any relocation impacts, no mitigation measures are required and no impacts of mitigation would occur.

3.14 Water Quality and Water Resources

The information provided in this section is summarized from the *Draft Preliminary Drainage Study* for the Carlsbad Village Double Track Project (T.Y. Lin, 2014b), and the *Draft Preliminary Storm Water Management Plan* for the Carlsbad Village Double Track Project (T.Y. Lin, 2014c), both prepared by T.Y. Lin International. These reports are provided as Appendices I1 and N, respectively, of this EA.

3.14.1 Regulatory Setting

Water resources are regulated by federal, state, regional, and local agencies.

Clean Water Act

The Federal CWA is the principal statute governing water quality and established the basic framework for regulating the discharge of pollutants into the nation's waters, through a permit system known as the NPDES. The EPA is given the authority to implement pollution control programs. The NPDES program requires permits for the discharge of pollutants from any point source (including stormwater discharges) into WoUS. As defined in the CWA, WoUS applies only to surface waters, rivers, lakes, estuaries, coastal waters, and wetlands. The authority to implement the NPDES program is generally delegated to individual States. In the case of San Diego County, the authority is delegated to the State Water Resources Control Board (SWRCB) and the San Diego RWQCB, which is Region IX.

Section 303

Section 303(d) of the CWA requires states, territories and authorized tribes to develop a list of water quality limited segments. The waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish a priority ranking for water on the lists and develop action plans to improve water quality.

Section 401

Section 401 of the CWA requires that any activity which may result in a discharge into WoUS must be certified by the SWRCB as administered by the local RWQCB. This certification ensures that the Proposed Action does not violate Federal water quality standards.

Section 402

Section 402 of the CWA established the NPDES, which requires permits for discharges of pollutants from certain point and non-point sources into WoUS. The CWA allows the EPA to delegate NPDES permitting authority to states with approved environmental regulatory programs. The NPDES permit applicable to this project is the General Construction Permit (Permit No. CAS000002) and the General Municipal Separate Storm Sewer System (MS4) Permits of the affected Jurisdictions.

North County Transit District - On February 5, 2013 the final draft of the Phase II Small MS4 General Permit (Order No. 2013-001-DWQ) was adopted and became effective on July 1, 2013. NCTD was included as a Non-Traditional MS4 Permitee. NCTD has not yet implemented a stormwater program to comply with the new permit.

City of Carlsbad - The City of Carlsbad Standard Urban Stormwater Management Plan (SUSMP) complies with the MS4 permit for the San Diego Region (Order No. 2013-001-DWQ) and most of the impervious area within the project

limits discharge to City of Carlsbad storm drains, therefore the City of Carlsbad SUSMP was utilized for the entire project.

The City of Carlsbad SUSMP identifies stormwater treatment requirements and minimum stormwater standards that apply to new development and redevelopment projects in the City of Carlsbad (City of Carlsbad, 2011). These include minimum standards for Low Impact Development (LID), BMPs, and the requirement of the preparation of a Stormwater Management Plan (SWMP).

Section 404

Section 404 of the CWA regulates the discharge of dredged, excavated, or fill materials into wetlands, streams, rivers, and other WoUS. The USACE is the federal agency authorized to issue 404 Permits for certain activities conducted in wetlands or other U.S. waters. Section 404 Permits are not granted without Section 401 certification.

The Rivers and Harbors Act of 1899

The Rivers and Harbors Act, enacted by Congress in 1899 was the first federal water pollution act in the United States. It focuses on protecting navigation, protecting waters from pollution, and acted as a precursor to the CWA of 1972.

Section 10 The Rivers and Harbors Act of 1899

Section 10 of the River and Harbors Act of 1899 (33 USC 403) regulates dredging and filling in “Navigable Waters” and may apply to activities within the lagoon.

3.14.2 Affected Environment

The project area is located within the Carlsbad HA (904.20) and the Agua Hedionda HA (904.30), which are within the Carlsbad Hydrology Unit (904.00). The receiving waters for the project area are two coastal waters: the Buena Vista Lagoon to the north and Agua Hedionda Lagoon to the south. The majority of the project drains into Buena Vista Lagoon. According to the 2010 303(d) list approved by the SWRCB (USEPA, 2010), both Buena Vista Lagoon and Agua Hedionda Lagoon are 303(d) listed impaired water bodies.

There are two swales on either side of the tracks at the north end of the project that flow directly into the Buena Vista Lagoon. The NCTD ROW in this area is unpaved. To the south, Washington Street and its surrounding parcels, the Army and Navy Academy Athletic Field, and the NCTD ROW west of the tracks drains along a trackside ditch that flows in the Buena Vista Lagoon. The remaining portion of the station parking lot and the station itself drain into a 66-inch storm drain owned by the City of Carlsbad that flows into Buena Vista Lagoon. In addition, project runoff is collected within the 84-inch RCP along the east side of the track at Walnut Ave and discharges into Agua Hedionda Lagoon to the south.

The pollutants of concern that are anticipated or can potentially exist at the project site are most likely trash & debris, oil, pesticides, and nutrients, but may also include sediment, heavy metals, organic compounds, oxygen demanding substances, oil & grease, and bacteria & viruses.

3.14.3 Environmental Consequences

Proposed Action

The Proposed Action would not substantially alter the drainage patterns in the area but may generate pollutants of concern.

A preliminary analysis revealed that a bio-swale can be constructed along the north end of the east platform and the track. This location was selected due to the available land space while following the existing drainage flow pattern into the Buena Vista Lagoon and the accessibility of the site for maintenance. In addition, preliminary analysis revealed that a bioretention swale could be constructed along the curb and sidewalk on the northeast side of the parking lot. A bioretention basin in this location fits within the available land space with minimal impacts to the parking lot configuration while following the existing drainage flow pattern that conveys stormwater runoff to the existing inlet at the northeast of the platform. This location would provide treatment of runoff from the existing parking lot in an equivalent area to the replaced and newly constructed impervious area. This is more beneficial than treating the platform area only because the parking lot is a greater threat for stormwater pollution.

To help ensure optimal water quality during project construction and operation, BMPs would be implemented, as required by the City of Carlsbad SUSMP and as detailed in the Draft Preliminary Storm Water Management Plan (T.Y. Lin, 2014c). These include Standard Site Design BMPs (e.g. minimize impervious surfaces, drain into vegetated ditches, prevent erosion control), Source Control BMPs (e.g. mark storm drain inlets, landscape with and preserve existing native vegetation), LID BMPs (e.g. preserve natural drainage features, use pervious surfaces), and Treatment Control BMPs (e.g. construction of bioretention swale).

The SUSMP requires hydromodification measures for PDPs to ensure that post-development peak flows do not exceed predevelopment peak flows. However, because the Proposed Action is a PDP that would drain directly to a lagoon, the project is hydromodification exempt. North of Oak Avenue in Carlsbad, all drainage from the project flows into Buena Vista Lagoon, which exists in a freshwater condition due to a weir located at the mouth of the lagoon. The site runoff reaching the lagoon would also be freshwater and thus would not impact the freshwater/saltwater balance of the lagoon. Additionally, there is heavy vegetation along the banks of the lagoon that would provide protection from erosion, and riprap energy dissipators would be constructed at the discharge points to mitigate 100-year stormwater runoff velocities. South of Oak Avenue, drainage flows within a storm drain to Agua Hedionda Lagoon. There is no anticipated increase in runoff to Agua Hedionda Lagoon, and therefore, there would be no impact to the salinity of the lagoon.

Because the Proposed Action would create 5,000 square feet or more of impervious surface over the entire project site, it would qualify as a Priority Development Project (PDP) and therefore require a SWMP implementing structural BMPs to be submitted at the time of application. However, because the project would result in the replacement of impervious surface in an amount less than 50% of the surface area of the previously existing development, the project would only require BMPs for the area of replaced or newly constructed pavement. These BMPs are detailed in the Draft Preliminary Storm Water Management Plan prepared (T.Y. Lin, 2014c).

No Action Alternative

Under the No Action Alternative, no development related activities, including construction, would occur. The project area would remain as it exists today; therefore, there would be no impact to water quality.

3.14.4 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action is not anticipated to create adverse impacts to water quality. Drainage patterns and drainage amounts will be similar to pre- and post- Proposed Action. Through the construction of a bioswale and implementation and maintenance of standard BMPs, adverse impacts to water quality will be avoided or minimized. Therefore, no mitigation is required for either project alternative.

3.14.5 Impact Analysis of Mitigation Measures

Since the implementation of the Proposed Action would not result in any anticipated impacts to water quality, no mitigation measures are required and there would be no impacts of mitigation.

3.15 Section 4(f) and 6(f) Evaluation

The information provided in this section is a summary of the information provided as Appendix L, *Pacific Surfliner Carlsbad Village Double-Track Project Section 4(f) Evaluation*, prepared by BRG Consulting, Inc. (BRG, 2017). The full Section 4(f) Evaluation contains a more detailed analysis of impacts to Section 4(f) resources, including figures and impact tables.

Information on Land and Water Conservation Fund (LWCF) Act Section 6(f) resources is summarized from research at the Land and Water Conservation Fund website (http://waso-lwcf.ncrc.nps.gov/public/index.cfm), review of Wildlife Conservation Board Meeting Minutes (https://wcb.ca.gov/Board-Actions) and communication with the CDFW South Coast Region.

3.15.1 Regulatory Setting

Section 4(f)

SANDAG anticipates seeking Federal financial assistance for the Proposed Action from the FRA. Such financial assistance would be an approval subject to Section 4(f). Section 4(f) protects public parklands and recreational lands, wildlife refuges, and historic sites of national, state, or local significance, commonly referred to as Section 4(f) properties or resources. The FRA may not approve the use of a Section 4(f) property unless the FRA determines the following:

1. There is no prudent and feasible alternative to the use of the land from the property;
2. The program or project includes all possible planning to minimize harm to the property resulting from the use, or;
3. The administration determines that the use of the property, including any measures to minimize harm committed by the applicant, would have a *de minimis* impact, as defined in Section 774.17 on the property.

The “use” of a protected Section 4(f) property occurs when any of the conditions described below are met. A “use” of properties protected under Section 4(f) may be:

4. Permanent, where 4(f) resources are permanently incorporated into a proposed transportation facility;
5. Temporary, where 4(f) resources are not permanently incorporated into a transportation facility, but there is a temporary occupancy of property that is considered adverse in terms of the preservationist purposes of the Section 4(f) statute;
6. Constructive, where a transportation project does not permanently incorporate land from the resource, but the proximity of the project results in impacts that are so severe that the protected activities, features, or attributes that qualify the resource for protection under Section 4(f) are substantially impaired.

When a project would need to use a minor amount of Section 4(f) protected property, FRA can make a de minimis impact determination. A de minimis impact determination may be made for a permanent incorporation or temporary occupancy of Section 4(f) property. Such findings must include sufficient supporting documentation to demonstrate that the impacts, after avoidance, minimization, mitigation, or enhancement measures are taken into account, are de minimis and that the required coordination has been completed.

According to 49 USC 303(d), the following criteria must be met to reach a de minimis impact determination:

- For parks, recreation areas, and wildlife and waterfowl refuges, a de minimis impact determination may be made if a transportation project would not adversely affect the activities, features, and attributes qualifying the property for protection under Section 4(f) after mitigation. In addition, to make a de minimis impact determination, there must be public notice (with opportunity for public review and comment), and written concurrence received from the officials with jurisdiction over the property.
- For a historic site, a de minimis impact determination may be made only if, in accordance with the Section 106 process of the NHPA, it is found that the transportation program or project would have no effect or no adverse effect on historic properties and FRA has received written concurrence from the State Historic Preservation Office (SHPO).

If there is a 4(f) use that is not de minimis, then the agency must evaluate whether there are "feasible and prudent" avoidance alternatives to the use of the property, and if not, then it must undertake all possible planning to minimize harm to the property.

Section 6(f)

The LWCF Act protects property acquired or developed with LWCF grant funding from conversions from public outdoor recreation use. Specifically, Section. 6(f)(3) states, "No property acquired or developed with assistance under this section shall, without the approval of the Secretary, be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location."

3.15.2 Affected Environment

3.15.2.1 Section 4(f)

Parks, Recreation Areas, and Wildlife and Waterfowl Refuges

A park or recreation area qualifies for protection under Section 4(f) if it (1) is publicly owned, (2) is open to the general public, (3) is being used for recreation, and (4) is considered significant by the authority with jurisdiction.

A wildlife or waterfowl refuge qualifies for protection under Section 4(f) if it (1) is publicly owned, (2) is being used as a refuge, and (3) is considered significant by the authority with jurisdiction.

As shown on Figure 3.15-1, the Proposed Action is located within one-half mile of eight publicly-owned parks and recreation areas, including property owned by the City of Oceanside, the City of Carlsbad, and the State of California. The privately-owned athletic fields (Army & Navy Academy of Carlsbad) and Lion's Club Park (completely within the rail ROW and owned by NCTD) are shown on the figure (along with Rotary Park) but do not qualify as 4(f) resources. Therefore, omitting these properties, there are 166.6 acres of 4(f) resources as compared to 173.6 acres of park and recreation areas (see Table 3.11-1). At the Buena Vista Lagoon, the Proposed Action is adjacent to the

SOURCE: Esri, 2013; SanGIS, 2013; ASM Affiliates, 2013; T.Y. Lin, 2013

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Land Evaluated for 4(f) Eligibility

FIGURE 3.15-1

Buena Vista Lagoon Ecological Reserve, which is owned and managed by the CDFW, in association with the Buena Vista Lagoon Foundation, and Buena Vista Audubon (City of Carlsbad, 2013). Directly north of the Carlsbad Boulevard bridge are two parcels owned by the City of Carlsbad (APN 155-200-01, -13) that are adjacent to the CDFW-owned Reserve area. These parcels are not officially part of the Buena Vista Lagoon Ecological Reserve and are not identified as core or conserved lands in the City of Carlsbad's Habitat Management Plan (City of Carlsbad, 2004). They are designated in the Carlsbad General Plan (City of Carlsbad, 2013) as open space preservation of natural resources. However, the majority of the land comprising these parcels are mapped as urban/developed (parking lot with structures), non-native vegetation and disturbed coastal sage scrub (Merkel and Associates, Inc., 2016). Since these parcels are not being managed as conserved lands and due to their developed/disturbed nature their current use is not for refuge activities, they are not considered a 4(f)-protected refuge resource for the purposes of this evaluation.

All lands within one-half mile of the Proposed Action that qualify as parklands, recreation areas, or wildlife or waterfowl refuges that may qualify for protected under Section 4(f) are listed in Table 3.15-1.

Table 3.15-1
Section 4(f) Parks, Recreation Areas, and Refuges Within Project Vicinity

APN	Acreage	Description	Owner
153-011-06	10.40	Buccaneer Park (Oceanside)	City of Oceanside
155-200-08	0.94	Maxton Brown Park (Carlsbad)	City of Carlsbad
203-142-04	2.06	Magee Park (Carlsbad)	City of Carlsbad
204-310-01	16.50	Carlsbad State Beach (Carlsbad)	State of California
204-100-05	7.10	Pine Avenue Park (Carlsbad)	City of Carlsbad
204-193-01	2.73	Chase Field (Carlsbad)	City of Carlsbad
205-111-26, 205-111-27, 205-111-17, 205-111-24	5.97	Holiday Park (Carlsbad)	City of Carlsbad
155-072-14, 155-101-66, 155-130-24, 155-130-27, 155-130-37, 155-130-29, 155-140-29, 155-140-33, 155-140-34, 155-190-09, 155-190-12, 155-221-10, 203-010-18	120.90	Buena Vista Lagoon Ecological Reserve	California Department of Fish and Wildlife (CDFW)
Total	166.60		

Source: SanGIS, 2013

Historic/Cultural Resources

A historic site or cultural resource eligible for, or listed in, the NRHP may qualify for protection under Section 4(f) if land from the site is permanently or temporarily incorporated into the project. If a project does not physically take (permanently incorporate) the historic site or cultural resource, but causes an adverse effect, the proximity impacts must be evaluated to determine if the proximity impacts would substantially impair the features or attributes that contribute to the NRHP eligibility of the historic site or cultural resource. While the statutory requirements of Section 106 and Section 4(f) are similar, even if a Proposed Action results in an "adverse effect" under Section 106, there would not automatically be a Section 4(f) "use" absent a separate analysis and determination by FRA.

Prior to completing this Section 4(f) evaluation, an NHPA Section 106 analysis was prepared that identified historic architectural and archaeological resources in the historic architectural and archaeological APEs to determine their significance. For more detailed information on this process, refer to the Cultural Resources Technical Report in Appendix F of this EA (ASM Affiliates, 2013).

The report identified no historic resources within the direct impacts APE. However, it did identify seven historic resources within the indirect APE that are listed or recommended eligible for listing on the NRHP. These resources are listed below in Table 3.15-2. The preliminary and conservative determinations are subject to the review and concurrence by the SHPO, and are considered preliminary until SHPO has concurred. Consultation with the SHPO regarding the eligibility of historic resources and determination of effects will be conducted concurrently with public review of this EA. On August 3, 2017, FRA sent a letter to SHPO formally initiating the consultation under Section 106.

Table 3.15-2
Eligible Historic Properties within the Indirect APE

NRHP Site Number	Description	Recommended as Eligible Under NRHP Criteria*
NR 93001016	Carlsbad Santa Fe Depot, Carlsbad	A, C
N/A	116 Eaton St., Oceanside	A, C
N/A	1920 S. Broadway St., Oceanside	A
N/A	417 Carlsbad Village Dr., Carlsbad	A
N/A	457 Carlsbad Village Dr., Carlsbad	A
N/A	3077 State St., Carlsbad	A, C
N/A	3087 State St., Carlsbad	A, C

Source: ASM Affiliates, 2013

*NRHP Eligibility Criteria Key: A) Associated with events that have made a significant contribution to the broad patterns of our history; B) Associated with the lives of persons significant in our past; C) Embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; D) Have yielded or may be likely to yield information important in prehistory or history.

3.15.2.2 Section 6(f)

There were two separate land acquisitions within the Buena Vista Ecological Reserve that utilized LWCF assistance and thus qualify as Section 6(f) resources. The parcels within a half mile of the Proposed Action that are protected by Section 6(f) are listed in Table 3.15-3 and shown on Figure 3.15-2.

Table 3.15-3
Section 6(f) Resources

APN	Acreage	Description	Owner
155-130-24	17.02	LWCF Acquisition	CDFW
155-130-29	2.53	LWCF Acquisition	CDFW
155-140-33	25.21	LWCF Acquisition	CDFW
155-140-34	26.13	LWCF Acquisition	CDFW
Total	70.89		

Source: SanGIS, 2013.

3.15.3 Environmental Consequences

Proposed Action

Park and Recreation Areas

Impacts to Section 4(f)-protected parkland may include direct impacts such as physical encroachment via incorporation of parkland into the proposed transportation facility, as well as indirect impacts such as potential disruption of park access, a perceptible increase in noise, or visual changes that would diminish the use and enjoyment of the parks. A total of 45.7 acres of parkland within one-half mile of the Proposed Action would qualify for protection as parkland under Section 4(f). As shown on Figure 3.15-1, these parks and recreation areas are outside the Proposed Action's

SOURCE: Esri, 2016; SanGIS, 2016; T.Y. Lin, 2013

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Section 6(f) Resources

FIGURE
3.15-2

permanent and temporary impact area and will not be directly impacted. Section 4(f) parklands will not be indirectly impacted through disruption of park access, increase in noise/vibration or visual changes as supported by discussions in Section 3.16.11, 3.10 and 3.1 of this EA, respectively.

Wildlife and Waterfowl Refuges

A total of 120.90 acres of the Buena Vista Lagoon Ecological Reserve is within one-half mile of the project APE and would therefore qualify for protection under Section 4(f). However, because the Proposed Action's permanent and temporary impact area does not encroach on this land, there would be no direct impacts. Construction of the new double track bridge over Buena Vista Lagoon would be limited to within the NCTD ROW. However, there may be temporary indirect impacts associated with noise.

Historic and Cultural Resources

As discussed in the Cultural and Historical Resources Existing Conditions and Evaluation Report (ASM Affiliates, 2013), there are seven historic resource sites within the indirect APE that are either listed or eligible for listing in the NRHP. These resources could be subject to indirect effects from the Proposed Action. Although no significant visual, auditory, or atmospheric effects were identified as a result of the evaluation of indirect effects on the seven historic resource sites recommended as eligible within the indirect APE, the Proposed Action has the potential to result in a temporary vibration impact to the Carlsbad Santa Fe Depot during construction (see Section 3.16.5 and 3.16.10 of this EA). The Carlsbad Santa Fe Depot is within close proximity to the Proposed Action. Because of the nature of the materials of this historic resource, including its character-defining features, it is possible that vibrations generated during construction of the Proposed Action would have the potential to damage some of the historic fabric that qualifies it for 4(f) protection. Consequently, the Proposed Action has the potential to result in an indirect impact to the Carlsbad Santa Fe Depot during construction. This potential construction-related impact is addressed in Section 3.16.15 of this EA.

It should be noted that the potential vibration impact would result from construction of the Proposed Action, not from operational levels of the Proposed Action. The vibration levels at the Carlsbad Santa Fe Depot site would result in no change with operation of the Proposed Action.

Section 6(f) Resources

The Buena Vista Lagoon Ecological Reserve qualifies as a Section 6(f) resource. However, all Proposed Action impacts will be within the rail ROW and will not convert any portion of the property that has received LWCF funding.

No Action Alternative

Under the No Action Alternative, no development would occur and there would not be any change to existing conditions. Therefore, no impacts to any Section 4(f)-protected resources nor Section 6(f)-protected resources are identified for the No Action Alternative.

3.15.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Proposed Action may result in a temporary vibration impact to the Carlsbad Santa Fe Depot during construction of the Proposed Action. However, as discussed in Section 3.16.5 and 3.16.15, these impacts are temporary. A Vibration Monitoring Plan would be implemented in accordance with Mitigation Measure CHR-1, which would monitor construction-generated vibration.

Implementation of the Proposed Action may cause noise impacts to wildlife within the Buena Vista Lagoon Ecological Reserve. However, as discussed in Section 3.3, consultation between the FRA and the USFWS under Section 7 of the ESA would determine avoidance and minimization measures to minimize adverse effects to listed species within the Buena Vista Lagoon Ecological Reserve.

Consultation Requirements

Pursuant to 23 CFR Section 774.5(1) for historic properties, consultation and concurrence on a 'no adverse effect' or 'no historic properties' affected must be received from SHPO. Consultation requirements, including public review and comment on the Proposed Action effects on historic properties and wildlife refuges, will occur concurrently with public review of this EA.

There is no conversion of Section 6(f) resources to non-recreational uses, thus conversion and project agreement amendment requests need not be submitted to the National Park Service (per 36 CFR Section 59.3).

3.15.5 Impacts After Mitigation Measures

As discussed in Section 3.16.5 and 3.16.15 of this EA, implementation of Mitigation Measure CHR-1 would reduce any adverse indirect vibration impacts to the Carlsbad Santa Fe Depot resulting from construction activities. As discussed in Section 3.3, consultation under Section 7 of the ESA would ensure adverse impacts to wildlife or waterfowl refuges (Buena Vista Lagoon Ecological Reserve) are avoided and minimized.

3.16 Construction Impacts

This section of the EA discusses the potential environmental impacts to the issue areas described below associated with construction of the Proposed Action. The information contained in this section is summarized from the various technical reports prepared for each respective issue area, as cited herein, or was prepared by BRG Consulting, Inc.

3.16.1 Aesthetics and Scenic Resources

3.16.1.1 Environmental Consequences

Proposed Action

With implementation of the Proposed Action, the Lagoon and Carlsbad Village Landscape Units would not substantially differentiate from their existing visual quality and visual response. The Lagoon Landscape Unit would remain with natural and man-made features with landforms, vegetation, access and human structures. The Carlsbad Village Landscape Unit would maintain office, commercial, and residential development surrounding the railroad tracks. The Proposed Action would slightly expand the railroad infrastructure and alter the existing landform due to the widening of the bridge within the lagoon and grade crossing modifications throughout the developed segment; but overall, the impact would be minimal as disturbed areas are revegetated per the mitigation measures required in the biological resources section of this EA. It is anticipated construction would occur over an 18 to 30 month time frame and would include construction of additional embankment in the easterly half of the Buena Vista Lagoon, removal and construction of the railroad bridge, removal and construction of the existing Carlsbad Village Station Platform, and construction of an additional track, in addition to other relevant tasks. Truck trips to and from the project and construction equipment, stockpiles, and staging areas may slightly adversely affect the visual quality of the lagoon prior to revegetation; however, these features are required only during construction.

The temporary visual impacts are expected to be minimal due the distance of the site from the available public viewpoint. During construction, the existing setting of the lagoon and the Carlsbad Village Station would be temporarily disturbed within the railroad ROW. However, construction would take place within the railroad ROW and would be distant from all public viewsheds discussed; therefore, visual impacts related to construction are considered to be negligible.

No Action Alternative

Under the No Action Alternative, there would be no construction or construction-related visual impacts and the existing environment would remain as described in the Affected Environment Section 3.1.2. There would be no construction-related adverse impacts to visual impacts.

3.16.1.2 Avoidance, Minimization, and/or Mitigation Measures

It has been determined that visual impacts related to construction of the Proposed Action would be temporary with implementation of the biological resources avoidance and minimization measures BR1 through BR7 listed in Section 3.3.4, Avoidance, Minimization and/or Mitigation Measures of this EA; therefore, the visual impacts related to the construction are considered to negligible and no further mitigation would be required.

3.16.2 Air Quality and Greenhouse Gas Emissions

3.16.2.1 Environmental Consequences

Proposed Action

Construction activities associated with the Proposed Action would be anticipated to be completed within two and a half years. The construction activities and equipment/vehicles use data for the Proposed Action were provided by Pan Environmental (2013). Table 3.16-1 presents construction activities associated with the Proposed Action. On-road vehicles to be used for construction workers and material transportation during construction of the Proposed Action were based on model default values.

Table 3.16-1
Construction Activities

Construction Activity	Construction Days
Clearing	20
Utility Relocation	20
Station Improvements	90
Earthwork	45
Retaining Walls	45
Shoring	30
Track Installation	45
Signals	25
Demolish Existing Bridge	10
Construct BV Lagoon Bridge	300
Install Track Over Bridge	6
Signal Work at MT-1	25
Final Cut-Over and Removal of Turnouts	15

Source: Pan Environmental, 2013.

Air pollutant and GHG emissions resulting from construction activities associated with the Proposed Action were estimated using the California Emissions Estimator Model (CalEEMod) developed by the California Air Pollution Control Officers Association. This model estimates both maximum daily and annual average emissions for criteria air pollutants and GHG emissions. CalEEMod estimates construction emissions from a variety of source types, including off-road equipment and vehicle usage, on-road vehicle travel, and fugitive dust emissions, which are the primary emissions sources associated with construction of the Proposed Action.

Air Quality

Table 3.16-2 presents estimated maximum daily air pollutant emissions in pounds per day (lbs/day) associated with construction of the Proposed Action. Estimated annual air pollutant emissions during construction phases are shown in Table 3.16-3. The model output files are included in Appendix A of the Air Quality and Greenhouse Gas Impact Analysis Technical Report (Appendix B of this EA).

Table 3.16-2
Estimated Maximum Daily Construction Air Pollutant Emissions

Year	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2016	17.97	194.50	113.62	0.18	25.17	15.91
2017	23.12	243.87	136.21	0.24	13.37	11.01
2018	10.03	103.70	61.01	0.11	5.12	4.78
Emission Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Pan Environmental, 2013.

Table 3.16-3
Estimated Annual Construction Air Pollutant Emissions

Year	Estimated Maximum Annual Air Pollutant Emissions (tons/year)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2016	0.74	7.77	4.68	<0.01	0.81	0.56
2017	1.56	15.83	9.02	0.02	0.83	0.76
2018	0.53	5.40	3.20	<0.01	0.27	0.25
Emission Threshold	**--**	**40**	**100**	**40**	**15**	**--**
Exceeds Threshold?	**--**	**No**	**No**	**No**	**No**	**--**

Source: Pan Environmental, 2013.

As shown in Tables 3.16-2 and 3.16-3, the air pollutant emissions were estimated to be substantially below the corresponding emission thresholds. As such, the Proposed Action would not have an adverse construction-related impact on air quality.

Greenhouse Gas Emissions

Table 3.16-4 presents estimated annual GHG emissions in metric tons per year (metric tons/year) associated with construction of the Proposed Action. The model output files are included in Appendix A of the Air Quality and Greenhouse Gas Analysis Technical Report (Appendix B of this EA). There is no Federal standard for GHG emissions.

Table 3.16-4
Estimated Annual Construction GHG Emissions

Year	Estimated Annual GHG Emissions (metric tons/year)			
	CO_2	CH_4	N_2O	Total CO_2e
2016	657.94	0.19	0.00	661.83
2017	1,433.67	0.41	0.00	1,442.28
2018	532.05	0.15	0.00	535.25

Source: Pan Environmental, 2013.

No Action Alternative

Under the No Action Alternative, no construction would occur and existing air quality and GHG emissions would remain, as they exist today. Therefore, there would be no adverse construction-related impacts to air quality and GHG emissions under the No Action Alternative.

3.16.2.2 Avoidance, Minimization, and/or Mitigation Measures

As previously stated in this EA, the Proposed Action is part of the LOSSAN Program. Although no adverse construction-related air quality or GHG emissions impacts have been identified, the LOSSAN Program recommends several BMPs to ensure that air quality and GHG impacts are minimized during project-level construction phases to the maximum extent practicable. The Contractor would implement the following BMPs during the construction phases of the Proposed Action:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require that all trucks maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.
- Use alternative fuels for construction equipment when feasible.
- Minimize equipment idling time.
- Maintain properly tuned equipment.

Implementation of the above BMPs as recommended in the LOSSAN PEIR/PEIS would result in reductions of air pollutant and GHG emissions. However, with or without implementation of the subject BMPs, the Proposed Action would not have adverse impacts on air quality or GHG emissions during construction phases.

Tables 3.16-5 through 3.16-7 on the following page present estimated emissions after implementation of the above BMPs.

Table 3.16-5
Estimated Maximum Daily Construction Air Pollutant Emissions (After BMPs)

Year	Estimated Maximum Daily Air Pollutant Emissions (lbs/day)					
	VOC (Δ)	NO_X (Δ)	CO (Δ)	SO_2 (Δ)	PM_{10} (Δ)	$PM_{2.5}$ (Δ)
2016	17.95 (0)	194.33 (-.17)	113.52 (-.10)	0.18 (0)	17.15 (-8.02)	10.94 (-4.97)
2017	23.10 (-.02)	243.65 (-.22)	136.08 (-.13)	0.24 (0)	13.34 (-.03)	11.07 (+.06)
2018	10.02 (-.01)	103.61 (-.09)	60.96 (-.05)	0.11 (0)	5.11 (-.01)	4.77 (-.01)
Emission Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: (Δ) = Delta of impact difference as a result of mitigation measure implementation.
Source: Pan Environmental, 2013.

Table 3.16-6
Estimated Annual Construction Air Pollutant Emissions (After BMPs)

Year	Estimated Maximum Annual Air Pollutant Emissions (tons/year)					
	VOC (Δ)	NO_X (Δ)	CO (Δ)	SO_2 (Δ)	PM_{10} (Δ)	$PM_{2.5}$ (Δ)
2016	0.73 (-.01)	7.76 (-.01)	4.68 (0)	<0.01 (0)	0.65 (-.16)	0.46 (-.10)
2017	1.56 (0)	15.81 (-.02)	9.01 (-.01)	0.02 (0)	0.83 (0)	0.76 (0)
2018	0.53 (0)	5.39 (-.01)	3.19 (-.01)	<0.01 (0)	0.27 (0)	0.25 (0)
Emission Threshold	**--**	**40**	**100**	**40**	**15**	**--**
Exceeds Threshold?	**--**	**No**	**No**	**No**	**No**	**--**

Notes: (Δ) = Delta of impact difference as a result of mitigation measure implementation.
Source: Pan Environmental, 2013.

Table 3.16-7
Estimated Annual Construction GHG Emissions (After BMPs)

Year	Estimated Annual GHG Emissions (metric tons/year)			
	CO_2 (Δ)	CH_4 (Δ)	N_2O (Δ)	Total CO_2e (Δ)
2016	657.18 (-.76)	0.19 (0)	0.00 (0)	661.07 (-.76)
2017	1,431.97 (-1.7)	0.41 (0)	0.00 (0)	1,440.57 (-1.71)
2018	531.41 (-.64)	0.15 (0)	0.00 (0)	534.62 (-0.63)

Notes: (Δ) = Delta of impact difference as a result of mitigation measure implementation.
Source: Pan Environmental, 2013.

3.16.3 Biological Resources and Wetlands

3.16.3.1 Environmental Consequences

Proposed Action

All construction related impacts to biological resources and wetlands are discussed in Section 3.3.3, Environmental Consequences, of this EA.

No Action Alternative

Under the No Action Alternative, no construction would occur and existing resources would remain as they exist today. Therefore, there would be no adverse construction-related impacts to biological resources and wetlands under the No Action Alternative.

3.16.3.2 Avoidance, Minimization, and/or Mitigation Measures

All avoidance, minimization and/or mitigation measures designed to address construction related impacts to biological resources and wetlands are discussed in Section 3.3.4, Avoidance, Minimization and/or Mitigation Measures, of this EA.

3.16.4 Community Impacts and Environmental Justice

3.16.4.1 Environmental Consequences

Proposed Action

Construction of the Proposed Action would occur entirely within the NCTD ROW, and would not isolate any portion of a neighborhood or ethnic group, nor would it separate residences from community facilities near the Proposed Action area. As further discussed in Section 3.4, Community Impacts and Environmental Justice of this EA, there are no minority populations within the Proposed Action affected area and therefore a minority population would not be affected by construction of the Proposed Action. Although Census Tracts 179 and 180 are considered low-income populations, construction associated with the Proposed Action would not result in any construction-related resource impacts that would affect the public or human populations, and thus would not result in an environmental justice impact. During construction the Proposed Action would also have positive economic impacts and will improve the economic stability of the region by providing reliable commuter alternatives to the passenger car, reducing highway congestion, adding railroad–related employment opportunities and income, and provide additional revenues for the area. Therefore, construction associated with the Proposed Action would not result in any adverse community impacts or disproportionate impacts on minority or low-income populations located within the project area, and could potentially have beneficial economic impacts.

No Action Alternative

Under the No Action Alternative, no construction would occur and existing communities would remain as they exist today. Therefore, there would be no adverse construction-related impacts to communities under the No Action Alternative.

3.16.4.2 Avoidance, Minimization, and/or Mitigation Measures

There would be no construction-related community impacts, economic impacts, or disproportionate impacts on minority or low-income populations as a result of implementation of the Proposed Action. Therefore, no avoidance, minimization and/or mitigation measures are required.

3.16.5 Cultural and Historical Resources

3.16.5.1 Environmental Consequences

Proposed Action

The Carlsbad Santa Fe Depot is located along the property line adjacent to the Proposed Action, where heavy construction would be taking place. As further discussed in Section 3.16.10 below, because of the nature of the materials of this historic resource, including its character-defining features, it is possible that vibrations generated during construction would have the potential to damage elements that comprise the historic fabric of the Santa Fe Depot. Consequently, construction of the Proposed Action has the potential to result in adverse indirect impacts under 36 CFR 800. However, implementation of Mitigation Measure CHR-1 would reduce any adverse indirect construction-related impacts to the Carlsbad Santa Fe Depot to a negligible level.

No Action Alternative

Under the No Action Alternative, no construction would occur and cultural resources and historic properties would remain unaltered, as they exist today. Therefore, there would be no construction related adverse impacts to cultural resources or historic properties.

3.16.5.2 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action has the potential to result in adverse indirect impacts on the Carlsbad Santa Fe Depot because of the resource's close proximity to the Proposed Action and the nature of the historic fabric of this building. However, implementation of Mitigation Measure CHR-1 would reduce any adverse indirect impacts to the Carlsbad Santa Fe Depot resulting from construction activities.

CHR-1 Vibration measurements at the Carlsbad Santa Fe Historic Depot would be conducted during all construction activities at this location. The Contractor would be required to submit a Vibration Monitoring Plan prepared, stamped, and administered by an acoustical engineer. The Vibration Monitoring Plan would include the vibration instrumentation, location of vibration monitors, data acquisition, and exceedance notification and reporting procedures, as identified in Appendix C of the Noise and Vibration Impact Assessment prepared by ATS Consulting, Inc. (2014).

3.16.6 Geology and Soils

3.16.6.1 Environmental Consequences

Proposed Action

As discussed in Section 3.6, Geology and Soils of this EA, groundwater was encountered in all three borings conducted at Buena Vista Lagoon (Lagoon Segment) and both borings conducted at Carlsbad Village Station (Village Segment). In addition, the near surface marine and estuary deposits of the Lagoon Segment were observed to be loose to medium dense and potentially liquefiable during the Serviceability, Ultimate, and Survivability seismic events. Since the Proposed Action is located in seismically active southern California, it would be subject to shaking from both local and distant earthquakes and seismically induced settlement could pose a potential adverse geologic hazard in the Lagoon

Segment. The possibility of large seismic events on the nearby Newport Inglewood – Rose Canyon fault zone would have the potential to result in adverse impacts to both the Lagoon and Village Segments. Furthermore, the on-site soils sampled at the Lagoon Segment are classified as corrosive.

The geologic hazards identified above and further discussed in Section 3.6, Geology and Soils, of this EA could potentially result in adverse impacts during construction of the Proposed Action. However, the Proposed Action would be required to incorporate the seismic design criteria provided in the AREMA Manual pursuant to 49 CFR 237 and the NEHRP Recommended Seismic Provisions Manual pursuant to the provisions of the EHRA. In addition, the Proposed Action would implement Mitigation Measure GS-1 through GS-3 and Avoidance/Minimization Measure GS-4. As such, potential impacts associated with groundwater, strong seismic shaking, liquefaction, seismically induced settlement, and corrosive soils would be reduced to a negligible level, and the Proposed Action would not result in any adverse construction-related geology and soils impacts.

No Action Alternative

If the Proposed Action were not implemented, existing geology and soils would remain, as they exist today and potential impacts would not occur. As such, implementation of the No Action Alternative would have no impact on geology and soils.

3.16.6.2 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Proposed Action has the potential to result in adverse impacts to geology and soils in the Lagoon Segment. As such, SANDAG would implement the following mitigation measures to reduce adverse impacts to geology and soils to a negligible level.

GS-1 Following bridge type selection, a supplemental geotechnical field investigation would occur once the final foundation type has been determined. The supplemental investigation would include one geotechnical boring near the northern abutment that would be converted over to a monitoring well at the completion of the boring to record groundwater pressures. A set of fully grouted vibrating wire piezometers would be installed at a location that could be protected through design and construction. Properly located, the piezometers would be used by SANDAG and the Contractor to determine the groundwater conditions prior and continuously throughout construction to determine necessary measures in the Cast-In-Drilled-Hole (CIDH) pile installation plan and to resolve potential differing site condition claims.

GS-2 A Cone Penetration Test (CPT) sounding near the northern abutment would be performed, as needed, for the Designer to evaluate the in-situ density of the soils within the pressurized aquifer and to provide continuous information throughout the profile to further evaluate the liquefaction potential of material that were identified as potentially liquefiable.

GS-3 Soil corrosivity issues will be addressed in conformance with AREMA during subsequent design efforts by the Designer. Possible mitigation measures would include increased cover for reinforcing steel and corrosion resistant cement (for concrete piles), and sacrificial steel would be provided for steel surfaces in contact with site soils.

In order to avoid and/or minimize any impacts to geology and soils, pursuant to the EHRA and the USGS LHP in fulfillment of the requirements of Public Law 106-113, the following avoidance and minimization measure would be

implemented to protect geology and soils both during design and during construction of the Proposed Action, and would reduce any potential impacts to a negligible level.

GS-4 All future grading and construction of the project site performed by the Contractor would comply with the geotechnical recommendations contained in the Preliminary Foundation Reports prepared for the Carlsbad Village Station Pedestrian Undercrossing and the Buena Vista Lagoon Bridge (Earth Mechanics, Inc., 2014a and 2014b). These reports identify specific geotechnical recommendations that would be implemented during the design and construction of the project.

3.16.7 Hazardous Materials and Hazardous Waste

3.16.7.1 Environmental Consequences

Proposed Action

Due to the intrusive nature of the construction involved for the Proposed Action, it is recommended that preliminary media sampling (surface and near surface soils in particular) be conducted prior to commencing any intrusive work at the site to confirm whether contaminants are or are not present at the subject property. As discussed in Section 3.7.2 of this EA, the subject property's historic use as an active railroad since the 1880's may provide for the presence of creosote, heavy metals (such as arsenic), petroleum based compounds, and other non-metal herbicide compounds. If these contaminants are present, they may pose a risk to human health (site workers and the public within the vicinity of the subject property) from the inhalation of dust or direct contact with skin or eyes. Furthermore, the contaminants may pose a risk to natural habitat or sensitive species in the open area around the lagoon, and may threaten the water quality of the lagoon. As such, potential impacts to human and/or environmental health resulting from exposure to contaminants potentially present on the Proposed Action site would be considered adverse. However, preliminary media sampling would identify the location, if any, of potential contaminants on the Proposed Action site and measures to reduce their exposure would be developed at that time.

No Action Alternative

The No Action Alternative is equivalent to the existing conditions; therefore, no impacts related to hazardous materials-hazardous waste are associated with maintaining the existing conditions.

3.16.7.2 Avoidance, Minimization, and/or Mitigation Measures

The Proposed Action could have an adverse impact related to hazardous materials/hazardous waste when intrusive work is conducted (for example bridge pilings, pedestrian underpass). In order to assure that contaminants are not present and minimize potential adverse impacts, the following mitigation measure will be implemented:

HZ-1 The Contractor would conduct preliminary media sampling (surface and near surface soils in particular) prior to any intrusive work at the site to confirm whether contaminants are or are not present at the subject property.

3.16.8 Hydrology and Floodplains

3.16.8.1 Environmental Consequences

Proposed Action

Typical construction related impacts to hydrology and floodplains may include flooding, soil erosion, stormwater runoff, and sedimentation. However, implementation of a SWPPP including the proper use of construction BMPs would minimize construction related hydrology and floodplain impacts. Additionally, the Proposed Action includes the construction of a new double track bridge over Buena Vista Lagoon, which is designated as a FEMA Zone A floodplain. A 25-year storm event was modeled to simulate flooding conditions during construction of the proposed bridge. Maximum water elevations at the bridge during construction were determined to be 8.9 feet. These results indicate that the proposed bridge would not cause adverse flooding impacts during construction. Therefore, construction of the Proposed Action would not result in any adverse hydrology and floodplains impacts.

No Action Alternative

Under the No Action Alternative, no construction would occur. The project area would remain as it exists today; therefore, there would be no impacts to hydrology and floodplains.

3.16.8.2 Avoidance, Minimization, and/or Mitigation Measures

Construction of the Proposed Action would not adversely impact the drainage patterns within the project area's hydrologic setting. To ensure no construction-related impacts to hydrology or floodplains occur, a hydromodification management plan and a SWPPP detailing construction BMPs would be prepared during final design.

3.16.9 Land Use, Zoning, and Property Acquisitions

3.16.9.1 Environmental Consequences

Proposed Action

Construction of the Proposed Action would occur entirely within the NCTD ROW, and no permanent or temporary property acquisition would be required. Temporary construction access would be provided through existing NCTD maintenance access roads. As further discussed in Section 3.9, there would be no construction-related impacts to any of the resource areas with implementation of the Proposed Action. As such, the Proposed Action would not result in any conflicts with any of the corresponding elements of the General Plans (i.e. Noise Element, Public Safety Element) for Carlsbad and Oceanside, and there would be no construction-related impacts to existing land uses, zoning, or properties as a result of the implementation of the Proposed Action.

No Action Alternative

Under the No Action Alternative, no construction would occur. The project area would remain as it exists today; therefore, there would be no impacts to land use, zoning, or property acquisitions.

3.16.9.2 Avoidance, Minimization, and/or Mitigation Measures

There would be no construction related impacts to existing land uses, zoning, or properties as a result of the implementation of the Proposed Action. Therefore, no avoidance, minimization and/or mitigation measures are required.

3.16.10 Noise and Vibration

Construction Noise Criteria

According to the FTA, project construction noise criteria should take the following into account: the existing noise environment, the absolute noise levels during construction activities, the duration of construction, and adjacent land uses (FTA, 2006). Sound level guidelines suggested by the FTA for the evaluation of construction noise impacts are summarized in Table 3.16-8. In urban areas with high ambient noise levels (Ldn greater than 65 dBA), the sound level from construction should not exceed the ambient sound level by more than 10 dBA.

Table 3.16-8
FTA Guidelines for Assessing Construction Noise Impact

Land Use	8-hour L_{eq} (dBA)	
	Day	Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: FTA, 2006.

City of Carlsbad Municipal Code

Chapter 8.48, Noise, of the City of Carlsbad Municipal Code deems it unlawful to operate equipment or perform any construction or grading or excavation of land during the following hours:

- After 6:00 p.m. on any day and before 7:00 a.m., Monday through Friday and before 8:00 a.m. on Saturday;
- All day on Sunday, New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.

Any construction activities during these hours would require a permit granting an exception by the city manager. There are no noise level limits for construction.

City of Oceanside Municipal Code

Chapter 38, Noise Control, of the City of Oceanside Municipal Code does not have allowable hours or noise level limits for construction. It states that the city manager, or the manager's designee, on a case-by-case basis, may authorize construction, maintenance or other public improvement activities by a government agency or a public utility, that exceed the noise, duration or hour of work limits established by Chapter 38, upon a determination that the authorization furthers the public interest.

Construction Vibration Criteria

The information provided in this section is a summary of the information provided in the Noise and Vibration Impact Analysis, (ATS Consulting, 2014) (Appendix K of this EA). Vibration is generally assessed in terms of peak particle velocity (PPV) for risk of building damage. PPV is the appropriate metric for evaluating the potential of building damage and is often used when monitoring blasting and construction vibration because it relates to the stresses that are experienced by the buildings. Vibration damage risk thresholds referenced in the FTA and FRA Guidance Manuals are used to assess potential for damage from construction. The damage risk criterion of 0.12 inch/second PPV is used for the Carlsbad Santa Fe Historic Train Depot. Construction vibration, unlike vibration from operations, has the potential to cause damage to structures at very close distances, from activities such as impact hammering and pile-driving. Generally, because of the short duration of construction vibration activities, annoyance is usually not an issue. The thresholds for damage for even the most sensitive buildings are 1 to 2 orders of magnitude higher than the criteria for annoyance from vibration.

3.16.10.1 Environmental Consequences

Proposed Action

Construction Noise Impacts

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment. For most construction equipment, the engine, which is usually diesel, is the dominant noise source. This is particularly true of engines without sufficient muffling.

Projecting construction noise requires a construction scenario of the equipment likely to be used and the average utilization factors or duty cycles (i.e., the percentage of time during operating hours that the equipment operates under full power during each phase). Table 3.16-9 shows categories of equipment that are likely to be used and the typical noise generated by this equipment when it is operating at full load. The typical noise levels, along with estimates of what equipment would be used during the loudest phases of the project, and the usage factors (how long the equipment is used) for each category of equipment are used to estimate construction noise levels.

Construction noise estimates are always approximate because of the lack of specific information available at the time of this EA. Project designers usually try to minimize constraints on how the construction would be performed and what equipment would be used so that contractors can perform construction in the most cost effective manner. Minimization measures have been included that incorporates effective, best-practice noise control measures during construction.

Based on a typical construction scenario for ballast-and-tie track construction, an 8-hour L_{eq} of 88 dBA should be expected at a distance of 50 feet from the geometric center of the work site. With at-grade track construction, the duration of the activities at a specific location along the alignment would be relatively limited, usually a matter of several weeks. As a result, even when there may be noise impacts, the limited duration of the construction can mean that some forms of mitigation are not cost effective.

Table 3.16-9
Construction Equipment Noise Levels

Equipment	Sound Level at 50 Feet Under Full Load
Earthmover (bulldozer, front-end loader, etc.)	82 dBA
Mobile Crane	81 dBA
Dump Truck	76 dBA
Pneumatic Tools	85 dBA
Generator	78 dBA
Compressor	81 dBA

Source: ATS Consulting, 2014.

Temporary noise during construction of the new tracks and the stations has the potential of being intrusive to residents near the construction sites. Most of the construction would consist of site preparation and laying new track, and would only occur during daytime hours and construction activities would be carried out in compliance with all applicable local noise regulations. In addition, specific residential property line noise limits would be developed during final design and included in the construction specifications for the Proposed Action, and noise monitoring would be performed during construction to verify compliance with the limits. Furthermore, the noise control measures identified below would be implemented as needed to meet the noise limit standards.

Construction Vibration Impacts

A construction vibration analysis for the Carlsbad Santa Fe Depot is provided in Appendix C of the Noise and Vibration Impact Assessment. The building is located directly along the property line adjacent to the Proposed Action, where heavy construction would be taking place. Because of the nature of the materials of this historic resource, including its character-defining features, it is possible that vibrations generated during construction would have the potential to damage elements that comprise the historic fabric of the Santa Fe Depot.

Construction activities in the vicinity of the Historic Train Depot would include soil excavation for trackbed construction, compaction of subgrade and ballast, and track laying activity. The expected equipment to be used during these construction phases are loaders/backhoes, dozers, track tampers, track-laying machines, track stabilizers, and forklifts.

Table 3.16-10 is a summary of the predicted construction vibration levels during the phases of construction that would generate the maximum vibration levels: soil excavation for trackbed construction, and compaction of subgrade and ballast. Track laying activities is not expected to result in vibration levels that would approach the damage risk criteria for the Carlsbad Santa Fe Historic Depot (0.12 inch/second PPV).

During compaction of the subgrade and ballast there is the potential to exceed 0.12 inch/second PPV at the Historic Train Depot when the track tamper is used within 20 feet of the building. Vibration monitoring would be required to ensure the threshold criteria is not exceeded.

In summary, construction of the Proposed Action has the potential to result in adverse indirect impacts under 36 CFR 800. However, as identified in Section 3.16.5 above, implementation of Mitigation Measure CHR-1 would reduce any adverse indirect construction-related vibration impacts to the Carlsbad Santa Fe Depot to a negligible level.

Table 3.16-10
Major Vibration Generating Construction Activities

Construction Phase	Equipment	PPV Reference Level at 100 feet (in/sec)	Receiver	Distance (feet)	Predicted Vibration Level – PPV (in/sec)	Damage Risk Criteria – PPV (in/sec)	Potential Exceedance of Damage Risk Criteria
Soil Excavation for Trackbed Construction	Loader/Backhoe Dozer	0.011	Front of Depot Building	15	0.089	0.12	No
			Rear of Depot Building	43	0.028	0.12	No
Compaction of Subgrade and Ballast	Track Tamper	0.022	Front of Depot Building	15	0.177	0.12	Yes
			Rear of Depot Building	43	0.056	0.12	No

Source: ATS Consulting, 2014.

No Action Alternative

Under the No Action Alternative, no construction would occur and there would be no noise or vibration impacts to sensitive receptors that would result from implementation of the Proposed Action.

3.16.10.2 Avoidance, Minimization, and/or Mitigation Measures

Temporary noise during construction of the new tracks and the station has the potential of being intrusive to residents and other sensitive receptors near the construction sites. However, construction activities would be carried out in compliance with all applicable local noise level standards. In addition, specific residential property line noise limits would be developed during final design and included in the construction specifications for the Proposed Action, and noise monitoring would be performed during construction to verify compliance with the limits. Furthermore, the Contractor would implement the following noise control measures as needed to meet the noise limit standards:

- Avoiding nighttime construction in residential neighborhoods.
- Using specially quieted equipment with enclosed engines and/or high-performance mufflers.
- Locating stationary construction equipment as far as possible from noise-sensitive sites.
- Constructing noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.
- Re-routing construction-related truck traffic along roadways that would cause the least disturbance to residents.
- Avoiding impact pile driving near noise-sensitive areas, where possible. Drilled piles or the use of a sonic or vibratory pile driver are quieter alternatives where the geological conditions permit their use.

With incorporation of the noise control measures described above, impacts from construction-generated noise would be minimized. To provide added assurance, a complaint resolution procedure should also be put in place to rapidly address any noise issues that may develop during construction. Therefore, the Proposed Action has minimized adverse construction-generated noise impacts, and no mitigation measures are required.

Construction of the Proposed Action poses the potential for vibration-related impacts to occur to the Carlsbad Santa Fe Historic Depot structure. Implementation of Mitigation Measure CHR-1 (preparation of a Vibration Monitoring Plan), as identified in Section 3.16.5 above, would monitor any potential adverse indirect construction-related vibration

impacts to the Carlsbad Santa Fe Depot and would include notification and reporting procedures. In addition, any potential construction-related vibration impacts to any other sensitive receivers would be avoided by implementing numeric limits in the construction specifications (ATS Consulting, 2013).

3.16.11 Parks and Recreational Areas

3.16.11.1 Environmental Consequences

Proposed Action

While there would be no direct impacts to nearby parks by physical encroachment onto the property, the two nearest parks may be impacted by construction noise and vibration. These include Lions Club Park in Oceanside, and the Army and Navy Academy's athletic fields in Carlsbad. Located at the northern end of the project site, Lions Club Park is within 100 feet of the permanent and temporary impact areas, and directly across from Cassidy Street which is the entrance to the temporary access road that would provide ingress/egress for construction vehicles. The Army and Navy Academy's athletic fields are located immediately south of, and directly adjacent to, the ROW and the permanent impact area. Both parks are close enough to the project site to be potentially impacted by construction noise and vibration as a consequence of implementation of the Proposed Action. However, as further discussed above in Section 3.16.10, Noise and Vibration, construction activities for the Proposed Action would be in compliance with all applicable local noise regulations. In addition, noise and vibration numeric limits in construction specifications would be implemented, as necessary, which would minimize construction-generated noise and vibration impacts.

No Action Alternative

Under the No Action Alternative, no construction would occur and the existing conditions would remain, as they exist today. As such, there would be no temporary construction-related impacts to Lions Club Park or the Army and Navy Academy athletic fields. Therefore, no adverse impacts to parks or recreational areas would occur.

3.16.11.2 Avoidance, Minimization, and/or Mitigation Measures

Lions Club Park and the Army and Navy Academy's athletic fields could potentially experience temporary construction noise and vibration impacts. However, the Proposed Action would be in compliance with all applicable local noise regulations. Noise and vibration limits would be implemented, as necessary, which would minimize construction-generated noise and vibration impacts (see Section 3.16.10). In addition, recreational access will be maintained during construction. Therefore, no mitigation measures are required.

3.16.12 Public Health and Safety

3.16.12.1 Environmental Consequences

Proposed Action

Emergency Services

Work on new medians in Carlsbad Village Drive and Grand Avenue, and crossing improvements could result in localized congestion with the potential to reduce access by emergency vehicles. Such work would happen under the

protection of traffic control personnel, who would be instructed to ensure access by emergency vehicles. Also, traffic control personnel would ensure that protection of vehicles and pedestrians at the railroad crossings would be maintained during work on any safety feature such as crossing gates and signals. These measures would minimize the construction related impacts to emergency services from the Proposed Action.

Utilities

A number of utility lines (i.e. sewer, gas, storm drain, transmission) would need to be relocated to accommodate some of the components of the Proposed Action. Test holes will be dug as the design is finalized to determine exact locations of utilities. The information acquired would be used to determine exact relocation lengths and locations. It can be expected that all affected utility lines would be relocated within proposed impact area. Therefore, implementation of the Proposed Action would not result in any adverse impacts to utilities.

Schools and Hospitals

Existing schools and hospitals are located more than half a mile from the ROW and there will be no increase in demand for their services. Schools and hospitals will not be impacted by the Proposed Action.

Therefore, the Proposed Action has no or minimized impacts to public health and safety.

No Action Alternative

Under the No Action Alternative, no construction would occur and the existing conditions would remain, as they exist today. As such, there would be no temporary construction-related impacts, which may affect the public health or safety.

3.16.12.2 Avoidance, Minimization, and/or Mitigation Measures

There would be no or minimal construction related impacts to public health or safety as a result of the implementation of the Proposed Action. Therefore, no mitigation measures are required.

3.16.13 Relocation Impacts

3.16.13.1 Environmental Consequences

Proposed Action

There would be no persons, businesses, and/or employment that would need to be relocated as a result of implementation of the Proposed Action, as it would maintain the existing railroad alignment within the existing railroad ROW with no property acquisition required. Therefore, there would be no construction related impacts resulting in relocation.

No Action Alternative

Under the No Action Alternative, no construction would occur and the existing conditions would remain, as they exist today. As such, there would be no temporary construction-related relocation impacts; and therefore, no mitigation measures would be required.

3.16.13.2 Avoidance, Minimization, and/or Mitigation Measures

There would be no persons, businesses, and/or employment that would need to be relocated as a result of the implementation of the Proposed Action. Therefore, there would be no construction related impacts resulting in relocation, and no mitigation measures are required.

3.16.14 Water Quality and Water Resources

3.16.14.1 Environmental Consequences

Proposed Action

Construction activities may have the potential to generate runoff that would discharge pollutants into Buena Vista Lagoon and/or Agua Hedionda Lagoon, which are both listed as Section 303(d) impaired water bodies. Construction discharges could result in a water quality impact. However, with the implementation of a SWPPP and construction BMPs, impacts to water quality would be minimized.

No Action Alternative

Under the No Action Alternative, no construction would occur. The project area would remain as it exists today; therefore, there would be no impact to water quality.

3.16.14.2 Avoidance, Minimization, and/or Mitigation Measures

With the implementation of a SWPPP and construction BMPs, including Standard Site Design BMPs (e.g. minimize impervious surfaces, drain into vegetated ditches, prevent erosion control), Source Control BMPs (e.g. mark storm drain inlets, landscape with and preserve existing native vegetation), LID BMPs (e.g. preserve natural drainage features, use pervious surfaces), and Treatment Control BMPs (e.g. construction of bioretention swale), water quality impacts to downstream receiving waters as a result of the Proposed Action would be avoided or minimized. Therefore, no mitigation measures are required.

3.16.15 Section 4(f) and 6(f) Evaluation

3.16.15.1 Environmental Consequences

Proposed Action

Park and Recreation Areas. A total of approximately 46 acres of parkland within one-half mile of the Project Alternative would qualify for protection as parkland under Section 4(f), however, the parkland is located outside of the Proposed Action's permanent and temporary impact area.

Wildlife and Waterfowl Refuges. A total of approximately 121 acres of the Buena Vista Lagoon Ecological Reserve is within one-half mile of the Proposed Action and would therefore qualify for protection under Section 4(f). However, because the Proposed Action's permanent and temporary impact area does not encroach on this land, there would be no direct impacts. Construction of the new double track bridge over Buena Vista Lagoon would be limited to within the

NCTD ROW. However, there may be temporary indirect impacts associated with noise that may diminish the value of wildlife habitat.

Historic and Cultural Resources. As discussed in the Cultural and Historical Resources Existing Conditions and Evaluation Report (ASM Affiliates, 2013), there are seven historic resource sites within the indirect APE (includes additional areas that the Proposed Action could indirectly affect, that is a one parcel buffer surrounding the APE) that are either listed or eligible for listing in the NRHP. These resources could be subject to indirect effects from the Proposed Action. Although no significant visual, auditory, or atmospheric effects were identified as a result of the evaluation of indirect effects on the seven historic resource sites recommended as eligible within the indirect APE, the Proposed Action has the potential to result in a temporary vibration impact to the Carlsbad Santa Fe Depot during construction. The Carlsbad Santa Fe Depot is within close proximity to the Proposed Action. Because of the nature of the materials of this historic resource, including its character-defining features, it is possible that vibrations generated during construction of the Proposed Action would have the potential to damage some of the historic fabric that qualifies it for 4(f) protection. Consequently, the Proposed Action has the potential to result in an adverse indirect impact to the Carlsbad Santa Fe Depot. However, implementation of Mitigation Measure CHR-1 in Section 3.16.5 would reduce any adverse indirect construction-related impacts to the Carlsbad Santa Fe Depot to a negligible level.

No Action Alternative

Under the No Action Alternative, no construction would occur and the existing conditions would remain as they exist today. As such, there would be no temporary construction-related impacts to Section 4(f) properties. Therefore, no adverse impacts to Section 4(f) would occur.

3.16.15.2 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Proposed Action may result in a temporary vibration impact to the Carlsbad Santa Fe Depot during construction of the Proposed Action. However, as discussed in Section 3.16.5, these impacts are temporary. A Vibration Monitoring Plan would be implemented in accordance with Mitigation Measure CHR-1, which would minimize the potential for construction-generated vibration.

Implementation of the Proposed Action would temporarily generate noise that may interfere with the value of wildlife habitat. However, as discussed in Sections 3.3 and 3.15.4, consultation between the FRA and the USFWS under Section 7 of the ESA would determine avoidance and minimization measures to minimize adverse effects to listed species within the Buena Vista Lagoon Ecological Reserve.

3.16.16 Paleontological Resources

3.16.16.1 Environmental Consequences

Proposed Action

The Proposed Action is located within the north Coastal Plain Region of San Diego County. This geographic region includes the near-shore area, comprised of raised Pleistocene marine and non-marine terraces ranging from 3 to 12 miles (5 to 20 kilometers) in width. Miocene and Tertiary marine deposits underlie these terraces (ASM Affiliates, 2013).

The coastal terraces are dissected by westerly flowing streams, most of which are under tidal influences near the coast forming broad tidal flats and estuaries.

The Proposed Action site is underlain by shallow and thick sections of young to old alluvial paralic deposits and alluvial flood plain deposits. The marine and continental paralic deposits are associated with estuarine/lagoonal, alluvial, and littoral depositional environments. These deposits form a deep basin underneath the Buena Vista Lagoon. The old paralic deposits are mantled by the Santiago Formation, which consists of poorly indurated, grey to brownish grey, silty fine-grained sandstone. The Santiago Formation also consists of interbeds and lenses of siltstone and claystone (Earth Mechanics, Inc., 2014). Table 3.16-11 provides the paleontological resource sensitivity for each of these formations.

Table 3.16-11
Paleontological Resources

Geologic Formation/Unit	Paleontological Sensitivity
Middle Eocene Santiago Formation	High
Old Quaternary Paralic Deposits	Moderate
Recent Alluvial Floodplain Deposits	Low

Source: Earth Mechanics, Inc., 2014; Deméré & Walsh, 1994.

As identified in Table 3.16-11, alluvial floodplain deposits have a low potential for producing significant paleontological resources, while old paralic deposits have a moderate potential for producing significant paleontological resources. In addition, the Santiago Formation has a high potential for producing significant paleontological resources. However, the Santiago Formation mantles the old paralic deposits in the central portion of the Buena Vista Lagoon located outside the temporary and permanent impact area of the Proposed Action. Therefore, it is not anticipated that the Proposed Action would result in adverse impacts to potential paleontological resources located within the Santiago Formation.

Due to the moderate paleontological sensitivity of the old paralic deposits underlying the site, excavation associated with construction of the Proposed Action would have the potential to uncover significant paleontological resources. Although the Proposed Action would not involve substantial grading and earthwork, implementation of Mitigation Measure PR-1 would minimize any potential impacts to paleontological resources potentially located within old paralic deposits.

No Action Alternative

Under the No Action Alternative, existing geologic formations would remain as they exist today and any fossils preserved in these formations would not be impacted. As such, the No Action Alternative would have no impact on paleontological resources.

3.16.16.2 Avoidance, Minimization, and/or Mitigation Measures

In order to avoid and/or minimize any impacts to paleontological resources, SANDAG would implement the following Mitigation Measure during the construction of the Proposed Action.

PR-1 Prior to site grading, a qualified paleontologist would be retained by SANDAG to carry out an appropriate mitigation program. (A qualified paleontologist is defined as an individual with a minimum MS. or PhD. in

paleontology or geology who is familiar with paleontological procedures and techniques.) In addition, the following would be implemented:

- The qualified paleontologist would be present at the pre-construction meeting to consult with the grading and excavation contractors.
- A paleontological monitor would be on-site a minimum of half-time during the original cutting of previously undisturbed sediments to inspect cuts for contained fossils. In the event that fossils are discovered, it may be necessary to increase the per/day in field monitoring time. Conversely, if fossils are not being found then the monitoring should be reduced. (A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials. The paleontological monitor would work under the direction of a qualified paleontologist.)
- When fossils are discovered the paleontologist (or paleontological monitor) would recover them. In most cases, this fossil salvage can be completed in a short period of time. However, some fossil specimens (such as complete large mammal skeleton) may require an extended salvage period. In these instances, the paleontologist (or paleontological monitor) would be allowed to temporarily direct, divert, or halt grading to allow recovery of fossil remains in a timely manner subject to railroad safety requirements. Because of the potential for the recovery of small fossil remains, such as isolated mammal teeth, it may be necessary in certain instances, to set up a screen-washing operation on the site.
- Fossil remains collected during the monitoring and salvage portion of the mitigation program would be cleaned, repaired, sorted, and cataloged.
- Prepared fossils, along with copies of all pertinent field notes, photos, and maps, would either be deposited (as a donation) in a scientific institution with permanent paleontological collections such as the San Diego Natural History Museum or retained by the SANDAG and displayed for the public at an appropriate location such as the SANDAG offices.
- A final summary report would be completed and retained on file at SANDAG that outlines the results of the mitigation program. This report would include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.

3.17 Cumulative Impacts

This EA was prepared in compliance with NEPA, CEQ's NEPA implementing regulations, and FRA's Procedures for Considering Environmental Impacts (FRA Procedures). The following definition of cumulative impacts under NEPA is found in 40 CFR, Section 1508.7 of the CEQ Regulations:

> "Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.
>
> Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

3.17.1 Affected Environment

The preparation of this cumulative impact analysis included the consultation and consideration of City of Oceanside and Carlsbad and regional development projects from the Cities, SANDAG, and Caltrans highway projects. For local land development, infrastructure, and highway projects the approach to cumulative impacts analysis was determined by the proximity to the Carlsbad Village Double Track site. Current and reasonably foreseeable projects considered in the cumulative analysis for the Proposed Action are identified in Table 3.17-1, Cumulative Projects, and their locations are shown on Figure 3.17-1, Cumulative Projects. Information on these projects was obtained through review of available environmental documentation.

The area of cumulative effect varies depending on the resource issue analyzed. Most of these projects are physically too far away to contribute to cumulative impacts for most resource areas (except for Biology, Air Quality and Geology and Soils) because the impacts for most resources would be limited to a small geographical area in the immediate vicinity of the cumulative project. Cumulative projects considered for analysis of Biology, Air Quality and Geology and Soils include other rail projects in close proximity to the Proposed Action and projects proposed within the Buena Vista Lagoon. The Proposed Action lies within close proximity of six projects including the CP North Oceanside Double Track Project, Carlsbad Double Track Project, Poinsettia Station Improvements, Batiquitos Lagoon Double Track Project, replacement of the Buena Vista Lagoon I-5 bridge as part of the I-5 NCC Project as well as the proposed Buena Vista Lagoon Enhancement Project, which is an existing project under review and consideration by SANDAG as shown in Figure 3.17-2.

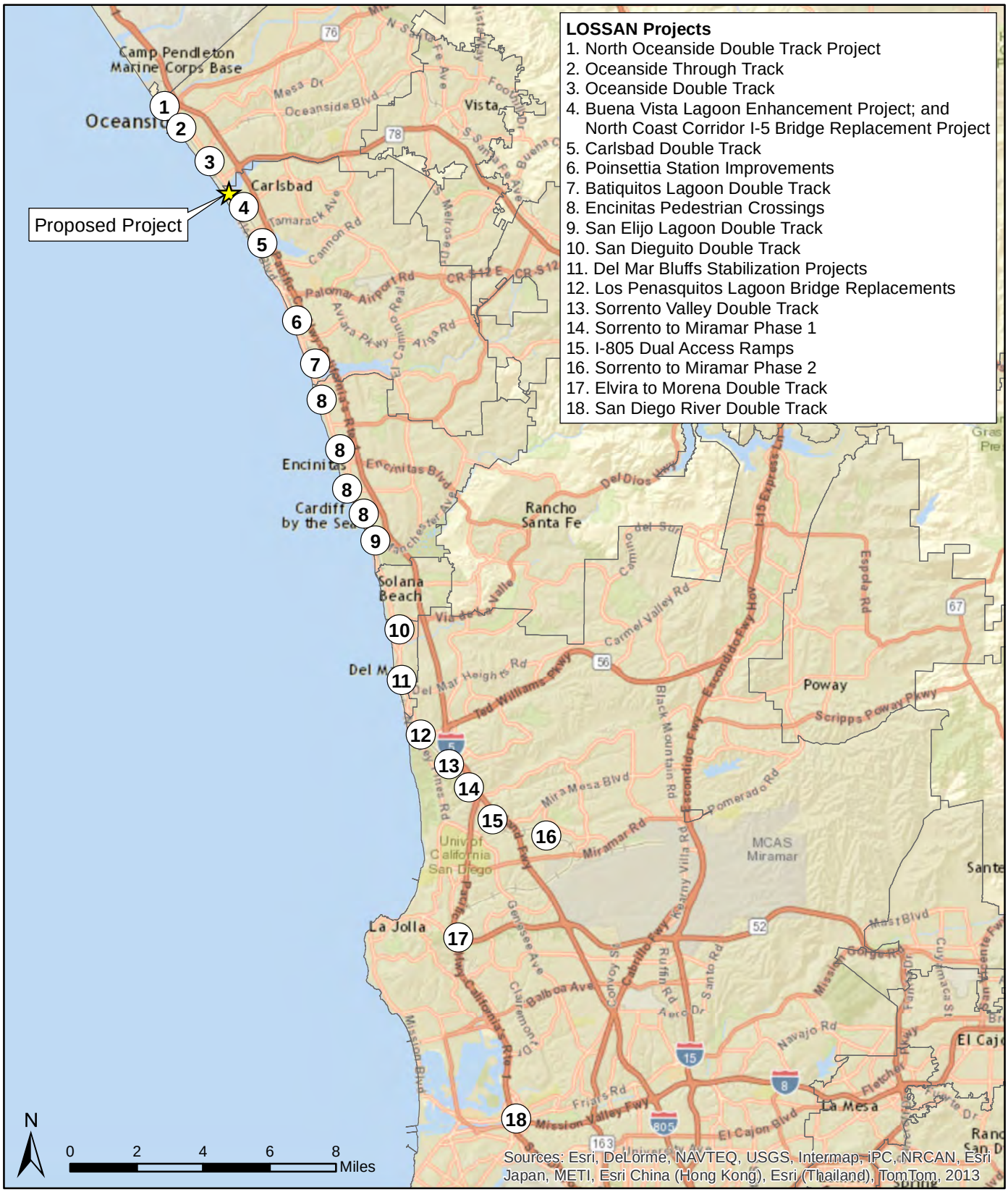
Table 3.17-1
Cumulative Projects

Project Name	Jurisdiction/Location	Proposed Development	Project Status
North Oceanside Double Track Project (CP Eastbrook to CP Shell)	North County Transit District/SANDAG – LOSSAN corridor railroad ROW in the City of Oceanside between Oceanside Harbor and Pier View Way.	Approximately one-mile of second track will be added that will join two existing double track segments together, replace the bridge over San Luis Rey River with a double track bridge.	Design
Carlsbad Double Track and Bridge Project	North County Transit District/SANDAG – LOSSAN corridor railroad	Approximately 1.9 mile of second track will be added between MP 229.5 and MP 231.4. The project included a new double	Construction completed in 2012.

Project Name	Jurisdiction/Location	Proposed Development	Project Status
	ROW in the City of Carlsbad between Carlsbad Village Drive and south of Cannon Road.	track bridge over Agua Hedionda Lagoon and a new grade crossing and expansion over Cannon Road.	
Poinsettia Station Improvements Project	Poinsettia Train Station in Carlsbad	The Poinsettia Station Improvements Project is located in the City of Carlsbad and includes the replacement of the existing at-grade pedestrian rail crossing with a new grade-separated pedestrian undercrossing. In addition, Poinsettia Station's signal system will be modified, and an inter-track fence will be installed.	Design
Batiquitos Lagoon Double Track Project	North County Transit District/SANDAG – LOSSAN corridor railroad ROW in the cities of Carlsbad and Encinitas.	Approximately 2.7 miles of second track will be added that will join two existing double track segments together, replace the bridge over Batiquitos Lagoon with a double track bridge.	Design
Buena Vista Lagoon Enhancement Project	SANDAG – City Carlsbad and City of Oceanside	SANDAG is currently in the process of developing an enhancement plan with a range of alternatives considering protection of endangered species; promotion of native costal plant and animal species requirements; improvement to water quality; and, long-term site maintenance and management. Several alternatives involve replacing the Highway 101 (Carlsbad Blvd) Bridge that traverses the Lagoon.	Draft Environmental Impact Report has been reviewed by public.
I-5 North Coast Corridor project I-5 Bridge Replacement	City of Carlsbad/Buena Vista Lagoon	Caltrans and SANDAG propose to lengthen the Buena Vista Lagoon bridge from 102 feet to 197 feet. However, final bridge design is not available, as it will depend on the alternative chosen for the Buena Vista Lagoon Enhancement Project.	Final EIR/S. Bridge design pending
Los Peñasquitos Lagoon Bridge Replacements	North County Transit District/SANDAG – LOSSAN corridor railroad ROW between approximately McGonigle Road and Carmel Mountain Road in San Diego.	Replaces four aging timber trestle railway bridges at MP 246.1, 246.9, 247.1, and 247.7 that were built in the early 1900s.	Under Construction
Sorrento Valley Double Track	North County Transit District/SANDAG – LOSSAN corridor railroad ROW between southern end of Los Peñasquitos Lagoon to the Sorrento Valley train station in San Diego	Approximately one-mile of second mainline track added to the existing railroad, extend the Sorrento Valley train station platforms, add additional station parking areas, and replace three existing bridges.	Open for Service
Sorrento to Miramar Phase 1	North County Transit District/SANDAG – LOSSAN corridor railroad ROW from MP 249.8 to MP 251.0 in San Diego	Double track from MP 249.8 to MP 251.0; replace Bridge 249.9 over Carroll Canyon Creek with a concrete double track bridge on the west of the existing Valley Boulevard; construct a 12-foot wide access road north of the existing track along the majority of the alignment;	Open for Service

Project Name	Jurisdiction/Location	Proposed Development	Project Status
		and relocate a Control Point (CP) from its existing location north of Bridge 249.9 to MP 251.	
Dual Access Ramps	Caltrans/I-805 (Carroll Canyon Road) In San Diego	Construction of the north facing dual access ramps from the Carroll Canyon Road extension to the median of I-805, as well as, the construction of northbound and southbound HOV lanes within the median from Mira Mesa Boulevard to the existing HOV lanes at I-5 including median bridge widening at the Sorrento Valley Boulevard undercrossing and the Mira Mesa Boulevard undercrossing	Under Construction
Los Angeles to San Diego (LOSSAN) Rail Improvements	From Los Angeles to San Diego	Rail Corridor Improvement - Program-level evaluation of double-tracking of railroad tracks and other improvements including bridge and track replacements, new platforms, pedestrian undercrossings, and other safety and operational enhancements.	ROD issued in 2009
Oceanside Through Track	Oceanside Transit Center	Rail Corridor Improvement - Add platform and third track to accommodate Coaster and/or Metrolink trains.	Construction to begin in 2016.
Sorrento to Miramar Phase II	City of San Diego from I-805 to Miramar Road.	Add two miles of second main track to the San Diego region's coastal rail corridor between I-805 and Miramar Road. Improve Miramar Hill by reducing grade and sharp turns.	EA and Design completion late 2016.
Encinitas Pedestrian Crossings	Santa Fe Drive, El Portal Street, Montgomery Avenue, and Hillcrest Drive	Rail Corridor Improvement - Four grade-separated pedestrian crossings including underpasses, landscape improvements, environmental mitigation, and street crossing improvements on adjacent roadways.	Santa Fe Drive-In Service. Others in design
San Elijo Lagoon Double Track	Between approximately Birmingham Drive in Encinitas and Ocean Street in Solana Beach	Rail Corridor Improvement - Add 1.5 miles of second track, enhance existing pedestrian crossing at Chesterfield Drive, and replace San Elijo Lagoon Bridge.	Construction to being in 2016
San Dieguito Double Track	Between approximately Lomas Santa Fe Drive in Solana Beach and Camino Del Mar in Del Mar	Rail Corridor Improvement – 1.7 miles of second track including construction of new double track bridge structures, a special events rail platform at the Del Mar Fairgrounds, and associated improvements.	EA/FONSI Design Completion 2016
Del Mar Bluffs Stabilization Projects	Between Seagrove Park and Torrey Pines State Beach in the City of Del Mar	Rail Corridor Improvement - Stabilized portions of the 1.6 miles of coastal bluffs with soldier piles and an architecturally enhanced pile caps.	Third phase completed spring 2012.
Elvira to Morena Double Track Project	From approximately I-805 south to Balboa Avenue in San Diego	Rail Corridor Improvement - 2 miles of second track and realignment, new universal crossovers, and 4 new bridges.	Under Construction
San Diego River Double Track Project	From Approximately Clairemont Drive overhead to Old Town Station in San Diego	Rail Corridor Improvement - 0.9 miles of second track and realignment, and anew San Diego River Bridge.	Construction to begin in 2016

Source: BRG Consulting, Inc., 2016.

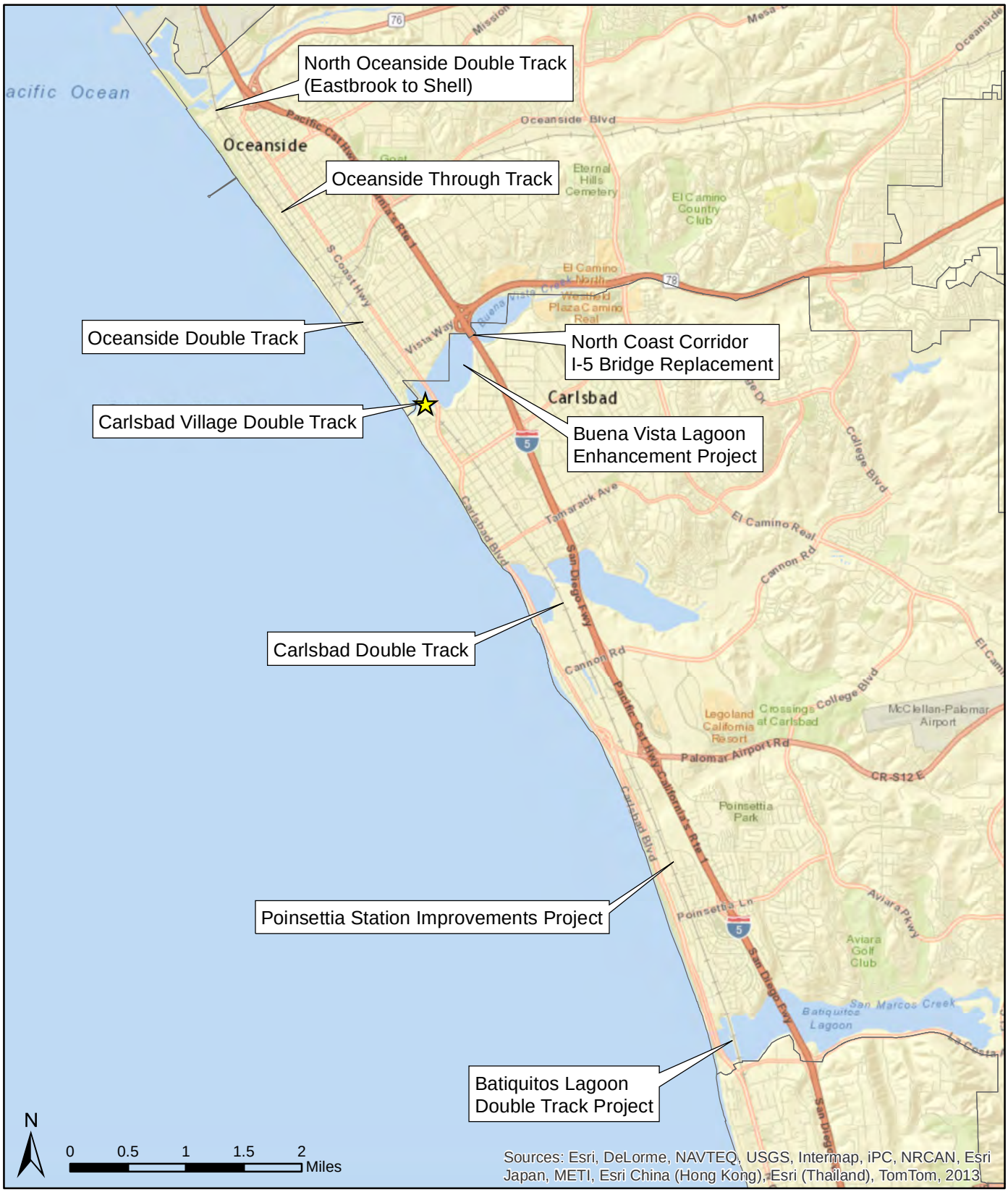


SOURCE: BRG Consulting, Inc., 2016 9/12/16

Carlsbad Village Double Track EA

Cumulative Projects

FIGURE 3.17-1



SOURCE: BRG Consulting, Inc., 2016 9/12/16

Carlsbad Village Double Track EA

Adjacent Cumulative Projects

FIGURE 3.17-2

3.17.2 Adjacent Cumulative Projects

North Oceanside Double Track Project (CP Eastbrook to CP Shell/San Luis Rey River)

The North Oceanside Double Track project is located along the LOSSAN Rail Corridor in the City of Oceanside between Oceanside Harbor and Pier View Way. The North Oceanside Double Track Project will replace the aging single-track bridge over San Luis Rey River with a double track bridge and construct a one-mile stretch of second main track that will join two existing double track segments together. SANDAG is also collaborating with the City of Oceanside to improve the bike and pedestrian undercrossing on the south side of San Luis Rey River rail bridge, redesign the car and pedestrian undercrossing adjacent to the Oceanside Harbor, and construct street median improvements at Surfrider Way to support a future Quiet Zone in Oceanside that would limit train horn noise. Two track crossovers will be installed along the existing railroad tracks between Surfrider Way and Pier View Way to allow trains to cross from one track to the other as they approach or leave Oceanside Transit Center. This project increases the railroad's schedule reliability, operational flexibility, capacity, and level of service by providing a second track where trains can stop to allow other trains to pass. This project is a critical part of the 351-mile LOSSAN rail corridor and serves as a vital link for passenger and freight movements in the San Diego region.

The project site and surrounding area contains wetland and riparian habitat with sensitive vegetation communities that have the potential to support federally listed species, but the project is sited and designed to minimize impacts to such areas. Additionally, the project includes comprehensive on- and off-site mitigation, monitoring, and revegetation plans to mitigate all impacts to wetland habitat. The project includes adequate measures to protect water quality and would reduce automobile congestion, miles traveled, energy consumption, air emissions, and non-point source pollutants into nearby water bodies. The project is in the engineering design phase and is not currently funded for construction. FRA processed a NEPA Categorical Exclusion for this project.

South Carlsbad Double Track and Bridge Project

In cooperation with SANDAG and NCTD, Amtrak finished building the South Carlsbad Double Track and Bridge Project, a 1.9 mile second main track from Carlsbad Village Drive to south of Cannon Road between MP 229.5 and MP 231.4. The South Carlsbad Double Track and Bridge Project included a new rail bridge over the Agua Hedionda Lagoon as well as a new grade crossing expansion at Cannon Road. Additionally, this project included installing new switches to allow trains to change tracks efficiently and wiring and infrastructure to accommodate potential Quiet Zone technology in the future. The South Carlsbad Double Track and Bridge Project eliminated bottlenecks and provided additional travel options on commuter trains. With the completion of this double track project, Carlsbad now has a five-mile stretch of continuous double track. This project is part of a larger effort to improve passenger service trains by adding a second track to the 60-mile segment of the LOSSAN rail corridor in San Diego County. Construction of the project was finished in February 2012. FTA processed a NEPA Categorical Exclusion for this project.

Poinsettia Station Improvements Project

The Poinsettia Station Improvements Project is located in the City of Carlsbad and includes the replacement of the existing at-grade pedestrian rail crossing with a new grade-separated pedestrian undercrossing. In addition, Poinsettia Station's signal system will be modified, and an inter-track fence will be installed to allow for freight and limited stop Amtrak trains to pass through the station while a passenger train is in the station loading/unloading. This project is in the design and permitting phase. FTA processed a NEPA Categorical Exclusion for this project.

Batiquitos Lagoon Double Track Project

The Batiquitos Lagoon Double Track Project is located in the cities of Carlsbad and Encinitas and includes construction of 2.7 miles of second main track in south Carlsbad, replacing the Batiquitos Lagoon Bridge, and expanding the La Costa Avenue grade undercrossing in the City of Encinitas. This project is beginning preliminary design. FTA is processed a NEPA Categorical Exclusion for this project.

Buena Vista Lagoon Enhancement Project

The Buena Vista Lagoon is located in the cities of Carlsbad and Oceanside, in northern San Diego County. The lagoon is bordered by the Pacific Ocean on the west, Vista Way/State Route 78 on the north and Jefferson Street on the east and south. Historically (e.g., pre-1940s), the lagoon was in a dynamic equilibrium between a tidal-influenced saltwater system during dry conditions and a river-influenced freshwater system during wet weather. Over time the lagoon was converted to a freshwater system as a result of highway, roadway, and railroad construction and installation of a weir across the lagoon outlet. The existing weir, built in 1972, established a minimum water level within the lagoon of 5.6 feet AMSL. The lagoon has been progressively degrading in terms of benefits and value to biological communities, habitats, and human uses. Without enhancement, it would most likely become a vegetated freshwater marsh or riparian woodland-meadow within the next 30 to 50 years. This degradation would reduce or eliminate existing wetland functions and values, and result in increased concerns about vectors, water quality impairments, and impacts to aesthetic resources.

Since 2001, numerous federal, state, and local agencies and organizations have been engaged in a planning effort for the enhancement of the lagoon. In addition to this enhancement effort, major ongoing statewide and regional projects/programs will likely influence enhancement design and outcomes for the lagoon, including:

- The San Diego Regional Water Quality Control Board's development of Total Maximum Daily Load regulations for Buena Vista Lagoon;
- The state's climate change adaptation planning, which includes addressing projected sea level rise; and,
- Expansion of the I-5, LOSSAN Rail Corridor and the State Route 78 Interchange.

An optimization study was completed that analyzed the necessary rail bridge lengths that would be required for the restoration of the lagoons along the LOSSAN corridor. Based on this study the existing bridge length across the Buena Vista Lagoon would support any hydrological changes as a result of the restoration of the lagoon. Therefore, lengthening the bridge is not required as part of the Proposed Action. Three enhancement plan alternatives and the no project alternative are addressed in the EIR. The enhancement plan alternatives and their main characteristics are:

Freshwater Alternative

- Expands and deepens open water
- Replaces existing weir and expands from 50' to 80'
- Creates cattail maintenance area

Salt Water Alternative

- Removes weir to create tidal wetlands
- Inlet expanded from 50' to 100'Elevates existing Carlsbad Blvd to accommodate a bridge
- Creates Pedestrian bridge to cross the new inlet

Hybrid Alternative

- Creates new weir under I-5
- Saltwater west of I-5 and freshwater east of I-5
- Design option for a channel guide

Public review of the Draft EIR for this project was completed September 1, 2015 in compliance with the California Environmental Quality Act. As identified in the Draft EIR, significant unavoidable environmental impacts with the implementation of the enhancement plan alternatives include biological resources (temporary); visual resources (temporary and permanent); air quality (temporary); noise (temporary); traffic (temporary); and, public health and safety (permanent). Note that the Freshwater enhancement plan alternative would not result in significant unavoidable environmental impacts to traffic or public health and safety.

I-5 Bridge Replacement (I-5 North Coast Corridor Project)

The I-5 NCC is subject to periods of congestion that are projected to worsen over the next 40 years. The I-5 NCC Project is proposed to maintain or improve future conditions compared to existing conditions, in order to improve the safe and efficient regional movement of people and goods to the project design year. One common design feature to all build alternatives is to 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. The design of the Buena Vista Lagoon has not been finalized as it will depend on the alternative chosen for the Buena Vista Lagoon Enhancement project.

3.17.3 Environmental Consequences

Based on methodologies contained in the CEQ's Considering Cumulative Effects under NEPA (CEQ, 1997), the cumulative analysis in this section analyzes in detail the issues of Air Quality, Biological Resources and Geology and Soils. The area of cumulative effect varies depending on the resource issue analyzed and is referred to as the Resource Study Area (RSA). The cumulative air quality RSA for the Proposed Action encompasses the SDAB. The cumulative RSA for biological resources is generally the Buena Vista Lagoon. The cumulative RSA for geology and soils is the Buena Vista Lagoon and the Carlsbad Village and adjacent residential area.

Proposed Action impacts on other issues/resources would not contribute to adverse cumulative effects because the RSA for such impacts would be limited to a small geographical area in the immediate vicinity of the project and the cumulative projects are too far away to be included in the RSAs for these issues/resources; and therefore, were not analyzed in detail. However, a brief discussion of each environmental resource topic is provided.

The No Action alternative will not have environmental cumulative impacts because this alternative does not involve changing existing conditions and is not discussed further below (except for Section 3.17.3.2 Air Quality).

3.17.3.1 Aesthetics

The Proposed Action is located in an area that includes a lagoon, residential neighborhoods and a commercial district, Carlsbad Village. Two cumulative projects are located within the same viewshed, the Buena Vista Lagoon Enhancement Project and the I-5 bridge replacement. The Proposed Action is to replace an existing rail with a double

track and make improvements to existing facilities. Implementation of the Proposed Action, in combination with the other identified cumulative project in the Proposed Action viewshed, could cause incrementally more visual change in the viewshed than the Proposed Action would alone. However, since the Proposed Action would be similar to the existing condition, since land uses and facility types would not substantially change, and restoration of the Buena Vista Lagoon combined with replacing the I-5 and coast highway 101 bridge could improve the aesthetics of the area by improving the function of the lagoon, views and viewer responses would not be adversely impacted.

Therefore, there will not be an adverse impact to aesthetics, when considering the Proposed Action combined with cumulative projects within the Carlsbad Village or Buena Vista Lagoon viewshed.

3.17.3.2 Air Quality

Cumulative effects are those that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. Caltrans prepared the LOSSAN PEIR/PEIS with FRA, and the final LOSSAN PEIR/PEIS was released in 2007 (FRA, 2009). The proposed action is part of the LOSSAN Program under the Rail Improvements Alternative. The LOSSAN PEIR/PEIS presents a summary of past, present, and foreseeable actions within the study area.

According to the cumulative impact evaluation of the LOSSAN PEIR/PEIS: “Overall, the potential impacts of either the No-Project or Rail Improvements Alternative, in combination with the air quality impacts of other highway and rail projects identified for the cumulative impact analysis and those projects considered in the SIP for air quality, could contribute to cumulative air quality impacts within the two-basin study area”.

Under the Rail Improvements Alternative, locomotive miles in the corridor would increase 17 percent over No-Project levels. This additional mileage would increase emissions of all pollutants by 17 percent over the No-Project Alternative. These additional emissions would potentially cause or contribute to violations of the NAAQS. However, the Rail Improvements Alternative would reduce train congestion and delays along the corridor and the amount of locomotive idling time associated with delays and bottlenecks. Proposed grade separation would reduce vehicular delays and idling at grade crossings throughout the corridor. These benefits would decrease the cumulative contribution of locomotive and vehicular emissions along this corridor. Additionally, the avoidance and minimization and/or mitigation measures required to be implemented for each project in the LOSSAN PEIR/PEIS, along with the cleaner locomotive technologies, would reduce the potential increase in pollutant emissions from the Rail Improvements Alternative. Cumulative contributions to air pollution and GHG emissions from operations will be reduced by installation of diesel particulate filters, fleet turnover to newer technologies, and reduction of idling through infrastructure improvements and automatic anti-idling devices installed on locomotives.

Construction of rail improvements would contribute to short-term cumulative emissions from construction equipment/vehicles and fugitive dust. Emissions, in accordance with the LOSSAN PEIR/PEIS can be managed through timely revegetation of disturbed areas, watering of construction sites, street sweeping, soil stabilization, and restriction on equipment idling times. Additionally, joint construction planning with all cumulative projects in the region may allow for streamlining construction in a manner of reducing construction durations and associated air quality impacts to local communities.

The proposed action would not adversely contribute to the cumulative air quality impacts or GHG emissions during construction or operation after implementation of avoidance and minimization measures outlined in Section 3.2.

No Action Alternative

The No Action Alternative would not result in an increase in air emissions for construction since no construction would occur. Emissions associated with locomotive operations may decrease due to the implementation of federal and California CAA requirements to reduce air emissions; however, due to the less efficient operations associated with the No Action Alternative, air pollutant emissions may be worse in comparison to the Proposed Action. Nonetheless, the No Action Alternative would not contribute to adverse cumulative impacts for air quality or GHG.

3.17.3.3 Biological Resources

As described in Section 3.3, Biological Resources, and shown in Table 3.3-2, the Proposed Action would permanently impact just 0.03 acres and temporarily impact 2.44 acres of sensitive upland habitats. No sensitive upland species are expected to be impacted. Since the other cumulative project in the RSA is an enhancement project, biological resources will be positively impacted.

As described in Section 3.3, Biological Resources, and shown in Table 3.3-3 the Proposed Action would permanently impact up to 1.23 acre and temporarily impact 0.36 acre of jurisdictional wetland habitats and several sensitive species associated with that habitat. Compensatory mitigation via a combination of off-site enhancement, preservation, and/or establishment with a minimum 1:1 of creation/restoration would avoid a net loss of wetlands. Ratios would be determined in consultation with USACE. Wetland and biological resource impacts from this project and from other reasonably foreseeable projects would be implemented with mitigation measures. Because of the nature of the projects, primarily linear transportation projects within the existing ROW, they would not significantly contribute to cumulative impacts. Threatened and endangered species are subject to Section 7 consultation with the USFWS. Section 7 consultation ensures that the cumulative impact to threatened and endangered species is minimized through the requirement for each project to implement conservation measures.

3.17.3.4 Community Impacts and Environmental Justice

In Section 3.4, the Proposed Action has been found to: have mainly beneficial impacts with negligible adverse impacts to the community; not have an environmental justice impact; and, have a positive economic impact. The other cumulative projects are geographically removed from the local community considered for Community and Environmental Justice effects of the Proposed Action. Therefore, when considering the Proposed Action, combined with cumulative projects, there is no community or environmental justice cumulative impact.

3.17.3.5 Cultural and Historical Resources

As described in Section 3.5, Cultural and Historical Resources, there is only one historical resource within the ROW and potential indirect adverse impacts of the Proposed Action will be mitigated by implementation of CHR-1. Indirect impacts to historical resources outside of the ROW are avoided and minimized. Other cumulative projects are not located near these resources. Therefore, when considering the Proposed Action with other cumulative projects, there is no cumulative impact to cultural and historical resources.

3.17.3.6 Geology and Soils

All potential geotechnical impacts associated with the Proposed Action would be avoided or effectively reduced through implementation of mitigation/minimization measures GS-1 through GS-4 and conformance with established regulatory requirements and recommendations of the comprehensive geotechnical evaluation that would be conducted prior to final design of the Proposed Action (refer to Section 3.6). Potential geology and soils effects are also inherently site-specific and would not combine with other planned or proposed development to contribute to cumulative impacts. The only exception is the Buena Vista Lagoon Enhancement Project, which may affect the potential for scour at the new bridge location and a complete scour evaluation is currently being conducted as part of the Buena Vista Lagoon Enhancement Project. The scour potential of all restoration alternatives is expected to increase over the current configuration. The results of the scour analysis would be incorporated into the geotechnical recommendations of this Proposed Action during final design. In order to reduce the possibility of a cumulative impact to geology and soils associated with scour, mitigation measure GS-1 is required.

3.17.3.7 Hazards

The Proposed Action is in compliance with applicable hazard regulations and the cumulative projects are also required to comply with applicable hazard regulations. Additionally, potential hazard effects are inherently site-specific and would not combine with any hazard effects associated with cumulative projects to contribute to cumulative impacts. The Proposed Action will reduce any potential for hazards by conducting preliminary media sampling prior to any intrusive work (mitigation measure HZ-1). Any hazardous material identified by this sampling would be addressed in conformance with applicable regulations.

3.17.3.8 Hydrology and Floodplain

The Proposed Action would maintain the existing overall drainage patterns in the area. The Proposed Action would not increase the peak flows in the existing storm drain system, and thus would not have any adverse impacts to the system. The Proposed Action involves construction of a new double track bridge that would raise the elevation of the tracks by five feet, thereby removing the tracks from within the Special Flood Hazard Area and eliminating potential flood hazard impacts to rail service. The new bridge would also be sufficiently high to avoid flood risks associated with the 100-year storm event occurring coincident with a 5.5 foot increase in mean sea level projected for the year 2100. This would also be sufficiently high to accommodate the additional risk associated with flow changes attributed to the currently anticipated future improvements to the two other Buena Vista Lagoon bridges (the I-5 bridge and the Coast Highway bridge). Additionally, the LOSSAN PEIR/PEIS notes that Rail Improvements Alternative (which includes the Proposed Action) may improve the existing hydrologic conditions at lagoons in northern San Diego County by removal of existing embankments and replacement of existing bridges with open-cell structures, which may increase tidal flow and result in a beneficial effect on lagoon hydrology. Therefore, the Proposed Action when considered with cumulative projects will not have an adverse effect on hydrology and floodplains.

3.17.3.9 Land Use, Zoning and Property Acquisitions

The Proposed Action would occur within the existing rail ROW and is compatible with existing and planned land uses and zoning designations and does not require property acquisitions. This is because improvements would occur along an existing, active railway and no new land uses would be introduced. The proposed rail improvements would provide infrastructure to serve existing and planned development in the Proposed Action area, as well as the LOSSAN corridor

as a whole. The temporary and permanent use areas are all within the ROW and would not preclude development of planned land uses, nor would they conflict with applicable land use and/or zoning designations.

All cumulative projects would be designed to be consistent with relevant local, state, and federal plans and policies. Therefore, the cumulative projects and Proposed Action will not have an adverse effect on land use.

3.17.3.10 Noise and Vibration

Construction of the Proposed Action would generate noise. This temporary noise would comply with all local noise regulations as discussed in Section 3.16.10 Noise and Vibration and would not be considered adverse. However, noise control measures would be implemented to minimize noise impacts. Because noise dissipates with distance from its source and no other cumulative projects are within the vicinity of sensitive receptors, construction of the Proposed Action when considered with other cumulative projects, would not have a cumulative noise impact.

Construction of the Proposed Action may generate vibration levels exceeding FRA thresholds in the vicinity of the Carlsbad Santa Fe Depot, a historic resource. However, mitigation (CHR-1) will be implemented to minimize damage risk to the structure. Other cumulative projects are not within the vicinity of the Depot and thus construction of the Proposed Action when considered with other cumulative projects, would not have a cumulative vibration impact.

The Proposed Action is one of many identified in SANDAG's Infrastructure Development Plan that would facilitate ultimate train trips of 101 trains per day providing the planned level of reliability and on-time performance by the year 2030. Train trips of up to 101 per day could be accommodated without the Proposed Action, but at a lesser level of reliability and on-time performance. Upon completion of construction, the continuing increase in train operation levels to 101 trains expected by the year 2030, coupled with the new alignment of the railroad tracks, could generate noise level increases (see Section 3.10). However, noise levels from the cumulative projects would not be noticeable in the Proposed Action sensitive receptor area because the cumulative projects are too far away and noise dissipates with distance from its source. That is, the cumulative projects would not result in adverse operational noise levels at the Proposed Action site that would be greater than those already described for the Proposed Action. These adverse impacts are not assessed as being substantial because increase in noise levels would be below FRA thresholds for allowable increase in cumulative noise levels. As such, the Proposed Action when considered with other cumulative projects would not contribute to substantial cumulative noise impacts during operation.

Operation of the proposed Action may cause an increase in vibration levels at some locations. At other locations there is no change or a decrease in vibration levels. However, where there is an increase in vibration levels, it is less than FRA thresholds and other cumulative projects are not expected to generate vibrations. Therefore, the Proposed Action, when considered with other cumulative projects, would not contribute to substantial vibration impacts.

3.17.3.11 Parks and Recreation

Temporary noise construction impacts to two parks in the vicinity and the Buena Vista Ecological Reserve would be minimized through implementation of avoidance and minimization measures. There are seven other parks within one half a mile of the parks not affected by the Proposed Action and cumulative projects would not affect any of the nine parks. Cumulative projects, namely the lagoon restoration project (Buena Vista Lagoon Enhancement Project), may affect the Buena Vista Lagoon Ecological Reserve but it is mandated by SB 468 that restoration/habitat enhancement

projects and transportation infrastructure projects within NCC be constructed concurrently, thus reducing the cumulative impact of construction. Therefore, based on the discussion above, there is not a cumulative impact to parks and recreation.

3.17.3.12 Public Health and Safety

As described in Section 3.12, Public Health and Safety, there are no impacts to emergency services, utilities, schools, or hospitals. Therefore, there is not a cumulative impact to public health and safety.

3.17.3.13 Relocation Impacts

The Proposed Action will occur entirely within the rail ROW and does not require property acquisitions nor will it have relocation impacts. Therefore, the Proposed Action cannot cumulatively contribute to relocation impacts.

3.17.3.14 Water Quality

Identified potential short- and long-term project-specific water quality impacts associated with the Proposed Action would be avoided or effectively reduced through conformance with existing regulatory and permit requirements, construction of a bioswale and incorporation of associated BMPs. Because it would not be possible for these efforts to completely eliminate the generation of contaminants, the Proposed Action could incrementally contribute to cumulative water quality impacts. However, these cumulative impacts are not considered substantially adverse because the Proposed Action and identified cumulative projects are subject to the same water quality standards intended to limit urban runoff contaminants, provide regulatory conformance, and address regional (i.e., cumulative) water quality impacts on a watershed-wide basis.

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4.0 COORDINATION AND CONSULTATION

The information provided in this section is a summary of the information provided in the *Pacific Surfliner Carlsbad Village Double-Track Project Public Involvement Plan* (PIP) (SANDAG, 2013c).

As a Metropolitan Planning Organization, SANDAG maintains an updated Public Participation Plan (PPP) (SANDAG, 2012) that outlines public participation requirements for capital projects. The PIP for the Proposed Action has been developed in accordance with the PPP, and thus the joint FHWA/FTA guidelines, "Public Involvement Techniques for Transportation Decision-Making" (1996). It also was drafted to be consistent with the federal and state environmental justice laws, regulations, and requirements, Title VI, related nondiscrimination requirements, and reflect the principles of social equity and environmental justice.

The PIP sets objectives, outlines the public involvement strategy, and defines specific outreach techniques and a timeline for their implementation.

4.1 Agency Coordination

The FRA is the lead agency under NEPA for the Proposed Action. This EA is being conducted so that it meets all relevant public involvement requirements (e.g., SANDAG Board Policy 25 requirements). Coordination with agency partners, such as NCTD, is ongoing and information is being shared for posting on their websites. The design team has had several meetings with Carlsbad and Oceanside City staff to discuss the Proposed Action and obtain input. SANDAG's environmental staff regularly communicates and coordinates with resource agencies to ensure they are kept appraised and knowledgeable of the Proposed Action, its likely impacts to regulated resources, and the project team's public outreach and communications efforts. In order to ensure implementation of the above stated coordination and communication, a master distribution and contact database has been developed for the Proposed Action, which includes agency partners.

Initial resource agency outreach regarding double tracking projects along the coast in San Diego County occurred on November 12, 2009. A representative from the USACE, USFWS, RWQCB, and the CCC were in attendance. The purpose of the meeting was to acquaint the resource agencies with the various double track projects, including the Proposed Action. No additional project specific meetings with the resource agencies have been held.

The project is also part of the overall I-5 NCC Projects PWP/TREP. Meetings on the PWP/TREP have been ongoing since 2009. These meetings are attended by the staff of the aforementioned resource agencies. The PWP/TREP functions to provide an overall understanding of the individual and cumulative impacts of the various projects that comprise the I-5 NCC Projects. Project alternatives analyses, threatened and endangered species survey requirements, sea level rise, impacts, mitigation strategies, project integration, bridge optimization for tidal exchange, and a host of other topics have been addressed during the monthly to quarterly meetings. The PWP/TREP was formally adopted by the CCC during a noticed public hearing on August 13, 2014. Amendments, not related to the Proposed Action were adopted by the CCC on March 9, 2016. Meetings continue to occur on a regular basis, with the recent focus being primarily on the freeway and rail projects in San Elijo Lagoon.

Additionally, the design team has coordinated with the City of Carlsbad. They met with the City of Carlsbad on May 28, 2015, and July 16, 2015 to discuss action alternatives.

4.2 Public Outreach

Communication methods have been established in order to ensure that all of the interested and affected stakeholders are informed of the project and are able to provide input throughout the project development process. Public outreach activities were conducted before and during the NEPA process to ensure public awareness of opportunities to provide input. Public outreach techniques typically include informational public meetings, project update presentation meetings, web-based media, media coordination, resource agency consultation, stakeholder outreach, collateral materials development, materials translation, and video/multimedia (SANDAG, 2013c). The public outreach process began in May 2013 with developing and maintaining a stakeholder database. Following the creation of this database, the PIP was finalized, and the project factsheet was updated (http://www.keepsandiegomoving.com/Libraries/Lossan-doc/1968-FactSheetCarlsbadVillageDoubleTrack_pdf_041315.sflb.ashx). Monitoring, updating of project website, and responding to public inquiries, is ongoing.

The EA, which includes the Proposed Action's potential effect on Historic Properties in Section 3.5, will be available for a 30-day public review and comment period. SANDAG will provide the public notice of the review period and will make the EA available electronically through their website. Public comments received on the EA will be considered by SANDAG and FRA in deciding if a Finding of No Significant Impact or an Environmental Impact Statement must be prepared.

4.3 Consultation

Consultation is required with the following federal and state agencies:

- US Army Corps of Engineers - Clean Water Act Section 404 and Rivers and Harbors Act Section 10. Impact to wetlands and waters of the U.S;
- Regional Water Quality Control Board - Clean Water Act Section 401. Required for a Section 404 permit;
- California Coastal Commission – Coastal Zone Management Act Federal Consistency Certification;
- US Fish and Wildlife Service Endangered Species Act Section 7. Required due to impacts to listed species;
- National Marine Fisheries Service (NMFS) - Endangered Species Act Section 7. Required due to impacts to listed species and Magnuson–Stevens Fishery Conservation and Management Act for impacts to Essential Fish Habitat;
- State Historic Preservation Office - National Historic Preservation Act Section 106. For impacts to cultural or historical resources.

Consultation for impoundment impacts to water is not required with state CDFW because there is less than 10 acres of impact to water (16 USC 662(h)). FRA sent a letter dated August 3, 2017 to SHPO initiating the consultation under Section 106. Consultations with USFWS and NMFS has been initiated by FRA. Both consultations are pending. Permit applications to the USACE/RWQCB and CCC would need to be submitted by SANDAG once NEPA is complete.

5.0 DISTRIBUTION LIST

This EA was distributed to the state, regional, and local agencies listed in this section as well as potentially impacted parcel owners in the project area.

Federal Agencies

Col. Kirk. E. Gibbs
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Potentially Impacted Parcel Owners

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State of California

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Carlsbad, CA 92008

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APN 15519009
State of California Wildlife Reserve

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APN 15519012
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APN 15519014
State of California

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BRG, 2017

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BRG, 2016

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