Northwest State Route 138 Corridor Improvement Project

Los Angeles County, CA
DISTRICT 7- LOS ANGELES
07-LA-138 (PM 0.0/36.8)
07-LA-05 (PM 79.5/83.1)
07-LA-14 (PM 73.4/74.4)
EFIS 0700001816, EA 265100

FINAL ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT and SECTION 4(f) EVALUATION

Prepared by the State of California Department of Transportation

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 USC 327.

June 2017

Metro

Caltrans

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SCH# 2013111016
07-LA-138-PM 0.0/36.8
07-LA-05-PM 79.5/83.1
07-LA-14-PM 73.4/74.4
EA 26510
EFIS 0700001816

Widen and Improve State Route 138 (PM 0.0/36.8) from Interstate 5 to State Route 14 in Northern Los Angeles County.

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

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C) and 49 USC 303
THE STATE OF CALIFORNIA
Department of Transportation

COOPERATING AGENCIES:
U.S. Environmental Protection Agency, Region IX,
U.S. Army Corps of Engineers,
U.S. Fish and Wildlife Services
Advisory Council on Historic Preservation

RESPONSIBLE AGENCIES:
California Transportation Commission
California Department of Fish and Wildlife,
California Water Quality Control Board
Lahontan Regional Water Quality Control Board
Los Angeles County Metropolitan Transportation Authority

6/28/2017
Date of Approval

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Abstract: The proposed project would improve mobility and operations, enhance safety, and accommodate foreseeable increases in travel and goods movement. The project is needed to bring roadway features up to current standards, improve connectivity, and because future demand would exceed the current facility capacity. Substantial environmental effects are anticipated to a historical resource/historic property, cumulative effects, and noise in relation to CEQA.

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SUMMARY

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under NEPA as well as CEQA. In addition, FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, quite often a "lower level" document can be prepared for NEPA. One of the most commonly seen joint document types is an Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, in cooperation with Metro, held two public hearings in August 2016. All comments received during the public review period have been considered. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS was completed. The lines shown in the right margin throughout the Final EIR/EIS indicate where changes have been made. After the Final EIR/EIS is made available, if Caltrans decides to approve the project, a Notice of Determination will be published for compliance with CEQA, and a Record of Decision would be published for compliance with NEPA. If impacts cannot be mitigated below a level of significance, Caltrans will also prepare a Statement of Overriding Considerations.

S.1 INTRODUCTION AND BACKGROUND

The existing State Route 138 (SR-138) between Interstate 5 (I-5) and State Route 14 (SR-14) is a 2-lane conventional highway that contributes to the local circulation network and provides an alternate route for west to east traffic in northwest (NW) Los Angeles County. The NW SR-138 Corridor Improvement Project (project) would widen SR-138 and provide operational and safety improvements. The project corridor spans west to east approximately 36.8 miles (Post Mile [PM] 0.0 to PM 36.8) in the NW portion of Los Angeles County, just south of the Kern County border. It also includes improvements to the connections ramps on I-5 on the west and connection ramps and structure over the SR-14 on the east.

S.2 PURPOSE AND NEED

The purpose of this project is to:

- Improve mobility and operations on SR-138 and in NW Los Angeles County;
- Enhance safety within the SR-138 Corridor based on current and future projected traffic conditions;
- Accommodate foreseeable increases in travel and goods movement within northern Los Angeles County.

The need for the project is based on an assessment of the future transportation demands, existing capacity of the facility, historic accident data, existing non-standard roadway features, present and future social demands, and forecasted economic development.

S.3 PROPOSED ACTION

The proposed project would improve SR-138 between the I-5 interchange and the SR-14 interchange. The project limits are from Post Mile (PM) 0.0 to PM 36.8 on SR-138, PM 79.5 to 83.1 on I-5, and PM 73.4 to 74.4 on SR-14. The scope of the project is focused on SR-138 between I-5 and SR-14 in northern Los Angeles County. Based on the results of the alternatives' evaluation, two build alternatives have been identified that would meet the project's purpose and need. These alternatives, as well as the No-Build Alternative, have been assessed for their full environmental impacts.

Several alternatives were deemed "non-viable" and thus would not be analyzed further either from an engineering, cost, or environmental standpoint (for further discussion, please refer to Section 2.1.3 "Alternatives Considered but Eliminated from Further Discussion"). A brief description of each viable alternative analyzed and considered for the project is described below.

S.3.1 NO BUILD ALTERNATIVE

This alternative would maintain the current configuration of the existing freeway, ramps, and local intersections within the project limits. No improvements would be made to SR-138.

S.3.2 BUILD ALTERNATIVE 1- Freeway/ Expressway

Alternative 1 (Freeway/Expressway) would include a 6-lane freeway from the I-5 interchange to 300th Street West , and a 4-lane expressway from 300th Street West to the SR-14 interchange generally following the existing alignment of SR-138. Alternative 1 proposes a combination of mainline intersection treatment options included displaced left-turns, restricted crossing median U-turns, roundabouts, and grade separated interchanges. Other intersection treatments, such as jug-handles and signals were considered and were also concluded to be feasible options. The decision on the actual intersection treatment will be determined during the final design phase. It would also include improvements (such as auxiliary lanes) on the I-5 and SR-14 freeway connectors, from PM 79.5 to PM 83.1 on I-5 and PM 73.4 to PM 74.4 on SR-14.

BUILD ALTERNATIVE 1 WITH DESIGN OPTION

Antelope Acres Bypass. There is a design option with this alternative to include a bypass route around the Antelope Acres community. This option was developed to reduce the impacts to the community of Antelope Acres due to the proposed four-lane expressway along the existing alignment of SR-138. The alignment would bypass the community to the north along West Avenue C and going from west to east, the alignment would begin to deviate from the existing SR-138 near 100th Street West and continue in a northeasterly direction towards West Avenue C. After paralleling West Avenue C for approximately 1.0 mile, the alignment would continue in a southeasterly direction back towards the existing SR-138, and eventually join the existing SR-138 near 70th Street West. The existing highway would be relinquished to the County as a local roadway between 100th Street West and 70th Street West, with additional speed reduction measures proposed to reduce cut-through traffic.

S.3.3 BUILD ALTERNATIVE 2- Expressway/Limited Access Conventional Highway

Caltrans, as lead agency under NEPA, as assigned by FHWA, and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. Alternative 2 (Expressway/Highway) would include a 6-lane freeway from the I-5 interchange to Gorman Post Road, a 6-lane Expressway from Gorman Post Road to 300th Street West, a 4-lane expressway from 300th Street West to 240th Street West, and a 4-lane limited access conventional highway from 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. Access along the corridor would be provided by at-grade intersections with the exception of a tight diamond interchange at Gorman Post Road. Between Gorman Post Road and SR-14, all existing intersections with major roadways would be modified to restrict access to higher traffic roadways in order to improve safety and operations of the facility. Additional intersection treatment options considered and determined to be feasible include displaced left-turns with median U-turns, roundabouts, and jug-handles. The decision on the actual intersection treatment will be determined during the final design phase. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections and to the structure that crosses over SR 14. The study limits on these connectors would be the same as Build Alternative 1; on I-5 from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4.

S.4 PROJECT IMPACTS

Environmental impacts associated with the proposed No Build Alternative, Build Alternative 1, Build Alternative 1 with Antelope Acres Design Option, and Build Alternative 2 were fully analyzed, and the results are summarized in Table S-1.

TABLE S-1: SUMMARY OF MAJOR POTENTIAL IMPACTS FROM ALTERNATIVES

Potential Impact (References to "significance" are pursuant to CEQA)	No Build	Build Alternative 1	Build Alternative 1 with Antelope Acres Loop Design Option	Build Alternative 2
Land Use and Planning (Consistency with General Plan)	No Impacts	Antelope Acres would be spatially divided if Build Alternative 1 was implemented. No significant impacts with the inclusion of the proposed minimization and/or mitigation measures. Consistent with General Plan.	Consistent with General Plan, no significant impacts.	Antelope Acres would be spatially divided if Build Alternative 2 was implemented. No significant impacts with the inclusion of the proposed minimization and/or mitigation measures. Consistent with General Plan.
Community/ Economic	No Impact	Alternative 1 would bisect the Antelope Acres community. It would benefit the community by providing safer crossings. It would impact the community by limiting access and change the community character with the widening of the roadway and other highway safety features (ie. guardrails etc.)	No significant impacts with the inclusion of avoidance and minimization measures identified.	Alternative 2 would bisect the Antelope Acres community. It would benefit the community by providing safer crossings. It would impact the community by limiting access and change the community character with the widening of the roadway and other highway safety features (ie. guardrails etc).
Farmland	No Impact	Permanent Impacts would occur to 0.75 acres of Unique Farmland, 21.5 acres of Prime Farmland, and 1104 acres of Grazing Land. There would be no impacts to farmland of Statewide Importance (as classified by the CA Department of Conservation).	Permanent Impacts would occur to 1.5 acres of Unique Farmland, 21.5 acres of Prime Farmland, and 1121 acres of Grazing Land. There would be no impacts to farmland of Statewide Importance (as classified by the CA Department of Conservation).	Permanent Impacts would occur to 0.75 acres of Unique Farmland, 21.5 acres of Prime Farmland, and 184 acres of Grazing Land. There would be no impacts to farmland of Statewide Importance (as classified by the CA Department of Conservation).

Potential Impact (References to "significance" are pursuant to CEQA)	No Build	Build Alternative 1	Build Alternative 1 with Antelope Acres Loop Design Option	Build Alternative 2
Housing Displacement/ Business Displacement	No housing units or businesses would be displaced	An estimated 17 housing units/ 2 businesses would be displaced.	An estimated 11 housing units/ 2 businesses would be displaced.	An estimated 14 housing units/ 2 businesses would be displaced.
Environmental Justice	No Environmental Justice (EJ) impacts	No EJ impacts.	No EJ impacts	No EJ impacts
Utilities and Emergency Services	No disruption or displacement	Utilities would be relocated along the corridor. No significant impacts are anticipated.	Same as Alternative 1	Same as Alternative 1
Traffic, Pedestrian and Bike Access	No impacts or improvements	Existing facilities would be maintained and/or enhanced.	Same as Alternative 1	Same as Alternative 1
Visual Quality	No change in visual quality or character	Visual impacts would be less than significant with the avoidance and minimization measures included.	Same as Alternative 1	Same as Alternative 1
Cultural/ Historical Resources	No impact	1 Historic property would be adversely affected.	Same as Alternative 1	Same as Alternative 1
Paleontological Resources	No Impact	Implementation of the paleontological resources mitigation plan would facilitate the identification and treatment of paleontological resources. Impacts would be less than significant.	Same as Alternative 1	Same as Alternative 1

Potential Impact (References to "significance" are pursuant to CEQA)	No Build	Build Alternative 1	Build Alternative 1 with Antelope Acres Loop Design Option	Build Alternative 2
Archeological Resources	No impact	Impacts to archaeological resources are still unknown as access is restricted to certain properties. A Programmatic Agreement with the State Historic Preservation Officer was approved on June 23, 2017to establish a phased identification and evaluation process once access is granted. If eligible historic properties are identified as adversely affected, mitigation measures will be identified to reduce impacts.	Same as Alternative 1	Same as Alternative 1
Flood Control/ Hydrology/ Water Quality/ Stormwater	No impact	With implementation of recommended measures, Best Management Practices (BMPs) and development of a Storm water Mitigation Plan (SWMP), direct impacts associated with Alternative 1 would be less than significant.	Same as Alternative 1	With implementation of recommended measures, BMP's and development of a SWMP, direct impacts associated with Alternative 2 would be less than significant.
Geology/ Soils/ Seismicity	No impact	Potential impacts would be temporary, and exposed soils and cut slopes would be stabilized after construction is complete. No significant impacts with appropriate avoidance, minimization, and/or mitigation measures.	Same as Alternative 1	Same as Alternative 1

Potential Impact (References to "significance" are pursuant to CEQA)	No Build	Build Alternative 1	Build Alternative 1 with Antelope Acres Loop Design Option	Build Alternative 2
Hazardous Waste/ Materials	No impact	Project-specific impacts related to hazardous waste/materials would be avoided, minimized and mitigated through conformance with applicable regulatory requirements and implementation of the avoidance, minimization, and/or mitigation measures.	Same as Alternative 1	Same as Alternative 1
Air Quality	Potentially inconsistent with regional plans and programs such as the 2016 Regional Transportation Plan and 2017 Federal Transportation Improvement Plan since the project would not be constructed as approved in the Regional Transportation Plan for the area.	During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. No significant impacts with the implementation of the avoidance, minimization, and/or mitigation measures described.	Same as Alternative 1	Same as Alternative 1
Noise	No change in noise.	Noise would increase- significant impacts under CEQA for some properties.	Same as Alternative 1	Same as Alternative 1
Energy	No impact	No impact	No impact	No impact

Potential Impact (References to "significance" are pursuant to CEQA)	No Build	Build Alternative 1	Build Alternative 1 with Antelope Acres Loop Design Option	Build Alternative 2
Biological Resources	No impact	Potential to permanently impact 4.57 acres and temporarily impact 0.72 acres of southern cottonwood willow riparian forest and southern willow scrub. Approximately 14.74 acres of Joshua tree woodland, and 81.29 acres of California juniper woodland may be potentially impacted. Potential to have permanent impacts to no more than 1.63 acres of WUS found within the BSA. In addition, five (5) special-status plants and 28 special-status wildlife species have the potential to be impacted. Potential impacts to several desert kit fox dens, burrowing owl, and foraging habitat loss of Swainson's hawk and golden eagle.	Same as Alternative 1	Potential to permanently impact 4.57 acres and temporarily impact 0.72 acres of southern cottonwood willow riparian forest and southern willow scrub. Approximately 7.71 acres of Joshua tree woodland, and 68.06 acres of California juniper woodland may be potentially impacted. Potential to have permanent impacts to no more than 1.63 acres of WUS found within the BSA. In addition, five (5) special-status plants and 28 special-status wildlife species have the potential to be impacted. Potential impacts to several desert kit fox dens, burrowing owl, and foraging habitat loss of Swainson's hawk and golden eagle.
Section 4(f) Properties	No impact	Individual evaluation for the Historic property (Kinsey mansion) and three *de minimus* findings for historic resources.	Same as Alternative 1	Same as Alternative 1
Cumulative and Secondary Impacts	None	Biological Resources (Natural Communities), Noise (Substantial Noise Increase- CEQA), and Farmland.	Same as Alternative 1	Same as Alternative 1
Estimated Project Cost	No cost	$830 million	$839 million	$725 million

S.5 MITIGATION MEASURES

Several of the project elements have been modified to avoid or minimize potential environmental impacts. Proposed mitigation measures are listed in Table S-2, where avoidance and minimization attempts could not fully resolve the impacts. Implementation of the mitigation measures below would result in less than significant impacts.

TABLE S.2: PROPOSED MITIGATION MEASURES

Environmental Impact	Build Alternative 1	Build Alternative 1 with Antelope Acres Bypass Design Option	Build Alternative 2
Cultural/ Historical Resources	Caltrans will provide project design plans to the State Historic Preservation Officer (SHPO) for review and comment for the retaining wall, fencing, and relocated driveway associated with the Kinsey Mansion to ensure conformance with the Secretary of Interior's Standards for the Treatment of Historic Properties. Caltrans will also create electronic content for a smartphone traveler application that describes and interprets the historic and cultural properties along the State Route 138, between Interstate 5 and State Route 14.	Same as Alternative 1	Same as Alternative 1
Paleontological Resources	Paleontological Mitigation Plan (PMP)	Same as Alternative 1	Same as Alternative 1
Noise	Noise abatement walls in coordination with the affected community (CEQA-only)	Same as Alternative 1	Same as Alternative 1
Biological Resources	Through early coordination with CDFW and due to the sensitive status of various species, off-site mitigation parcels of equal habitat quality will be purchased at a 2 to 1 ratio. To reduce the impacts to foraging habitat, similar habitat within the region should be preserved in perpetuity. Caltrans will develop the appropriate level of off-site mitigation for this project through consultation with USFWS and CDFW, as well as restore disturbed habitat to preconstruction conditions with the use of native vegetation for landscaping. The HMMP that will be prepared for the project will cover agency coordination and approved compensatory mitigation plan for foraging habitat.	Same as Alternative 1	Same as Alternative 1

Environmental Impact	Build Alternative 1	Build Alternative 1 with Antelope Acres Bypass Design Option	Build Alternative 2
Cumulative Effects	Farmland would have a cumulatively considerable effect. Caltrans will enter into an agreement with the DOC California Farmland Conservancy Program to preserve farmland. Impacts to Natural Communities would be mitigated on and off-site at 2:1.	Same as Alternative 1	Same as Alternative 1

S.6 COORDINATION WITH PUBLIC AND OTHER AGENCIES

Caltrans and Metro have initiated an outreach program that has included a number of meetings with elected officials, town councils, stakeholders, and the community at large. The public has been kept apprised of the status of the project and provided input through the scoping process. The public would be able to continue to provide input on the project as it proceeds through the environmental process and design phase. A Notice of Preparation (NOP) and Notice of Intent (NOI) were issued in November 2013. The NOI was published in the Federal Register on November 13, 2013. Permits and approvals that may be required for construction of the project are listed in Table S-3.

Two scoping meetings were held in March 2014 and four Cooperating and Participating agency meetings were held between March 2014 and June 2015. The comments from the scoping meetings focused on the following issues: Water supply, maintaining the rural setting of the area, right-of-way impacts, safety improvements, bicycle corridor enhancements, and support for the option that does not displace residents.

In May 2015, two open houses were held to update the public and other interested stakeholders on the proposed project and provide information on the Alternatives. Approximately 180 people attended the meetings; 110 on May 2nd and 70 on May 4th. Each of the meetings featured an open house format allowing the public to receive updates through information stations and to have their questions answered by technical staff. For ease of access, one of the meetings was held on the Western side of the Northwest 138 Corridor and the other one at the Eastern side of the project limits. The Draft EIR/EIS prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, in cooperation with Metro, held two public hearings in August 2016.

In addition, briefings and project update meetings with elected officials, resource agencies and homeowner associations in the project area have been held to present project updates and receive feedback. Chapter 5 includes a full description of public coordination efforts and meetings. After the public hearing and circulation of the environmental document, Caltrans would continue the outreach effort with the community.

S.7 IDENTIFICATION OF PREFFERED ALTERNATIVE

Caltrans, as lead agency under NEPA, as assigned by FHWA, and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. The Preferred Alternative would include a 6-lane freeway from the I-5 interchange connector ramps to Gorman Post Road, a 6-lane expressway from the Gorman Post Road interchange to 300th Street West, a 4-lane expressway from 300th Street West to 240th Street West, and a 4-lane limited access Conventional Highway from

240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. The Preferred Alternative would meet the project's Purpose and Need, as discussed in Section 1.2. This alternative would improve mobility and operations on SR-138 and in NW Los Angeles County, enhance safety within the SR-138 Corridor based on current and future projected traffic conditions, and accommodate foreseeable increases in travel and goods movement within northern Los Angeles County. In addition to the above, the following sections contains other factors that were considered in the identification of the Preferred Alternative.

Natural Resource Factors

- The Preferred Alternative would result in less impact to Joshua Tree Woodland compared to Alternative 1.

- The Preferred Alternative would result in less impact to Grazing Land, as classified by the California Department of Conservation, compared to Alternative 1.

Community Impact and Local Planning Factors

- The Preferred Alternative is consistent with County of Los Angeles land use and community planning goals, policies and objectives as framed by the Los Angeles County General Plan and Antelope Valley Area Plan as discussed in Section 3.1.1.1, Existing and Future Land Use.

- The Preferred Alternative would result in less impact to Agricultural Land Uses, as designated by the Los Angeles County General Plan and Antelope Valley Area Plan, compared to Alternative 1.

- The Preferred Alternative would result in less displaced residential units compared to Alternative 1 without the Antelope Acres Design Option.

TABLE S.3: PROJECT PERMITS AND APPROVALS

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species (May Affect, Not Likely to Adversely Affect Concurrence Letter)	Concurrence obtained on January, 5, 2017.
United States Army Corps of Engineers (USACE)	Section 404 Nationwide Permit	Application to be submitted and permit to be obtained prior to the project Ready-to-List (RTL).
California Department of Fish and Wildlife (CDFW)	1602 Agreement 2081 Take Permit	Application to be submitted and permit to be obtained prior to the project Ready-to-List (RTL).
Regional Water Quality Control Boards (RWQCB) Los Angeles & Lahontan	National Pollutant Discharge Elimination System (NPDES) Permit (includes BMPs)	Applications to be submitted and permits to be obtained prior to the project Ready-to-List (RTL).
California State Water Resources Control Board (SWRCB)	Water Discharge Permit, Water Quality Order (WQO) 2009-0009-DWQ, approval of Notice of Intent (NOI) to comply with General Construction Activity National Pollutant Discharge Elimination System Permit (CWA Section 402), and CWA Section 401 Certification	NOI to be submitted during the design phase.
Los Angeles County	Freeway or Controlled Access Highway Agreement	To be implemented following project approval.
Department of Water Resources (DWR)	Review / Approval of Quail Lake Outlet modifications.	An encroachment permit to construct would be required. Improvements would be designed under an encroachment permit application/agreement.
Federal Energy Regulatory Commission (FERC)	Review of EIR/EIS	DWR would coordinate the review of the Draft Environmental Document with FERC as part of their responsibility as owner of the facility.
Federal Highway Administration (FHWA)	Draft Financial Plan and Project Management Plan	Needed prior to Record of Decision (ROD).
State Historic Preservation Officer (SHPO)	Finding of Effect and Programmatic Agreement	Finding of Effect concurrence obtained on April 11, 2017. The Programmatic Agreement was executed on June 23, 2017.

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LIST OF TECHNICAL STUDIES

Air Quality Analysis | LSA Associates (March 2016, revised May 2017)
Community Impact Analysis | Caltrans Division of Environmental Planning and Design (April 2016, revised December 2016)
Revised Final Preliminary Geotechnical Report | Kimley-Horn and Associates (July 2015)
Materials Report | Kimley- Horn and Associates (October 2015)
Historic Property Survey Report | ECORP Consulting, Inc. (November 2015)
Historic Resources Evaluation Report | ECORP Consulting, Inc. (August 2015)
Archeological Evaluation Report (AER) l ECORP Consulting, Inc. (August 2015, revised May 2016)
Archeological Survey Report (ASR) |ECORP Consulting, Inc. (August 2015, revised June 2016)
Supplemental ASR |ECORP Consulting, Inc. (August 2015)
Second Supplemental ASR |ECORP Consulting, Inc. (November 2016)
Extended Phase I Geoarcheological Report | ECORP Consulting, Inc. (February 2015)
Ethnohistory Report |ECORP Consulting, Inc. (May 2015)
Finding of Adverse Effect (FAE) l ECORP Consulting, Inc. (August 2015, revised November 2016)
Natural Environment Study Report| Caltrans Division of Environmental Planning (September 2015, revised July 2016 and May 2016)
Initial Site Assessment | Stantec, Inc. (May 2015)
Preliminary Drainage Report l Kimley-Horn and Associates (June 2015)
Storm Water Data Report (SWDR) Kimley-Horn and Associates (July 2015)
Traffic Noise Study Report | Caltrans Division of Environmental Planning and Design (August 2015, revised August 2016)
Noise Abatement Decision Report (NADR) l Kimley- Horn and Associates (November 2015, revised January 2017)
Transportation Analysis Report | Kimley-Horn and Associates (August 2015)
Visual Impact Assessment (VIA) | Caltrans Division of Landscape Architecture (August 2015)
Energy Technical Report | GPA Consulting (November May 2017)
Relocation Impact Report | GPA Consulting (November 2015, revised March 2017)
Water Quality Report l GPA Consulting (November 2015, revised March 2017)
Paleontological Identification and Evaluation Report I ECORP Consulting Inc. (December 2014)

CHAPTER 1 | PROPOSED PROJECT

1.1 INTRODUCTION

The California Department of Transportation (Caltrans), in cooperation with the Los Angeles County Metropolitan Transportation Authority (Metro), propose to widen and improve approximately 36.8 miles of State Route 138 (SR-138) between the Interstate 5 (I-5) interchange and the State Route 14 (SR-14) interchange. Caltrans is the lead agency for the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Figure 1 depicts the project location and project vicinity map and Figure 2 shows the project location on a larger regional scale in relation to the entire State of California.

The existing facility is a 2-lane highway that contributes to the local circulation network and provides an alternate route for east-west traffic in northwest (NW) Los Angeles County. The NW SR-138 Corridor Improvement Project (project) would widen SR-138 and provide operational and safety improvements. The project corridor spans west to east approximately 36.8 miles (Post Mile [PM] 0.0 to PM 36.8) in the NW portion of Los Angeles County, just south of the Kern County border.

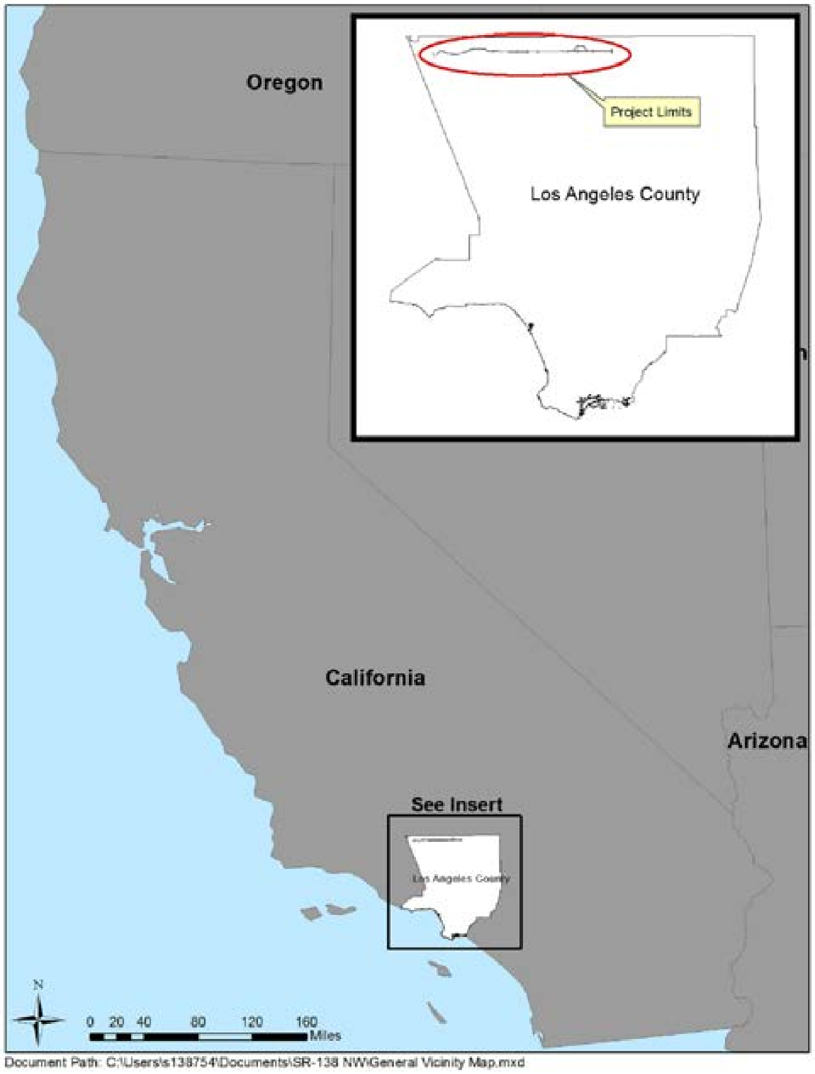
The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, in cooperation with Metro, held two public hearings in August 2016. All comments received during the public review period have been considered and responded to. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS was completed. Caltrans, as lead agency under NEPA, as assigned by the Federal Highway Administration (FHWA), and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. The Preferred Alternative would meet the project's Purpose and Need, as discussed in Section 1.2.

The Metro 2010 – 2039 Measure R Expenditure Plan includes $200 million for "State Route 138 Capacity Enhancements" (Metro, 2008). Of that total, $25 million was allocated for the segment of SR-138 between I-5 and SR-14 for project approval and environmental documentation (PA&ED), to be used between 2012 and 2018. This portion of the funding was approved by the Federal Highway Administration (FHWA) and has been included in the Southern California Association of Governments (SCAG) Final Adopted 2013 Federal Transportation Improvement Program (FTIP) project listing as Project ID #LA0G949 (SCAG, 2013). The project is also in the 2017 Federal Transportation Improvement Program (FTIP), which was found to be conforming by the FHWA/FTA on December 16, 2016 (Project ID: LA0G949*; Complete PA&ED to determine the alternatives for the approximate 36.8-mile east-west SR-138 highway facility between I-5 and SR-14 in northern Los Angeles County. The PA&ED will study and determine the alternatives (i.e., freeway and/or expressway), constraints (right-of-way requirements), potential impacts/improvements and conduct technical studies)*.

Figure 1 Project Location -Vicinity Map

Source: Caltrans, Draft Project Report, October 2015

Figure 2 Project Location- Regional Map



1.2 PURPOSE AND NEED

PROJECT PURPOSE

Generally, a project purpose aids decision-making by providing clear objectives and a basis for comparing alternatives. Aiming to meet the needs identified within the SR-138 Corridor, the purpose of this project is to:

- Improve mobility and operations on SR-138 and in NW Los Angeles County;
- Enhance safety within the SR-138 Corridor based on current and future projected traffic conditions;
- Accommodate foreseeable increases in travel and goods movement within northern Los Angeles County.

The project alternatives represent a reasonable expenditure of public funds because both Build Alternatives are projected to achieve the bullet points listed above and meet the purpose of the project. As discussed in section 3.1.6, with the implementation of either Build Alternative, mobility and safety would be improved compared to the No-Build conditions for 2040.

Proposed improvements such as a standard clear recovery zone (which is an area clear of fixed objects adjacent to the traveled way), curve corrections, grade- separated interchanges, enhanced channelization at intersections, and standard shoulder widths are anticipated to enhance safety in the corridor. Based on the forecast growth of population and employment in northern Los Angeles County, (Table 4) the existing facility will see a large increase and would require additional capacity to maintain an acceptable Level of Service for the corridor. The Build Alternatives would address the purpose of the project.

PROJECT NEED

The existing SR-138 Corridor is located in the Antelope Valley in the Northwest corner of Los Angeles County, just south of the Kern County border; the highway is the main east-west route connecting the I-5 to Antelope Valley, Lancaster, Palmdale and other High Desert communities. SR-138 provides one of the primary routes for west-east traffic in NW Los Angeles County, and is an important strategic route during emergency closures of I-5 or SR-14 in this area. In the coming decades, NW Los Angeles County is anticipated to experience large-scale growth and increased economic activity, which is projected to generate traffic demands beyond the capacity of the existing facility. To address these needs, the NW SR-138 Corridor Improvement Project has been proposed. The need for the proposed project is derived from foreseeable increases in travel and goods movement and higher than average state-wide fatal accident rates (actual rate of 0.046/Million Vehicle Mile (MVM) versus 0.023/MVM for the statewide average).

- ***CAPACITY AND LEVEL OF SERVICE -*** The need for the project is based on an assessment of the existing and future transportation demand in the project area compared to the existing capacity of the facility. The existing SR-138 through the project area is a 2-lane facility (one lane in each direction) that has at-grade intersections with both paved and unpaved roads and driveways. According to the Existing Conditions Report prepared for the project, segments of SR-138 in the project area were measured to have average daily traffic (ADT) volumes of between 3,500 to 4,500 vehicles with the highest peak volume of vehicles traveling along SR-138 occurring at approximately 6:00 A.M. and approximately 3:30 P.M.

  According to existing travel conditions and projected future traffic (2035) based upon the SCAG 2012 V6.1 Model, SR-138 experiences and is anticipated to experience traffic volumes in excess of its existing capacity. The North County Sub-Area model was used to develop travel demand forecasts under each Build Alternative based on the increase in capacity along the corridor. Both daily and peak hour traffic forecasts were obtained from the model to reflect Year 2035 traffic conditions based on planned improvements and growth in the study area. Since the subarea model reflects Year 2035 conditions, the Design Year 2040 forecasts were developed using a calculated annual growth rate between existing volumes and the 2035 traffic forecasts, and extending the growth projections to Year 2040. Table 1 displays the ADT forecasts for each segment of the project alternatives under current and 2040 conditions. Under both build alternatives, forecast ADT volumes for year 2040 for the SR-138 segments (ID #8 through 13) would be more than twice the No Build volumes for year 2040. There are several locations with unacceptable levels of service in the no build alternative due to the growth of the traffic volumes. For further information see section 3.1.6 Traffic and Transportation/Pedestrian and Bicycle Facilities.

Table 1: Current and 2040 ADT Forecasts and Volumes

ID	Location	2012 Subarea Model	2040 Subarea No Build	2040 Subarea Alternative 1	2040 Subarea Alternative 2
1	I-5 North of SR138	70,600	110,900	124,500	122,600
2	I-5 South of SR138	67,900	122,300	125,800	125,800
3	I-5 NB Off-Ramp to SR-138	600	13,250	22,080	21,640
4	I-5 NB On-Ramp to SR-138	1,335	9,400	16,200	15,900
5	I-5 SB Off-ramp to SR-138	1,195	8,350	14,400	14,100
6	I-5 SB On-Ramp to SR-138	675	13,990	24,120	23,640
7	SR-138 East of I-5	4,500	40,700	73,600	71,500
8	SR-138 West of 300th Street West	4,500	30,500	68,400	66,200
9	SR-138 West of 245th Street West	4,000	23,500	54,700	52,700
10	SR-138 West of 190th Street West	3,500	17,500	48,300	46,100
11	SR-138 West of 110th Street West	3,700	18,200	45,800	43,200
12	SR-138 West of 60th Street West	3,800	17,500	42,000	38,500
13	SR-138 West of SR14	3,800	17,100	39,100	35,700
14	SR-14 North of SR138	44,300	64,200	56,700	58,300
15	SR-14 South of SR138	46,400	66,300	68,100	68,000

Fehr & Peers, Northwest 138 Corridor Traffic Analysis, June 2015

SAFETY- Traffic collision data from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) for the highway sections on SR-138 were obtained for the three-year period between April 1, 2009 and March 31, 2012. Within the study area, 121 collisions occurred in the 3-year period. The TASAS summary was divided into three sections according highway facility type, and the data is presented in the following tables. Table 2 shows the collision history along the section of SR-138 consisting of highway mainline segments from Post Mile (PM) 0.0 to 39.956.

Table 2: NW SR-138 Accident Rates (2009 to 2012)

Location	Number of Accidents				Actual Collision Rate[1]			Statewide Collision Rate[1]		
	Total	Fatal	Injury	F+I	F	F+I	Total	F	F+I	Total
SR-138 Mainline PM 0.0 – 1.391 R	1	0	0	0	0.000	0.00	0.39	0.023	0.28	0.61
SR-138 Mainline PM 0.0 – 1.246 L	0	0	0	0	0.000	0.00	0.00	0.018	0.22	0.50
SR-138 Mainline PM 1.392 – 39.956	118	6	52	58	0.046	0.44	0.89	0.023	0.44	0.96

Note: The accident rate is accidents per million vehicle-miles. "F" refers to the fatality rate, and "F&I" refers to the fatality and injury rate. Total number of accidents includes non-injury accidents, which are not included in the table.
Source: Caltrans District 7 TASAS Table B, April 1, 2009 to March 31, 2012.

As shown in Table 3, there are five locations with multiple accidents. The total number of accidents at these five locations is 72.

Table 3: NW SR-138 Accident Locations

Location	Number of Accidents	Most Common Type of Accidents	Most Common Cause of Accidents	Description
PM 1.34 to PM 9.76 (I-5 to 300th St. West)	51	Hit object, sideswipe, head-on	Improper turning, speeding, Driving under the influence	Various
PM 14.52 to PM 14.53 (near 245th St. West)	3	Head-on, hit object, rear end	Speeding	Two fatalities, No pedestrians injured
PM 30.75 (90th St. West intersection)	7	Broadside, rear end, sideswipe	Failure to yield, speeding	No fatalities, no pedestrians injured
PM 33.08 (60th St. West intersection)	7	Broadside	Failure to yield, other vehicle code violations	One fatality, no pedestrians injured
PM 36.80 to PM 36.81 (near SR-138 and SR-14)	4	Broadside, sideswipe	Improper turn	No pedestrians injured

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, June 2015

Within the project corridor, the most common accident type was hit object (42.9%) followed by broadside (17.6%), overturn (13.4%), sideswipe (12.6%) and rear end (9.2%). The primary cause of the accidents on the corridor was improper turning (45.4%) followed by speeding (21.8%) and other violations (14.3%). There were no pedestrians hurt. Proposed improvements such as standard clear recovery zone, 4:1 side slopes, curve corrections, grade-separated interchanges, enhanced channelization at intersections, signalized at-grade intersections, and standard shoulders are expected to lower the rate of the accidents along the project corridor.

- ***Non-Standard Roadway Features-*** The existing roadway is a two-lane conventional highway with non-standard paved shoulders widths, non-standard stopping sight distance around horizontal and vertical curves and near the I-5 connectors, and four structures within the project limits do not meet the minimum vertical clearance standard and many Southern California Edison (SCE) poles adjacent to the existing highway are located within the Clear Recovery Zone (CRZ).

  There are a number of bridges and culvert crossings along the existing highway. Many of those structures were constructed prior to 1970. These facilities should be upgraded to current seismic design criteria and standard horizontal and vertical clearances. The area around the roadway has a drainage area in excess of 500 square miles. The western end of the project has several larger drainage crossings that convey the runoff from the southern mountain slopes northerly and westerly to the dry lake east of SR-14 and north of SR-138. The floodplain in this area is over 2 miles wide and flows to the north of SR-138 west of the SR-14. This large drainage area would require upgrades to existing drainage facilities to meet the current roadway standards for the facility type.

The horizontal and vertical curve on the western end of the project can be corrected to improve sight distance needed for safe stopping distance based on the posted speed limits. The intersection channelization would also help to allow vehicles turning off and onto the roadway to have a refuge area while waiting to cross oncoming traffic. Removal or reducing these types of conflicting movements would be important in all the build alternatives.

Adding standard shoulders to the facility by widening the paved roadway would provide additional width for errant vehicles to recover and would also provide areas for stranded motorists to pull out of moving traffic.

- ***Social Demands/ Economic Development-*** The study area is situated in Antelope Valley in the northwestern region of Los Angeles County. The completion of the Southern Pacific Railroad line in 1876 from San Francisco to Los Angeles spurred the development of many communities, including Lancaster and Palmdale. During World War II, the development of Edwards Air Force Base stimulated the regional economy to transition from an agricultural base to a manufacturing and industrial base while doubling Antelope Valley's population. The aerospace and defense industries expanded substantially in the 1950s, and Palmdale Airport emerged as the national epicenter for jet testing. Toward the end of the 1950s, the economic downturn throughout the entire country slowed military and aerospace investments in Antelope Valley. During the last several decades, new housing opportunities became available as vast acreages were subdivided in order to build affordable tract homes. Lancaster and Palmdale were incorporated as Cities in 1977 and 1962, respectively, and rural communities continued to expand. The remaining areas of Antelope Valley experienced a period of unbalanced growth in regards to housing, employment, and infrastructure investment, while farming recovered as a viable means of employment. Today, a large percentage of Antelope Valley residents commute to their jobs in the Los Angeles basin.

  According to SCAG population and employment estimates and forecasts used in the 2014 Metro Short-Range Transportation Plan, the study area is expected to grow from about 470,700 residents in 2014 to more than 600,000 by 2024, an increase of 28 percent. Employment in the region is expected to grow by 24 percent over the same period. This represents the largest forecasted growth rate of any region in the County, far above the forecasted countywide average growth forecasts of 8 percent (residents) and 5 percent (jobs). While the study area population in 2014 represents 5 percent of total county population, its forecasted growth accounts for 18 percent of total growth projected throughout the County. Table 4 summarizes the changes in population and employments in the cities and in the subregion. According to SCAG forecasts, population and employment growth is anticipated across the study area with concentrated growth in and around Lancaster, Palmdale and the Santa Clarita Valley, and the Quail Lake region near the SR-138/I-5 interchange.

Table 4: Forecasted Population and Growth by Jurisdiction (2014 to 2024)

		2014	2024	Percent Change
Lancaster	Residents	157,700	179,400	14%
	Jobs	47,600	49,700	4%
Palmdale	Residents	147,700	173,000	17%
	Jobs	28,200	32,900	17%
Unincorporated North County	Residents	165,300	250,600	52%
	Jobs	50,000	73,400	47%
Total Study Area	**Residents**	**470,700**	**602,900**	**28%**
	Jobs	**125,800**	**156,000**	**24%**

Source: (Metro 2014 SRTP. Values rounded to nearest hundred.).

Antelope Valley Area Plan

The proposed project is entirely within the Antelope Valley Planning Area of Los Angeles County. The Antelope Valley Area Plan is a comprehensive long-range plan to guide development in the Antelope Valley. The Area Plan is the foundational planning document for the development of the Antelope Valley for the next 20 to 30 years. The Plan was created to achieve the communities' shared vision of the future through specific goals, policies, land use and zoning maps, and other planning instruments. The Plan was adopted on June 16, 2015, and replaces the previously adopted 1986 Antelope Valley Areawide General Plan. The Area Plan's Rural Preservation Strategy addresses issues of Valleywide significance in a manner that builds upon the communities' vision statement. Future growth is projected to focus on job creation to provide a better job and housing relationship and increasing the quality of life for existing and future residents.

Future growth is directed to one of three Economic Opportunity Areas (EOAs):

- West EOA: Intersection of I-5 and SR-138
- Central EOA: Intersection of SR-138 and SR-14, north of William J Fox Airfield
- East EOA: Intersection of SR-14 and the High Desert Corridor

The Antelope Valley offers employment opportunities that exist only in some other select areas in the County such as space technology and alternative energy.

North County Combined Highway Corridors Study

The North County Combined Highway Corridors Study (NCCHCS), completed in 2004, identified SR-138 as a bypass corridor. The NCCHCS recommended expansion of this section of SR-138 to a 6-lane freeway or expressway to accommodate anticipated traffic demands. The NCCHCS projected that traffic demand would at least double by 2025.

SCAG 2012 RTP/SCS Growth Forecast

Antelope Valley as a whole has experienced population, housing and employment growth and decline in the last century and is anticipated to grow at a slower pace through 2035. The growth projections adopted by SCAG (SCAG 2012 Regional Transportation Plan/Sustainable Communities Strategy [RTP/SCS] Growth Forecast, April 2012) indicate increases in both housing and employment within the westernmost portion of the study area.

2013 Integrated Regional Water Management Plan
Growth in the study area would be restricted by several factors. The primary restriction is a diminishing aquifer and water limitations. The Antelope Valley Regional Water Management Group (RWMG) recently released their 2013 Integrated Regional Water Management Plan (IRWMP). The IRWMP states that water supply in Antelope Valley is variable and uncertain and a fundamental challenge is that demand exceeds supply in dry years, which constrains future growth.

Modal Interrelationships and System Linkages- The corridor is unique and very rural in character. As the area grows and experiences more traffic, the diversity in travel demand would change as well. Currently no transit serves this area of the County, but school buses and stops have been identified and are an important part of the community. (Antelope Valley Schools Transportation Agency)

Pedestrians and bicycles use this corridor to varying degrees. In the areas around Antelope Acres, Neenach and at the Pacific Crest Trail, there are locations where bikes and/or pedestrians traverse the roadway.

The regional growth that is anticipated within the corridor is planned on both the western and eastern ends, near I-5 and near SR-14. The potential connection through the widened and improved SR-138 would help link these communities.

The NCCHCS was initiated to develop a multi-modal transportation plan for the northern portion of Los Angeles County that would address both short-term (2010) and long-term (2025) requirements to accommodate a variety of trip purposes and goods movements within the study area. Metro, in collaboration with the County of Los Angeles and the Cities of Lancaster, Los Angeles, Palmdale, and Santa Clarita, completed the study in 2004. The NCCHCS study evaluated three major North County Corridors (I-5, SR-14 and SR-138) to create an integrated major highway and transit investment strategy along the approximately 250 miles of transportation facilities in Northern Los Angeles County.

The NCCHCS recommended improving the portion of SR-138 between the I-5 and SR-14 into a six-lane freeway/expressway. This recommendation was based trends at the time the study was conducted. The region was experiencing high growth rates and the improvement to SR-138 was a response to accommodate the projected population growth and expected substantial increases in goods movement truck traffic.

Metro and Caltrans are also currently studying a new 63-mile High Desert Corridor to the south and east of this portion of SR-138. The High Desert Corridor project would connect SR-14 in the vicinity of Palmdale to SR-138 in San Bernardino County.

The NCCHCS identified the importance of this route for northern Los Angeles County. The route is one of just a few west to east corridors connecting I-5 on the west to SR-14 on the east. This connection links the Central Valley and the Antelope Valley and beyond. When I-5 or SR-14 experience congestion and delays, this alternate route provides a means for regional traffic to bypass the affected congested areas. This is a critical backup route for emergency access when other critical routes are blocked or closed.

Independent Utility and Logical Termini. Federal Highway Administration (FHWA) regulations (23 Code of Federal Regulations [CFR 771.111 (f)] require that this evaluation of the proposed undertaking connects logical termini, and be of sufficient length to address environmental matters on a broad scope. Further, it stipulates that the proposed project have independent utility or independent significance, in that it be usable and require a reasonable expenditure even if no additional transportation improvements in the area are made. Lastly, it stipulates that the proposed project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The proposed project is a stand-alone project intended to improve the operation, safety, capacity, and flow of traffic along the SR-138 corridor. The proposed project begins on the west end at I-5 and end at SR-14 to the east, crossing several established communities in between. The project would address the transportation deficiencies between the two endpoints and future projected congestion affecting the movement of traffic and goods between these routes. The project is a regional-scale transportation corridor that would facilitate multimodal movement, as well as improve traffic continuity.

Table 4 above shows the forecasted growth in population and employment. Those increases, coupled with the declining LOS for the No-Build Alternative in 2040 (LOS E or worse conditions between Gorman Post Road and 300th Street West during peak hours and for all other study segment locations, LOS D or better for SR-138 under the No Build Alternative), signify that changes are needed on the route. The project features have been developed to fully address the purpose and the need of the project and address circulation and multi-modal transportation within the corridor. Based on the above discussion, the project meets the criteria for “logical termini.”

The proposed project is independent of other Caltrans projects and is in no way dependent on the implementation of other Caltrans projects on SR-138 or I-5, prior or subsequent to this proposed undertaking. This environmental document studies the entire project area. If either Build Alternative are selected, the improvements would create a useable facility even if no other transportation improvements are made. Based on the aforementioned, and pursuant to 23 CFR 771.11(f), this project has independent utility and logical termini.

CHAPTER 2 | PROJECT ALTERNATIVES

2.1 PROJECT DESCRIPTION

This section describes the proposed action and the project alternatives that were developed to achieve the identified purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are the No Build Alternative, Alternative 1 (Freeway/Expressway) with or without a design option for a bypass around Antelope Acres, and Alternative 2 (Expressway/ Conventional Highway).

Caltrans, as lead agency under NEPA, as assigned by the Federal Highway Administration (FHWA), and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. The Preferred Alternative would meet the project's Purpose and Need, as discussed in Section 1.2.

Identification of the preferred alternative occurs only after specific effects and reasonable mitigation measures have been identified for each project alternative. The identification is made after all comments are received from the circulation of the draft environmental document for public comment and from the public hearing process. All comments received during the Draft EIR/EIS public review period were considered and responded to. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS was completed.

The proposed project is located in north Los Angeles County on State Route 138 (SR-138) from Interstate 5 (I-5) on the west to State Route 14 (SR-14) on the east and covers a distance of approximately 36.8 miles (Post Mile [PM] 0.0 to PM 36.8). SR-138 is an undivided 2-lane highway that travels around the south side of Quail Lake and east to SR-14. SR-138 is not a controlled-access facility; access and egress points include at-grade intersections with paved and unpaved roads and driveways. The existing roadway consists of two 12-foot lanes with variable shoulders ranging from 2- to 4-foot paved to 8 foot unpaved non-standard shoulders.

The purpose of the project is to improve mobility and operations in northwest Los Angeles County, enhance safety within the SR-138 Corridor based on current and future projected traffic conditions, and accommodate foreseeable increases in travel and goods movement within northern Los Angeles County.

The need for the proposed project is derived from foreseeable increases in travel demand that would exceed the current capacity of SR-138 and higher than average state-wide fatal accident rates at several locations.

Note on Alternatives:
The following terms explain the different transportation facilities that are described in each project alternative. A freeway, as defined by statute, is a highway in respect to which the owners of abutting lands have no right or easement of access to or from their abutting lands or in respect to which such owners have only limited or restricted right or easement of access.

Freeway. A divided arterial highway with full control of access and with grade separations at intersections.
Expressway. An arterial highway with at least partial control of access, which may or may not be divided or have grade separations at intersections.
Conventional Highway. A highway without control of access which may or may not be divided. Grade separations at intersections or access control may be used when justified at spot locations.

2.1.1 NO- BUILD ALTERNATIVE

Implementation of the No-Build Alternative would maintain the existing configuration of SR-138 and would not result in improvements to the route.

The No-Build Alternative would not accommodate the projected population growth or expected substantial increase in goods movement truck traffic in Northern Los Angeles County and the existing corridor would not be improved. Under the No Build Alternative, SR-138 would operate at LOS E or worse conditions between Gorman Post Road and 300th Street West during AM and PM peak hours. For all other study segment locations, SR-138 would operate at LOS D or better under the No Build Alternative. The No-Build Alternative could result in indirect impacts on air quality, mobility, safety, and the economy within Northern Los Angeles County. Due to projected increase in traffic volumes, there is the potential of increased maintenance costs to keep the route operational without any other improvements.

Under NEPA, the No-Build Alternative provides a baseline for comparing the impacts associated with the Build Alternatives. (Under CEQA, existing conditions at the start of environmental studies provide a baseline for environmental impact analysis.)

2.1.2 BUILD ALTERNATIVE 1 | Freeway - Expressway

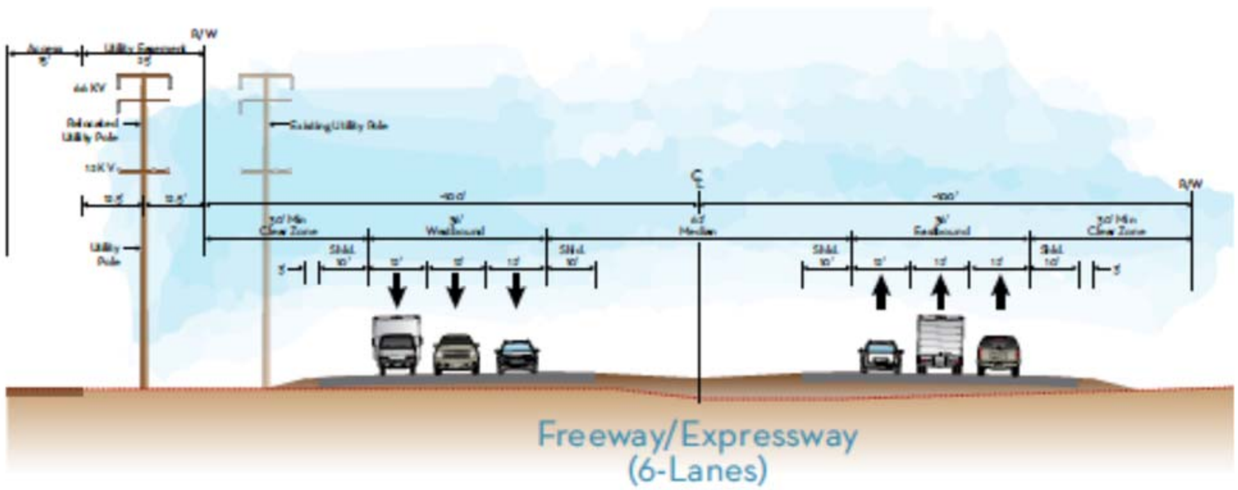
Alternative 1 (Freeway/Expressway) would include a 6-lane freeway from the I-5 interchange to 300th Street West , and a 4-lane expressway from 300th Street West to the SR-14 interchange generally following the existing alignment of SR-138. See Figure 3 and Figure 4 below. Alternative 1 proposes a combination of mainline intersection treatment options included displaced left-turns, restricted crossing median U-turns, roundabouts, and grade separated interchanges. Other intersection treatments, such as jug-handles and signals were considered and were also concluded to be feasible options. The decision on the actual intersection treatment will be determined during the final design phase. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connectors and structure over the SR 14. Study limits on I-5 are from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4. The estimated cost for Build Alternative 1 is $830 million.

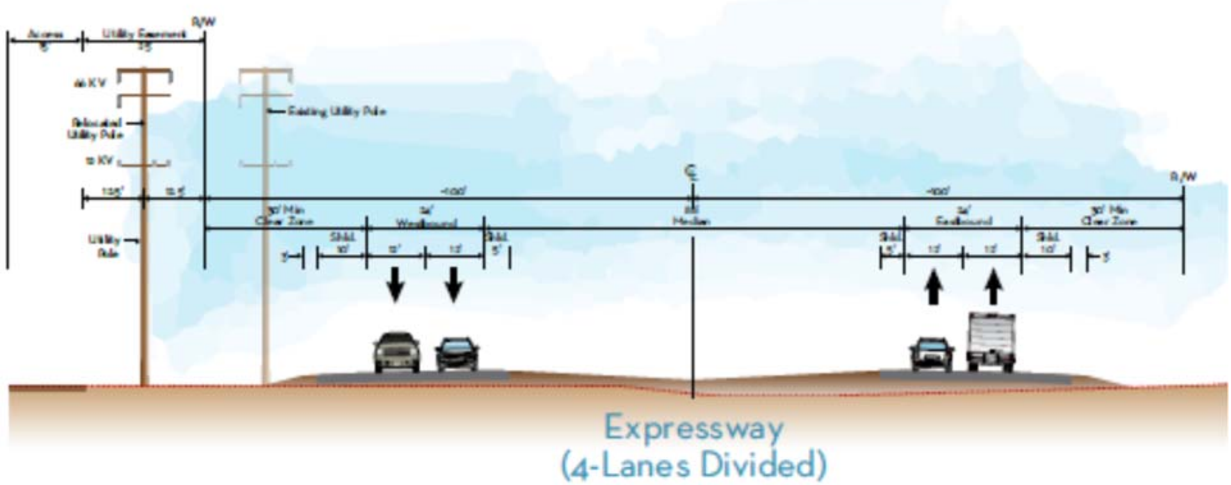
BUILD ALTERNATIVE 1 WITH DESIGN OPTION l Antelope Acres Bypass

Antelope Acres Bypass. There is a design option with this alternative to include a bypass route around the Antelope Acres community. This option was developed for the existing residences of Antelope Acres due to the proposed four-lane expressway along the existing alignment of SR-138. The alignment would bypass the community to the north along West Avenue C and going from west to east, the alignment would begin to deviate from the existing SR-138 near 100th Street West and continue in a northeasterly direction towards West Avenue C. After paralleling West Avenue C for approximately one mile, the alignment would continue in a southeasterly direction back towards the existing SR-138, and eventually join the existing SR-138 near 70th Street West. The existing highway would be relinquished to the County as a local roadway between 100th Street West and 70th Street West to maintain access, with appropriate speed reduction measures proposed to reduce cut-through traffic. Figure 3 depicts Alternative 1 with the bypass option shown in green and white around Antelope Acres. Build Alternative 1 with the Antelope Acres Bypass option would add an additional $9.6 million to the Alternative 1 construction cost.

Figure 3 Build Alternative 1 | Freeway/ Expressway

Figure 4 Typical Cross Sections (Build Alternative 1)





2.1.3 BUILD ALTERNATIVE 2| Expressway – Conventional Highway

Caltrans, as lead agency under NEPA, as assigned by FHWA, and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. Alternative 2 would include a 6-lane freeway from the I-5 interchange connector ramps to Gorman Post Road, a 6-lane expressway from the Gorman Post Road interchange to 300th Street West, a 4-lane expressway from 300th Street West to 240th Street West, and a 4-lane limited access Conventional Highway from 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. Access along the corridor would be provided by at-grade intersections with the exception of a tight diamond interchange at Gorman Post Road. Between Gorman Post Road and SR-14, all existing intersections with major roadways would be modified to restrict access to higher traffic roadways in order to improve safety and operations of the facility. Additional intersection treatment options considered and determined to be feasible include displaced left-turns with median U-turns, roundabouts, and jug-handles. The decision on the actual intersection treatment will be determined during the final design phase. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections and the structure over the SR 14. The study limits on these connectors would be the same as Alternative 1; on I-5 from PM 79.5 to PM 83.1 and on SR -14 the limits are from PM 73.4 to PM 74.4. The estimated project cost for this alternative is $725 million. See Figure 5 and Figure 6 below. Caltrans, as lead agency under NEPA, as assigned by FHWA, and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. The Preferred Alternative would meet the project's Purpose and Need, as discussed in Section 1.2.

Figure 5 Build Alternative 2 | Expressway/ Limited Access Conventional Highway

Figure 6 Typical Cross Sections (Build Alternative 2)

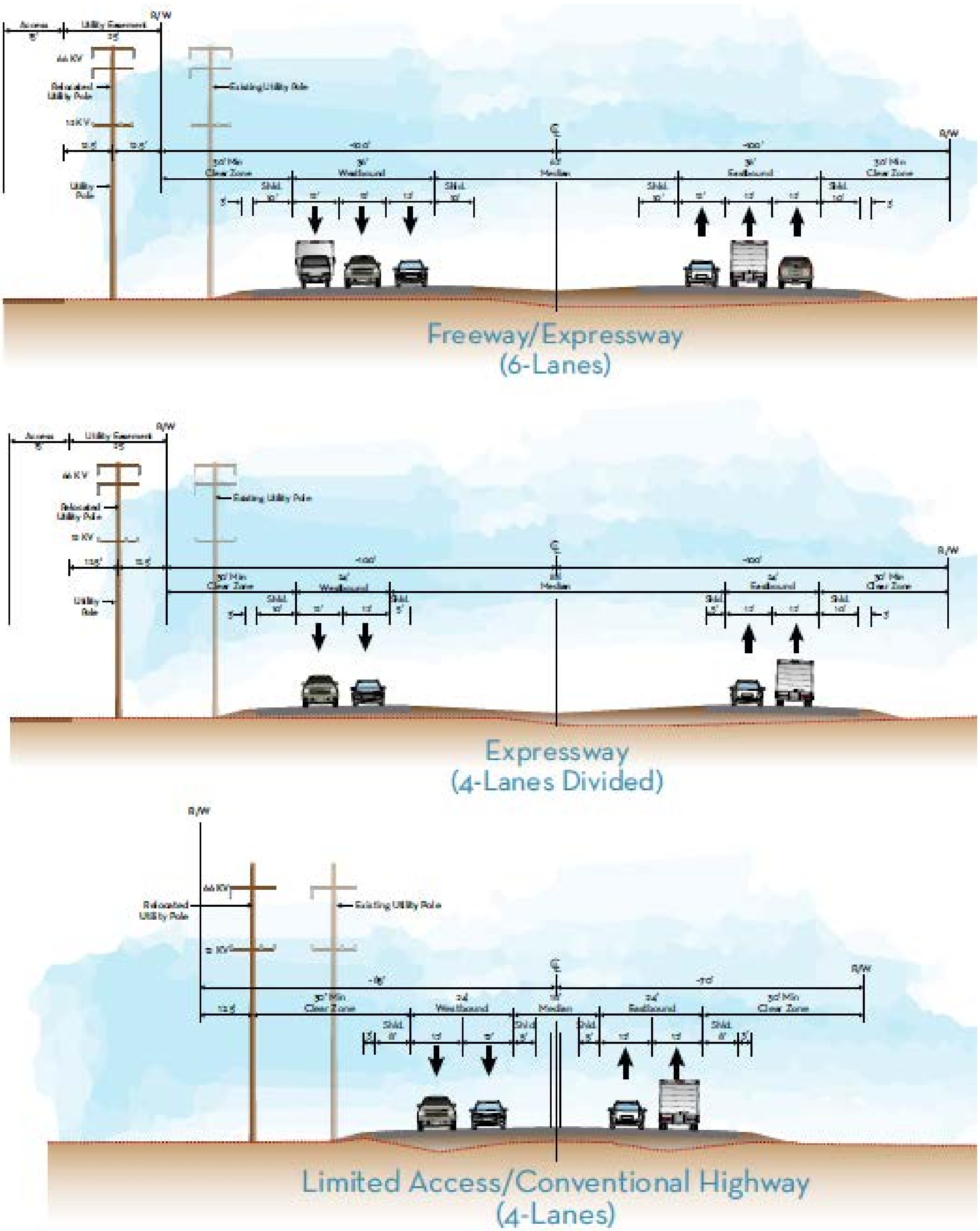


Table 5: Common and Unique Features of the Build Alternatives

Project Feature	Alternative 1 (Freeway/ Expressway)	Alternative 1 with Antelope Acres Bypass Design Option	Alternative 2 (Expressway/ Conventional Highway)
Total right-of-way required (acres)	1,083	1,282	799
I-5 and SR-14 Improvements	• N/B I-5 near the SR-138/ I-5 interchange, add a 1,300-foot deceleration lane prior to the proposed two-lane exit to E/B SR-138. • Add a 1,300-foot deceleration lane from S/B I-5 approaching the SR-138/ I-5 interchange. • Add a 2,500-foot acceleration lane where W/B SR-138 merges with I-5 north. • Add a 3,500-foot acceleration lane where W/B SR-138 merges with I-5 south. • Replace SR-138/SR-14 Separation Structure (Bridge #53-1835) with a wider overcrossing. A profile adjustment to SR-138 over SR-14 and SR-138/ I-5 would provide standard vertical clearance- the ramp alignments would be improved and the ramp termini would be modified.	Same as Alternative 1	Same as Alternative 1
CA Aqueduct	Extension of the existing reinforced concrete box (RCB) culvert at the Quail Lake Outlet into the west branch of the California Aqueduct. Replacement of the bridge at the CA Aqueduct (bridge #53-2047), near 245th Street West. A new parallel structure would be constructed south of the existing bridge.	Same as Alternative 1	Same as Alternative 1
Gorman Creek Bridge	Widen Gorman Creek Bridge (Bridge #53-0085L) to accommodate the proposed acceleration lane on S/B I-5. Concrete lining in Gorman Creek would be modified in coordination with the Department of Water Resources.	Same as Alternative 1	Same as Alternative 1

Project Feature	Alternative 1 (Freeway/ Expressway)	Alternative 1 with Antelope Acres Bypass Design Option	Alternative 2 (Expressway/ Conventional Highway)
Los Angeles Aqueduct	Special treatment would be required at the two Department of Water and Power (DWP) Los Angeles Aqueduct crossings at Three Points Road and 170th Street west. Bridge structures are required to cross over these two relatively shallow large diameter pipes.		
New Interchanges	• New interchange (overcrossing) at Gorman Post Road, • Interchange (undercrossing) at the Cement Plant Road and 300th Street West.	Same as Alternative 1	• New overcrossing at Gorman Post Road, • At-grade signalized intersections at Cement Plant Road and 300th Street West.
New Grade Separated Structures	New grade separation structures (standard Box Culverts) are proposed to accommodate bicycle, recreational use, and maintenance access: • East of Quail Lake near the private airport • West of 290th Street West • At 269th Street West (existing Pacific Crest Trail crossing) • East of Three Points Road at the LADWP Bridge • Two at the California Aqueduct crossing near 245th Street West (one on each side of the crossing). • East of 140th Street West Pedestrian overcrossings have also been evaluated at three locations to facilitate bicycle and pedestrian travel. The recommended locations are near the community of Antelope Acres (75th or 77th Street West), 100th Street West, and near the community of Neenach (280th Street West). These were based on current needs in the corridor and the final decision will be made based on public input, safety, and traffic data at the time the project is built.	Same as Alternative 1	Same as Alternative 1

Project Feature	Alternative 1 (Freeway/ Expressway)	Alternative 1 with Antelope Acres Bypass Design Option	Alternative 2 (Expressway/ Conventional Highway)
Utility Relocations	Southern California Edison, Southern California Gas, AT&T, Verizon, Time Warner, West Valley Water District, Los Angeles Department of Water and Power	Same as Alternative 1	Would include relocation of all the same utilities as Alternative 1 but the number of power poles and length of facilities impacted varies slightly. See Tables 34 and 35 in the Utility section.
Estimated Cost	$830 million	$839 million	$725 million

2.1.3.1 Design Considerations for Build Alternatives 1 & 2

- Use of the existing roadway as a local frontage road in areas where the proposed alignment deviates from the existing alignment to provide local circulation or to maintain current parcel access. The existing highway would be relinquished to the County as a local roadway;

- The existing drainage system along the corridor would be modified and replaced as needed to be compatible with the proposed facility. Cross culverts with sufficient capacity would be installed at various locations to allow for passage of the 100-year storm event without overtopping the roadway;

- Alignment design that reduces impacts to Quail Lake. This includes the elimination of the standard median and use of a barrier to reduce the impacts to a historic property and hillside adjacent to Quail Lake;

- Existing bicycle and pedestrian facilities would be maintained and/or enhanced. The existing bicycle routes south of SR-138 and east of 245th Street West would continue to be utilized. These routes follow parallel County Roads. Between 300th Street West and 245th Street West, bicycle access would be provided by the existing SR-138 roadway which would be replaced by the proposed alignment to the south. Further west, the new access road proposed along the overhead utility corridor between the Cement Plant Road and 300th Street West would accommodate bicycle access. To maintain the continuity of the bike routes within the western project limits, a bicycle path is proposed along the access road between the highway and Quail Lake outside of Caltrans R/W.

- Pedestrian overcrossings are proposed at 3 locations to facilitate pedestrian and bicycle movement through the corridor. The proposed locations are near 75th Street West, 100th Street West, and 280th Street West, and would be fully determined in the Design phase of the project.

- Traffic Management Plans (TMP) would be developed during final design;

- Maintenance vehicle pullout locations would be coordinated with Caltrans Maintenance staff;

- Construction staging would require that one lane of traffic in each direction be open to the public at all times. The anticipated construction staging would allow construction of new lanes adjacent to the existing lanes (either north or south of the existing roadway), allowing traffic to continue to use the existing lanes during construction. Then traffic would be allowed to use the new lanes during the construction of the remaining lanes over the existing roadway;

- Dust control measures would be included during project construction;

- Noise barriers were identified as acoustically feasible at select sensitive noise receptors along the corridor, however, none were determined to be reasonable since the estimated construction cost is higher than the reasonable allowance for each noise barrier. Final decision on which noise barriers would be implemented would be made during the final design phase. See Chapter 4 for CEQA Noise impacts.

Transportation System Management (TSM) and Transportation Demand Management (TDM) Strategies

Transportation System Management (TSM) strategies consist of actions that would increase the efficiency of existing facilities by increasing the number of through trips a facility can carry without increasing the number of through lanes. At this time, the project area does not meet the criteria for the TSM program because the population in the project area is less than 200,000. TSM programs also encourage automobile, public and private transit, ridesharing programs and bicycle and pedestrian improvements.

Transportation Demand Management (TDM) focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled as well as increasing the vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation options in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience, such as ridesharing.

2.1.4 IDENTIFICATION OF PREFFERED ALTERNATIVE

Caltrans, as lead agency under NEPA, as assigned by FHWA, and in cooperation with Metro has identified Alternative 2 (Expressway/Highway) as the Preferred Alternative. The Preferred Alternative would include a 6-lane freeway from the I-5 interchange connector ramps to Gorman Post Road, a 6-lane expressway from the Gorman Post Road interchange to 300th Street West, a 4-lane expressway from 300th Street West to 240th Street West, and a 4-lane limited access Conventional Highway from 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. The Preferred Alternative would meet the project's Purpose and Need, as discussed in Section 1.2. This alternative would improve mobility and operations on SR-138 and in NW Los Angeles County, enhance safety within the SR-138 Corridor based on current and future projected traffic conditions, and accommodate foreseeable increases in travel and goods movement within northern Los Angeles County. In addition to the above, the following sections contains other factors that were considered in the identification of the Preferred Alternative.

Natural Resource Factors

- The Preferred Alternative would result in less impact to Joshua Tree Woodland compared to Alternative 1.

- The Preferred Alternative would result in less impact to Grazing Land, as classified by the California Department of Conservation, compared to Alternative 1.

Community Impact and Local Planning Factors

- The Preferred Alternative is consistent with County of Los Angeles land use and community planning goals, policies and objectives as framed by the Los Angeles County General Plan and Antelope Valley Area Plan as discussed in Section 3.1.1.1, Existing and Future Land Use.

- The Preferred Alternative would result in less impact to Agricultural Land Uses, as designated by the Los Angeles County General Plan and Antelope Valley Area Plan, compared to Alternative 1.

- The Preferred Alternative would result in less displaced residential units compared to Alternative 1 without the Antelope Acres Design Option.

The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, in cooperation with Metro, held two public hearings in August 2016. All comments received during the public review period have been considered. After the Final EIR/EIS is made available, if Caltrans decides to approve the project, a Notice of Determination will be published for compliance with CEQA, and a Record of Decision would be published for compliance with NEPA. If impacts cannot be mitigated below a level of significance, Caltrans will also prepare a Statement of Overriding Considerations.

2.1.5 Alternatives Considered but Eliminated from Further Discussion Prior to Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS)

The following alternatives for the project were withdrawn after consideration by the Project Development Team (PDT). At this time, these alternatives are no longer considered for this project.

The TSM Alternative

The Transportation Management (TSM) Alternative was developed to strategize improvements to the facility without major changes to the overall capacity. This alternative had improvements to the vertical and horizontal roadway alignment in areas that are currently non-standard, shoulder widening, localized improvements at locations with multiple accidents, intersection improvements, and additional lanes to improve safety and traffic flow at focused areas. Upgrades to signage and lighting were also evaluated to improve safety and operations.

The TSM Alternative was proposed originally as a result of agency and public input during circulation of the Notice of Intent (NOI)/Notice of Preparation (NOP) in 2013 and subsequent public meetings. The TSM Alternative was evaluated in the Draft Traffic Study technical report (June 2015). The TSM approach to addressing transportation issues is typically focused on improving State and local transportation systems by increasing the number of peak-hour person-trips without major construction and associated capital expenditures. The TSM Alternative attempts to identify to what degree a transportation need can be satisfied with limited financial resources; therefore, it often functions to set a baseline condition against which the performance of more substantial and costly capital improvement options are measured. TSM strategies are intended to first focus on increasing the efficiency of existing facilities; they are actions that increase the number of vehicle trips a facility can carry without a major expansion of capacity.

The TSM Alternative included minor roadway alignment corrections in areas that are currently non-standard, shoulder widening, localized improvements at locations with multiple accidents, intersection improvements, additional lanes to improve safety and traffic flow at focused areas, and guardrails at some existing utility pole locations. Upgrades to lighting and signage were also a part of this alternative.

This alternative was studied and evaluated in all of the technical studies for the proposed project but the TSM Alternative was not recommended for further analysis in this EIR/EIS and it was ultimately rejected from further study mainly because it did not fully address the project's purpose and need. The rationale behind this decision is summarized below:

1. **Mobility**. The TSM Alternative would only partially address the need for improved mobility within the corridor because vehicular traffic would still travel on a 2-lane highway. Under current conditions, motorists' mobility would be challenged by speed limit changes, traffic signal- and stop-controlled intersections, and direct-access points (e.g., driveways and local roadways) that impede traffic flow.

2. **Level of Service and Congestion**. The TSM Alternative would not adequately address systemic conditions that would contribute to future traffic congestion. Several intersections and roadway segments are forecasted to operate at an unacceptable LOS E or F under the TSM alternative.

3. **Safety**. The TSM Alternative would not address the need for enhanced safety and reliability across the entire corridor. Although the TSM alternative would address current locations with multiple accidents, higher accident rates and similar locations with multiple accidents would develop with increases in average daily traffic without improvements. The TSM alternative would also reduce travel time reliability due to continued forecasted congested traffic operations. As traffic volumes increase without an increase in roadway capacity, trips may divert to local roadways, putting additional pressure on those routes which would increase safety concerns along those routes.

4. **Regional Transportation System Accessibility**. The TSM Alternative would not achieve a high level of accessibility to the regional transportation system because it would rely on the existing limited route across the region.

Six-lane freeway from I-5 to SR-14
Based upon the travel demand forecasts completed as part of this study a six-lane facility is not required east of 300th Street West. This is consistent with what was previously studied and recommended as part of the 2004 NCCHCS Study and subsequent 2008 PSR (PDS). The freeway was also not warranted east of 300th Street West as limiting the access to interchange locations would require interchange construction to provide freeway access along the entire corridor. The impacts and costs for this alignment options were too substantial to consider further.

Alignment North of Quail Lake
Although this option would provide more room to provide the full six-lane divided facility, it had issues with providing similar improvements without substantial impacts to the environment. An alignment study identified major impacts to the Quail Lake drainage shed along the northern portion of the lake, access challenges for properties and the State Department of Water Resources' access to Quail Lake and the California Aqueduct System as well as geometric challenges with placing the roadway adjacent to the Lake and crossing the Aqueduct with a very large, costly structure similar to the one that was built over the aqueduct for the Cement Plant Road. This alternative would have also crossed sensitive habitats and was therefore considered undesirable from an environmental impact standpoint. The impacts and costs for this alignment options were too great to consider further.

Alignment South of Quail Lake
An alternative to move the road further to the south around Quail Lake was considered in an attempt to avoid the historic resource (Kinsey Mansion) immediately adjacent to Quail Lake. This alternative required massive earthwork and impacted the existing hillside just south of the lake. The impacts and costs for this alignment options were too great to consider further.

Alignment along Ridge Route

The Ridge Route is a very physically constrained alignment that goes down a ridge of mountainous terrain to the southeast and has limitations when compared to the current alignment of the existing SR-138. Major earthwork and vertical and horizontal alignment limitations would be needed to provide a similar high capacity alignment alternative. Alignment design exceptions would be required and these would be considered inferior to the existing alignment due to cost, impacts, and ultimate access to the facility.

Median Rail Alternative

The Median Rail Alternative looked at the possibility of including a median wide enough for potential passenger rail service in the SR-138 corridor between I-5 and SR-14. Under Alternative 1 between SR-14 and 300th Street West, the proposed 86-foot median could accommodate future roadway widening or passenger rail service. Between 300th Street West and I-5, a 22-foot median was proposed to avoid major environmental impacts. A wider footprint would impact the West Branch of the California Aqueduct, result in a full take of a historic structure and would require extensive grading along the hillsides south of Quail Lake.

2.1.6 CONSTRUCTION PHASING

Information regarding the phasing of build alternatives is preliminary and dependent on need and funding availability. Construction of either of the build alternatives is estimated to take approximately 3 to 4 years (36 to 48 months) if the project were to be constructed entirely at one time. Should funding not be available to construct the project at one time, a phasing plan would be developed based upon need and availability of funds. It is important to note that funding has not been secured for construction of any of the proposed alternatives. Due to the length (approximately 36 miles) of the project, and due to the need for funding support to be identified, construction of the project may need to be phased, with a construction sequence developed for logically defined segments within the corridor. If a construction phasing plan is developed, a revalidation may be required to account for changes to project impacts. Implementation of some of the TSM Alternative features would be conducive to such a phased approach, given that it includes lower-cost roadway improvements that can be easily packaged into individual construction contracts. Implementation of TSM features that would be compatible with future improvements could work as a first phase of work for either of the Build Alternatives.

Incremental Features

Safety and operational improvements consistent with the elements identified in the TSM Alternative, which has been rejected for further consideration, could be elements included in the early implementation phase of a Build alternative, if selected. The types of improvements that will make up the interim safety improvements include intersection improvements, including turning lanes and acceleration/ deceleration lanes; alignment corrections to the vertical and horizontal alignments to provide improved geometry, including the curve correction at County Road N, the Old Ridge route; and shoulder widening in areas to provide additional width for errant vehicles. The interim safety improvements address the short term needs in the corridor, but fail to meet the purpose and need in the long term for the corridor. TSM elements will be the priority for the near term improvements in the corridor. They are consistent with the implementation and improvements needed in the corridor now and will be incorporated as a priority into the selected alternative implementation plan. To minimize throw-away costs, these incremental features must be designed to be compatible with the ultimate project improvements and right of way limits. For the purpose of air quality analysis and other technical studies, the opening year for the initial phase of the project is assumed to be 2020 and the opening year for the ultimate improvements included for both Alternatives 1 and 2 is assumed to be 2025, subject to funding availability. Additional considerations for project implementation and project phasing would be included in the *Strategic Implementation and Funding Plan*.

2.1.7 COST ESTIMATE

The preliminary estimate of project cost for each build alternative is as follows:

Table 6: Build Alternative Cost Estimates

Category	Alternative 1	Alternative 1 with Antelope Acres Loop	Alternative 2
Roadway	$650.2 million	$650.2 million	$553.7 million
Structures	$24.6 million	$24.6 million	$19.3 million
Right of Way	$101.6 million	$101.6 million	$97.9 million
Capital Outlay	$53.5 million	$62.9 million	$54.1 million
TOTAL	**$830 million**	**$839 million**	**$725 million**

2.1.8 PERMITS AND APPROVALS NEEDED

Table 7: Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Fish and Wildlife Service (USFWS)	Section 7 Consultation for Threatened and Endangered Species, Request a (May Affect, Not Likely to Adversely Affect Concurrence Letter)	Concurrence obtained on January 5, 2017.
United States Army Corps of Engineers (USACE)	Section 404 Nationwide Permit	Application to be submitted and permit to be obtained prior to the Ready-to-List (RTL) date.
California Department of Fish and Wildlife (CDFW)	1602 Agreement 2081 Take Permit	Application to be submitted and permit to be obtained prior to the Ready-to-List (RTL) date.
Regional Water Quality Control Boards (RWQCB) Los Angeles & Lahontan	National Pollutant Discharge Elimination System (NPDES) Permit (includes BMPs)	Applications to be submitted and permits to be obtained prior to the project Ready-to-List (RTL).
California State Water Resources Control Board (SWRCB)	Water Discharge Permit, Water Quality Order (WQO) 2009-0009-DWQ, approval of Notice of Intent (NOI) to comply with General Construction Activity National Pollutant Discharge Elimination System (NPDES) Permit (CWA Section 402), and CWA Section 401 Certification	NOI to be submitted during the design phase.
Los Angeles County	Freeway or Controlled Access Highway Agreement	Would be implemented following project approval.
Department of Water Resources	Review / Approval of Quail Lake Outlet modifications.	An encroachment permit to construct would be required. Improvements would be designed under an encroachment permit application/agreement.
Federal Energy Regulatory Commission (FERC)	Review of EIR/EIS	DWR would coordinate the review of the Draft Environmental Document with FERC as part of their responsibility as owner of the facility.
Federal Highway Administration (FHWA)	Fact Sheet Exceptions to Mandatory Design Standards Draft Financial Plan and Project Management Plan	Coordination in progress, approval must be obtained prior to Project Report approval. Needed prior to Record of Decision (ROD).
State Historic Preservation Office (SHPO)	Finding of Effect and Programmatic Agreement	Finding of Effect concurrence obtained on April 11, 2017. The Programmatic Agreement was executed on June 23, 2017.

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CHAPTER 3 | AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MIMIZATION, AND/OR MITIGATION MEASURES

Environmental Topics Considered but Determined Not to be Relevant

As part of the scoping and environmental analysis carried out for the project, the following environmental issues were considered but no adverse impacts were identified. As a result, there is no further discussion about these issues in this document.

Coastal Zone. The Coastal Zone Management Act of 1972 (CZMA) is the primary federal law enacted to preserve and protect coastal resources. The CZMA sets up a program under which coastal states are encouraged to develop coastal management programs. States with an approved coastal management plan are able to review federal permits and activities to determine if they are consistent with the state's management plan.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. The policies established by the California Coastal Act are similar to those for the CZMA: they include the protection and expansion of public access and recreation; the protection, enhancement, and restoration of environmentally sensitive areas; the protection of agricultural lands; the protection of scenic beauty; and the protection of property and life from coastal hazards. The California Coastal Commission is responsible for implementation and oversight under the California Coastal Act.

The proposed project does not lie within a coastal zone, therefore does not have the potential to adversely affect resources protected by the CZMA of 1972.

Wild and Scenic Rivers. Projects affecting Wild and Scenic Rivers are subject to the National Wild and Scenic Rivers Act (16 United States Code ([USC] 1271) and the California Wild and Scenic Rivers Act (CA Public Resources Code [PRC] Section 5093.50 et seq.).

There are three possible Wild and Scenic Designations:

1. Wild: undeveloped, with river access by trail only.
2. Scenic: undeveloped, with occasional river access by road.
3. Recreational: some development is allowed, with road access.

No Wild and Scenic Designated rivers exist with the project study area, therefore the proposed project does not have the potential to adversely affect resources protected by the National Wild and Scenic Rivers Act (16 United States Code ([USC] 1271) and the California Wild and Scenic Rivers Act (CA Public Resources Code [PRC] Section 5093.50 et seq.).

3.1 HUMAN ENVIRONMENT

3.1.1 LAND USE
3.1.1.1 Existing and Future Land Use
Affected Environment

Project Study Area. The areas within the immediate vicinity of the proposed project would experience the most effects during construction, but would also likely see the most improvement after completion. The project study area covers approximately 36 miles and is roughly bound I-5 to the west (including on/off ramps), SR-14 to the east (including on/off ramps), and 600 feet of study area along the SR-138 alignment (300 feet on each side of the roadway) and the Antelope Acres loop option area. Within the immediate vicinity of the proposed project, predominant land uses are a largely rural, ex-urban settlement and sparsely populated with very low density. Significant Ecological Areas and Agricultural Resource Areas exist along the route that have been designated by the Los Angeles County Department of Regional Planning as RL10 and RL20 land use.

The study area is comprised of the small unincorporated towns and communities that are directly adjacent to the project area in Northwestern Los Angeles County. They are: Gorman, Neenach/ Oso, and Antelope Acres. These communities fall within Census tracts 9009 and 9012.09 respectively (Figure 7). In addition, Lancaster and Palmdale are larger metropolitan areas just south of the eastern project limits within the Antelope Valley. Town councils which represent the communities within or near the project limits are described below:

<u>**Antelope Acres**</u>
The Antelope Acres community boundaries are Avenue A and 60th Street West to Avenue E, Avenue E at 70th Street West to Avenue J, Avenue J to 110th Street West to Lancaster Road, Lancaster Road to 170th Street West, and 170th St. West to Avenue A .

Based on the Antelope Valley Area Plan, commercial and industrial uses are only allowed in the rural town center along 90th St West between Ave E-4 and Ave E-12. This specific area is designated by Los Angeles County Regional Planning as a Rural Commercial (CR) Zone "to serve the daily needs of residents and provide local employment opportunities" and acts as a focal point for the community.

<u>**Fairmont**</u>
The community of Fairmont is located in the northwestern portion of Antelope Valley-west of Antelope Acres and near the Antelope Valley California Poppy Reserve. The Fairmont community is largely undeveloped and has very few infrastructure and public facilities. The neighborhood is a rural preserve area with single-family homes on large lots allowing light/heavy agriculture, equestrian and animal keeping activities and has land use designations of RL10 and RL20 by the Los Angeles County Department of Regional Planning. There is no rural town center area, and no commercial or industrial land use designations.

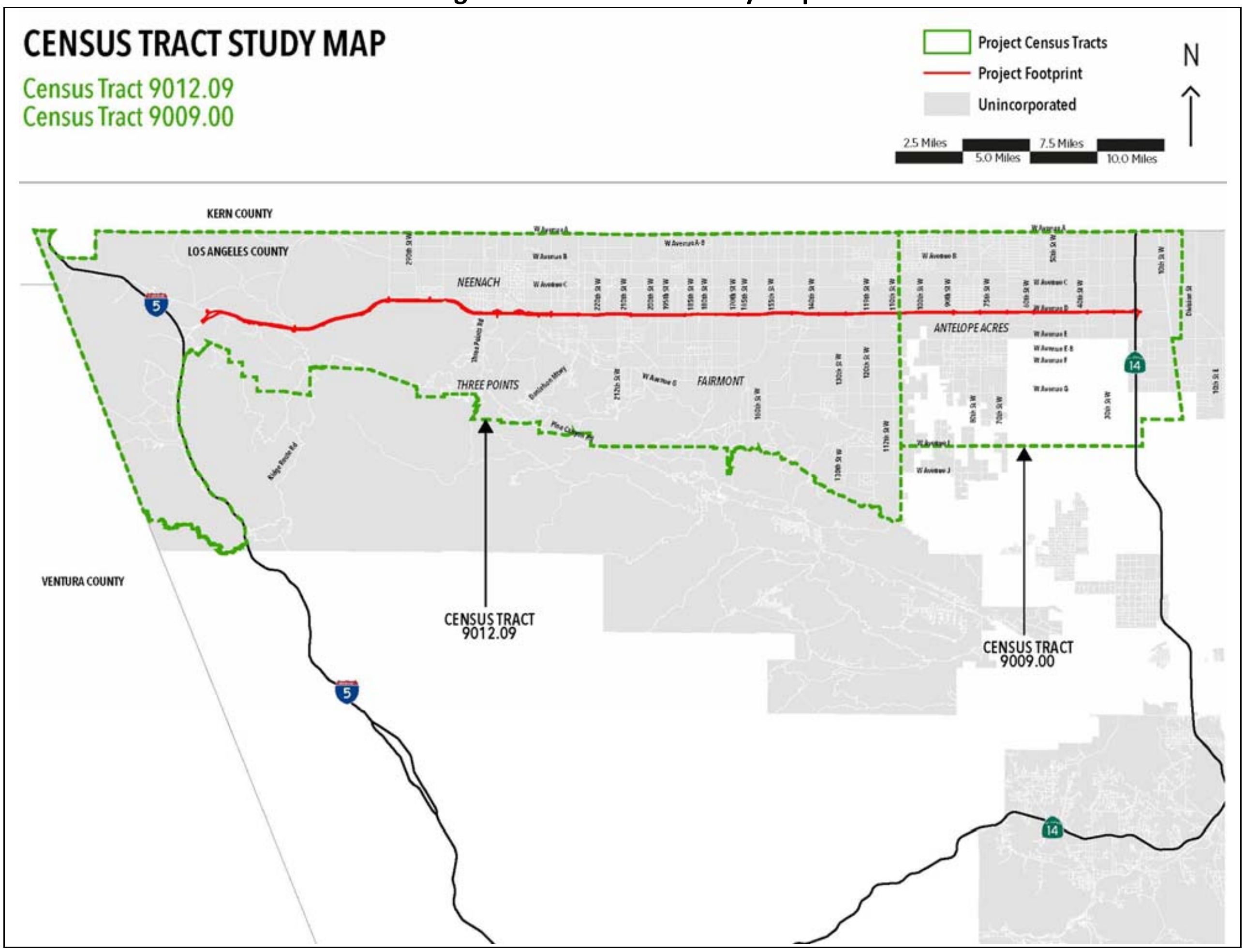
<u>**Neenach / Oso**</u>
The town of Neenach is located along Ave D (SR-138) in the far western portion of Antelope Valley. Its rural town areas are defined by the following: Ave B to the north, 270th St W and 260th St W to the west, Ave D to the south, and 250th St W on the east. There is partial development in these areas which consist of single family homes on large lots with light agricultural uses. Heavy agriculture is prohibited,

while home-based businesses are allowed in the area so as long as they meet the Los Angeles County Department of Regional Planning's Zoning Code requirements.

Three Points

The town of Three Points is located south of Neenach and northwest of Lake Hughes in the far west portion of Antelope Valley next to the Angeles National Forest. Similar to its surrounding neighbors, the vast majority of the community is undeveloped. The town consists of single-family homes on large lots with some agricultural uses. Los Angeles County designates the community area as a rural preserve, Rural Land 20 (RL20), except for one parcel located on southwest corner of Three Points Road and Pine Canyon Road which is listed as Rural Commercial (CR).

Figure 7 Census Tract Study Map



Development Trends in the Project Area

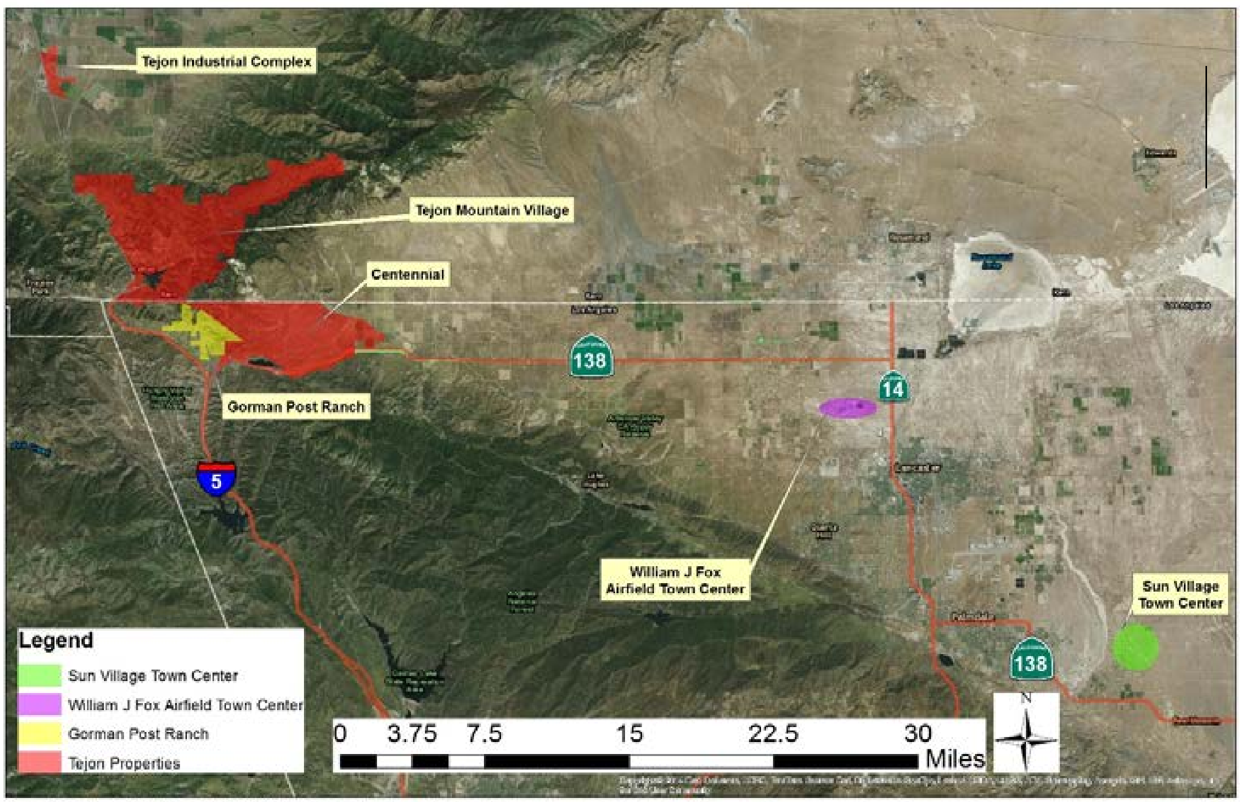
Table 8 and Figure 8 display the development projects located near the project vicinity:

Table 8: Development Trends

Name	Jurisdiction	Proposed Uses	Status
Tejon Ranch Commerce Center	Tejon Ranch property / Kern County	1,450 acre commercial / industrial center	Partially Completed
Tejon Mountain Village	Tejon Ranch property / Southern Kern County	3,400 estate homes, hotels, condominiums and golf courses	Planned
Centennial Specific Plan	Los Angeles County	19,333 new residences, approximately 8.4 million square feet of commercial and industrial space on 12,323 acre site	Planned

Source: Caltrans, Community Impact Analysis, December 2016

Figure 8 Planned Development in the Project Vicinity



Source: Caltrans, Community Impact Analysis, December 2016

3.1.1.2 Consistency with State, Regional, and Local Plans and Programs

Several land use plans and transportation policies are applicable within the study area for the proposed project. This section provides an analysis of the project build alternatives in relation to the transportation and land use and polices included in the general federal, state and regional planning documents.

Affected Environment

Federal Transportation Improvement Program (FTIP)

The Federal Transportation Improvement Program (FTIP) is a capital listing of all transportation projects proposed over a six-year period for the Southern California Association of Governments region. The Southern California Association of Governments (SCAG) is the Metropolitan Planning Organization for Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial Counties. Projects included on the FTIP include, but not limited to, highway improvements, transit, rail and bus facilities, high occupancy vehicle lanes, signal synchronization, intersection improvements, and freeway ramps in the SCAG region, and a biennial FTIP update is produced on an even-year cycle. The project is also in the 2017 Federal Transportation Improvement Program (FTIP), which was found to be conforming by the FHWA/FTA on December 16, 2016 (Project ID: LA0G949*; Complete PA&ED to determine the alternatives for the approximate 36.8-mile east-west SR-138 highway facility between I-5 and SR-14 in northern Los Angeles County. The PA&ED will study and determine the alternatives (i.e., freeway and/or expressway), constraints (right-of-way requirements), potential impacts/improvements and conduct technical studies)*.

Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

The SCAG is mandated by the federal government to develop regional plans for transportation, growth management, hazardous waste management, and air quality. The 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) (SCAG 2012) is a comprehensive 20-year transportation plan that provides a vision for the future of the multimodal transportation system in the SCAG region and how that vision can be achieved. The 2012 RTP/SCS priorities for transportation planning within the Southern California region, sets goals and policies, and identifies performance measures for transportation improvement to ensure that future projects are consistent with other planning goals for the area. The 2012 financially constrained RTP/SCS, was found to conform to the SIP by SCAG on April 4, 2012, and by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) on June 5, 2012.

On April 7, 2016, SCAG's Regional Council adopted the 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS). The FHWA and FTA approved the 2016 RTP/SCS on June 1, 2016. The 2016 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental and public health goals. The Plan charts a course for closely integrating land use and transportation – so that the region can grow smartly and sustainably. Projects being constructed within the SCAG region must be listed in the RTP/SCS.

The goals shown in Table 9 were adopted by SCAG in the 2012 RTP/SCS and 2016 RTP/SCS are relevant to the proposed project:

Table 9 Consistency Determination for Relevant 2012 and 2016 RTP/SCS Goals

1	**Goal 2:** Maximize mobility and accessibility for all people and goods in the region.
	Consistent: The proposed project would provide a substantial long-term benefit to the region by improving west-east mobility and addressing present and future travel demand needs. Other long-term benefits of the proposed project are listed in Section 1.2, Project Purpose. As an improved transportation facility, the NW SR-138 Corridor Improvement Project is an integral component of long-range planning for the northern region of Los Angeles. Together, routes I-5, SR-14, and SR-138 provide a link to other state routes and interstate roadways that are used by trucks transporting goods beyond the local area; therefore, providing an improved route would allow more efficient goods movement in and beyond the immediate NW SR-138 Corridor vicinity.
2	**Goal 3:** Ensure travel safety and reliability for all people and goods in the region.
	Consistent: Any of the build alternatives along the NW SR- 138 Corridor should help improve the regional economy. Updating highway geometrics and safety features to current highway design standards should help facilitate safe and efficient movement of people and goods. It would increase Antelope Valley's accessibility to neighboring metropolitan regions via Interstate 5. Providing operational and safety improvement such as improving sight distances and bringing non-standard roadway features up to standard will help accommodate future demand, emergency access and improve connection to residential and business properties along the corridor.
3	**Goal 4:** Preserve and ensure a sustainable regional transportation system.
	Consistent: The project is a regional-scale transportation corridor that would facilitate multimodal movement, as well as improve traffic continuity. The regional growth that is anticipated within the corridor is planned on both the western and eastern ends, near I-5 and near SR-14. The potential connection through the widened and improved SR-138 would help link these communities. The route is one of just a few west to east corridors connecting I-5 on the west to SR-14 on the east. This connection links the Central Valley and the Antelope Valley and beyond. When I-5 or SR-14 experience congestion and delays, this alternate route provides a means for regional traffic to bypass the affected congested areas. This is a critical backup route for emergency access when other critical routes are blocked or closed.
4	**Goal 5:** Maximize the productivity of our transportation system.
	Consistent: The proposed project would provide a substantial long-term benefit to the region by improving west-east mobility and addressing present and future travel demand needs. Other long-term benefits of the proposed project are listed in Section 1.2, Project Purpose. As an improved transportation facility, the NW SR-138 Corridor Improvement Project is an integral component of long-range planning for the northern region of Los Angeles.
5	**Goal 6:** Protect the environment and health of residents by improving air quality and encouraging active transportation (non-motorized transportation such as bicycling and walking).
	Consistent: On December 2, 2014, the Transportation Conformity Working Group (TCWG) determined that the project is not a project of air quality concern. Per the transportation conformity rules and regulations, all nonexempt projects must go through review by the TCWG. This project was approved and concurred upon by Interagency Consultation at the TCWG meeting as a project not having air quality concern for particulate matters, and it meets the requirements of the CAA and 40 CFR 93.116. Also, the proposed project is consistent with the scope of the design concept of the FTIP. Therefore, the proposed project is in conformance with the State Implementation Plan (SIP). To accommodate bicycle access across the proposed SR-138 right of way, seven new standard box culverts are proposed, including one east of Quail Lake near the Quail Lake Skypark, one east of 300th Street West, one at 269th Street West (existing Pacific Crest Trail crossing), one east of Three Points Road, two at the California Aqueduct crossing near 245th Street West (one on each side of the canal to provide access along the levee roads), and one east of 140th Street West. Full standard widths will be used for all proposed structures. In addition, new overcrossings will be considered at various intersections with local roads including 60th Street West, 90th Street West, 110th Street West, 170th Street West, 190th Street West, 210th Street West, and 3 points Road to enhance traffic safety and improve local vehicular, pedestrian and bicycle circulation. To maintain the continuity of the bike routes within the western project limits, a bicycle path is proposed along the access road between the highway and Quail Lake outside of Caltrans R/W. Also, specific improvements include a

	Class I bike path, which will be established by utilizing the proposed utility corridor and remnant portions of the existing SR-138. Other improvements include pedestrian and bike refuge areas, cross-walks, and median cutthroughs for bikes. The project would improve existing pedestrian routes and create new pedestrian routes. Pedestrian overcrossings are proposed at 3 locations to facilitate pedestrian and bicycle movement through the corridor. The proposed locations are near 75th Street West, 100th Street West, and 280th Street West, and would be fully determined in the Design phase of the project.

The Federal Clean Air Act requires all states to develop a general plan to attain and maintain the National Ambient Air Quality Standards (NAAQS) as well as a specific plan to attain the NAAQS for each area designated nonattainment for an NAAQS. These plans, known as State Implementation Plans (SIPs), are developed by state and local air quality management agencies and submitted to the United States Environmental Protection Agency (EPA) for approval. The SCAG 2012 RTP/SCS describes improvements to SR-138 between I-5 and SR-14, by adding two mixed-flow lanes in each direction (project ID# S1120072). Alternatives 1 and 2 propose two additional lanes in each direction between Gorman Post Road and 300th Street West, and one additional lane in each direction between 300th Street West and SR-14. The 2012 financially constrained RTP/SCS, was found to conform to the SIP by SCAG on April 4, 2012, and by the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) on June 5, 2012. The project is in the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016 (RTP ID: 1122004; *Northwest 138 Corridor Improvement Project – approximately 36 miles, providing an improved 4 to 6 lane facility between I-5 and SR 14*).

Los Angeles County General Plan

The Los Angeles County General Plan is the guide for long-term physical development and conservation through a framework of goals, policies, and implementation programs. It also provides the policy framework for how and where the unincorporated areas will grow through the year 2035, establishing the goals, policies, and programs to foster healthy, livable, and sustainable communities. In all, the Los Angeles County General plan guides growth countywide through goals, policies, and programs that discourage sprawling development patterns; protect areas with hazard, environment and resource constraints; encourage infill development in areas near transit, services and existing infrastructure; and make a strong commitment to ensuring sufficient services and infrastructure. It also lays the foundation for future community-based planning initiatives that will identify additional opportunities for accommodating growth, and the development of plans that respond to the unique and diverse character of local communities.

The Los Angeles County General Plan identifies 11 planning areas. The proposed project is entirely within the Antelope Valley Planning Area of Los Angeles County. The Antelope Valley Area Plan is a comprehensive long-range plan to guide development in the Antelope Valley. The Area Plan is the foundational planning document for the development of the Antelope Valley for the next 20 to 30 years. The Plan was created to achieve the communities' shared vision of the future through specific goals, policies, land use and zoning maps, and other planning instruments. The Plan was adopted on June 16, 2015, and replaces the previously adopted 1986 Antelope Valley Areawide General Plan. The Area Plan's Rural Preservation Strategy addresses issues of Valleywide significance in a manner that builds upon the communities' vision statement.

Through the planning and visioning process, the County identified issues of Valleywide significance that, it determined, were best addressed in a comprehensive and coordinated manner. In anticipation of future growth, the planning effort focused on ways to manage this growth and addressed the need for balance on the following issues:

1. Preservation and enhancement of each unique town's rural character, allowing for continued growth and development without compromising the rural lifestyle;

2. Preservation of open space around existing towns, in order to preserve hillside areas and significant ridgelines, conserve biological resources, provide opportunities for recreation, and make more efficient use of existing infrastructure in the core areas;

3. Planning for integrated circulation systems, including bikeways, walkways, and multi-purpose trails;

4. Conservation of significant resources, including agricultural lands, mineral resources, water supply, and scenic areas;

5. Preservation of public health, safety, and welfare, through identification of natural and environmental hazards, including noise, seismic, fire, and airborne emissions, and designation of land uses in an appropriate manner to mitigate these impacts; and

6. Coordination on enhancing public and community services such as law enforcement, fire protection, and parks.

The Antelope Valley Area Plan puts forth various policies in support of the proposed project. The policies in support of the proposed project include the following:

<u>Policy M 5.1</u>: Support development of the High Desert Corridor and the Northwest 138 Corridor Improvement Project, to provide a route for truck traffic between Interstate 5, State Route 14, and Interstate 15.

<u>Policy M 6.3</u>: Support the development of the High Desert Corridor and the Northwest 138 Corridor Improvement Project between Interstate 5, State Route 14, and Interstate 15, and encourage the participation of private enterprise and capital.

<u>Policy ED 1.4</u>: Support the development of the High Desert Corridor and the Northwest 138 Corridor Improvement projects to improve the east-west movement of goods, particularly between the Antelope Valley and the industrial areas of Kern and San Bernardino counties and beyond.

<u>Policy ED 1.6</u>: Support the development of a range of travel options that better connect the Antelope Valley to existing regional trade and employment in other regions, including the High Desert Corridor and the Northwest 138 Corridor Improvement Projects.

<u>Policy ED 1.20</u>: Support the development of a range of travel options that better connect the Antelope Valley to existing regional trade and employment centers in other regions, including the High Desert

Corridor and the Northwest 138 Corridor Improvement Project, as directed in the policies of the Mobility Element.

All other relevant policies, along with an evaluation of the project's consistency with the policies, are presented below.

Table 10 Consistency Determination for Relevant Antelope Valley Area Plan Goals and Policies

G1	**Goal LU 5:** A land use pattern that decreases greenhouse gas emissions.
P1	**Policy LU 5.1:** Ensure that development is consistent with the Sustainable Communities Strategy adopted in 2012, an element of the Regional Transportation Plan developed by the Southern California Association of Governments.
	Consistent: The SCAG Regional Transportation Plan (RTP) Sustainable Communities Strategy (SCS) 2012-2035 describes improvements to SR-138 between I-5 and SR-14 by adding two mixed-flow lanes in each direction (project ID# S1120072). Alternatives 1 and 2 propose two additional lanes in each direction between Gorman Post Road and 300th Street West and one additional lanes in each direction between 300th Street West and SR-14.
G2	**Goal M 2:** Reduction of vehicle trips and emissions through effective management of travel demand, transportation systems, and parking.
P2	**Policy M 2.4:** Develop multi-modal transportation systems that offer alternatives to automobile travel by implementing the policies regarding regional transportation, local transit, bicycle routes, trails, and pedestrian access contained in this Mobility Element.
	Consistent: To accommodate bicycle access across the proposed SR-138 right of way, seven new standard box culverts are proposed under Alternative 1, including one east of Quail Lake near the Quail Lake Skypark, one east of 300th Street West, one at 269th Street West (existing Pacific Crest Trail crossing), one east of Three Points Road, two at the California Aqueduct crossing near 245th Street West (one on each side of the canal to provide access along the levee roads), and one east of 140th Street West. Full standard widths will be used for all proposed structures. Alternative 2 proposes the same structures as those under Alternative 1 with the exception of the undercrossing structures at Cement Plant Road and 300th Street West, where at-grade signalized intersections are proposed instead of grade-separated interchanges. In addition, new overcrossings will be considered at various intersections with local roads including 60th Street West, 90th Street West, 110th Street West, 170th Street West, 190th Street West, 210th Street West, and 3 points Road to enhance traffic safety and improve local vehicular, pedestrian and bicycle circulation. To maintain the continuity of the bike routes within the western project limits, a bicycle path is proposed along the access road between the highway and Quail Lake outside of Caltrans R/W. Also, specific improvements include a Class I bike path, which will be established by utilizing the proposed utility corridor and remnant portions of the existing SR-138. Other improvements include pedestrian and bike refuge areas, cross-walks, and median cutthroughs for bikes.
G3	**Goal M 3:** An efficient network of major, secondary, and limited secondary highways to serve the Antelope Valley.
P3	**Policy M 3.1:** Implement the adopted Highway Plan for the Antelope Valley, in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis through financing programs, such as grants, congestion pricing, bonding, fair share cost assignments, etc.

	Consistent: The adopted Highway Plan shows the SR-138 as a Proposed Expressway within the project limits.
P4	**Policy M 3.3:** Implement highway improvements only when necessitated by increasing traffic or new development or for safety reasons.
	Consistent: The need for the project is based on an assessment of the existing and future transportation demand in the project area compared to the existing capacity of the facility. The improvements included in the alternatives were developed based on the approved land use plan by Los Angeles County and as defined in the Southern California Association of Governments (SCAG) forecast traffic volumes for the 2040 horizon year. The improvements will not be needed until the traffic increases and the traffic increases are based on how quickly the land use buildout occurs. As new locations are considered for development, Los Angeles County as the approving agency will need to determine future improvements that are required to meet the access locations agreed to with this project and provide for local circulation for property access as a condition of approval. It is anticipated that the early improvements in the corridor will focus on safety and operations and will not include capacity improvements. As the traffic increases in the corridor, the capacity improvements will be implemented, as funding is available. A Draft Freeway Agreement has been prepared that will be executed between Caltrans and Los Angeles County to agree to these future intersection locations. The types of intersection control will be determined as warranted by needs and timing. The locations will not change, the types of control will be determined based on the conditions that warrant the improvements.
P5	**Policy M 3.6:** Engage local communities and agencies in the planning and implementation of transportation improvements.
	Consistent: Caltrans and Metro have initiated an outreach program that has included a number of meetings with elected officials, town councils, stakeholders, and the community at large. The public has been kept apprised of the status of the project and provided input through the scoping process. A Notice of Preparation (NOP) and Notice of Intent (NOI) were issued in November 2013. Two scoping meetings were held in March 2014 and four Cooperating and Participating agency meetings were held between March 2014 and June 2015. In May 2015, two open houses were held to update the public and other interested stakeholders on the proposed project, and to provide information on the Alternatives. In addition, briefings and project update meetings were held with elected officials, resource agencies, and homeowner associations in the project area to present project updates and receive feedback. The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, in cooperation with Metro, held two public hearings in August 2016. All comments received during the public review period have been considered. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS was completed. After the Final EIR/EIS is made available, if Caltrans decides to approve the project, a Notice of Determination will be published for compliance with CEQA, and a Record of Decision would be published for compliance with NEPA.
G4	**Goal M 9:** A unified and well-maintained bicycle transportation system throughout the Antelope Valley with safe and convenient routes for commuting, recreation, and daily travel.
P6	**Policy M 9.1:** Implement the adopted Bikeway Plan for the Antelope Valley in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis.
	Consistent: The Los Angeles County Bicycle Master Plan map does not identify existing or proposed bike trails along SR-138. However, the Bicycle Master Plan does identify several proposed north-south and east-west Class III Bike Trails within Antelope Valley just south of SR-138. Within the immediate project area, a proposed Class III Bike Route would run north-south along Ridge Route Road, connecting SR-138 and Ridge Route Road at Quail Lake. The new proposed alignment would also provide further continuity with the bike

	trails and provide cyclists access to new County trails within Antelope Valley in the region south of SR-138. Specific improvement include a Class I bike path, which will be established by utilizing the proposed utility corridor and remnant portions of the existing SR-138. Other improvements include pedestrian and bike refuge areas, cross-walks, and median cut-throughs for bikes.
P7	**Policy M 9.3:** Ensure that bikeways and bicycle routes connect communities and offer alternative travel modes within communities.
	Consistent: Pedestrian overcrossings help reduce the distance that pedestrians and bicyclists need to travel between proposed crossings. Since a significant part of the corridor is currently rural and undeveloped, the three potential pedestrian overcrossings considered are in the communities of Antelope Acres and Neenach, serving current pedestrian needs. The three locations include 75th Street West or 77th Street West, 100th Street West, and 280th Street West. Community input from the High Desert Cyclists also indicated that 60th Street West and 90th Street West are used as the primary routes for north-south movements across SR-138. Intersection treatment options such as signalized intersections, roundabouts, and vehicular overcrossings provide an improved bicycle crossing at these two locations. To accommodate bicycle access across the proposed SR-138 right of way, seven new standard box culverts are proposed under Alternative 1, including one east of Quail Lake near the Quail Lake Skypark, one east of 300th Street West, one at 269th Street West (existing Pacific Crest Trail crossing), one east of Three Points Road, two at the California Aqueduct crossing near 245th Street West (one on each side of the canal to provide access along the levee roads), and one east of 140th Street West. Full standard widths will be used for all proposed structures. Alternative 2 proposes the same structures as those under Alternative 1 with the exception of the undercrossing structures at Cement Plant Road and 300th Street West, where at-grade signalized intersections are proposed instead of grade-separated interchanges. In addition, new overcrossings will be considered at various intersections with local roads including 60th Street West, 90th Street West, 110th Street West, 170th Street West, 190th Street West, 210th Street West, and 3 points Road to enhance traffic safety and improve local vehicular, pedestrian and bicycle circulation.
G5	**Goal M 10:** A unified and well-maintained multi-use (equestrian, hiking, and mountain bicycling) trail system that links destinations such as rural town centers and recreation areas throughout the Antelope Valley.
P8	**Policy M 10.1**: Implement the adopted Trails Plan for the Antelope Valley in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis.
	Consistent: The project area includes a trail network that is used by hikers, bicyclists, and equestrians. This network is comprised of the Adopted County Backbone Trail System, Pacific Crest National Trail, Federal/National Forest Trails, and Incorporated City Trails. Hiking trails would be maintained and/or enhanced with the SR-138 corridor project.
G6	**Goal M 11:** A continuous, integrated system of safe and attractive pedestrian routes linking residents to rural town center areas, schools, services, transit, parks, and open space areas.
P9	**Policy M 11.1:** Improve existing pedestrian routes and create new pedestrian routes, where appropriate and feasible. If paving is deemed necessary, require permeable paving consistent with rural community character instead of concrete sidewalks.
	Consistent: The project would improve existing pedestrian routes and create new pedestrian routes. Pedestrian overcrossings are proposed at 3 locations to facilitate pedestrian and bicycle movement through the corridor. The proposed locations are near 75th Street West, 100th Street West, and 280th Street West, and would be fully determined in the Design phase of the project.

	Pedestrian overcrossings help reduce the distance that pedestrians need to travel between proposed crossings. Since a significant part of the corridor is currently rural and undeveloped, the three potential pedestrian overcrossings proposed are in the communities of Antelope Acres and Neenach, serving current pedestrian needs. Diverting motorized and non-motorized modes of traffic to grade separated crossing points or signalized intersections may enhance safety for pedestrians.
G7	**Goal COS 3:** A clean water supply untainted by natural and man-made pollutants and contaminants.
P10	**Policy COS 3.5:** Protect underground water supplies by enforcing controls on sources of pollutants.
	Consistent: The project would include BMPs to reduce pollutants of concern in runoff from the project area, and the proposed storm drain system would be sized to accommodate the build-out of the project.
G8	**Goal COS 4:** Sensitive habitats and species are protected to promote biodiversity.
P11	**Policy COS 4.4:** Require new development in Significant Ecological Areas, to consider the following in design of the project, to the greatest extent feasible:
P11(a)	o Preservation of biologically valuable habitats, species, wildlife corridors and linkages;
	Consistent: There are approximately 72 existing cross culverts within the project limits. Approximately 47 existing cross culverts will be maintained or expanded. Approximately 25 cross culverts will be abandoned and an additional 93 cross culverts will be constructed to maintain hydrologic integrity and support wildlife movement. Culverts will range in size from 24 inches to 10 ft. by 10 ft. in width and height, and ranging from 80 ft. to 200 ft. in length and vary between reinforced concrete pipes, reinforced concrete boxes, and corrugated metal pipes. Caltrans has identified areas where mitigation is feasible and these areas will be studied further based on final design. Caltrans has also identified effective avoidance and minimization measures in section 3.3.1 Natural Communities. Once final design is obtained, Caltrans shall perform additional studies and plan for additional wildlife crossings to maximize wildlife movement. Requiring fencing, adequate size of the crossings for animal type, and location based on adequate open space is the priority for effective wildlife permeability.
P11(b)	o Maintenance of watershed connectivity by capturing, treating, retaining and/or infiltrating storm water flows on site;
	Consistent: Storm Water Treatment Best Management Practices (BMPs) would be incorporated into the project to mitigate the impacts to water quality because of the proposed increase in impervious areas within the project limits. Given the high to moderate infiltration rates anticipated in native soils and the flat terrain, infiltration trench appears to be an ideal treatment BMP option for the project.
P12	**Policy COS 4.6:** Encourage connections between natural open space areas to allow for wildlife movement.
	Consistent: There are approximately 72 existing cross culverts within the project limits. Approximately 47 existing cross culverts will be maintained or expanded. Approximately 25 cross culverts will be abandoned and an additional 93 cross culverts will be constructed to maintain hydrologic integrity and support wildlife movement. Culverts will range in size from 24 inches to 10 ft. by 10 ft. in width and height, and ranging from 80 ft. to 200 ft. in length and vary between reinforced concrete pipes, reinforced concrete boxes, and corrugated metal pipes. Caltrans has identified areas where mitigation is feasible and these areas will be

	studied further based on final design. Caltrans has also identified effective avoidance and minimization measures in section 3.3.1 Natural Communities. Once final design is obtained, Caltrans shall perform additional studies and plan for additional wildlife crossings to maximize wildlife movement. Requiring fencing, adequate size of the crossings for animal type, and location based on adequate open space is the priority for effective wildlife permeability.
P13	**Policy COS 4.8:** Ensure ongoing habitat preservation by coordinating with the California Department of Fish and Game to obtain the latest information regarding threatened and endangered species.
	Consistent: There are approximately 72 existing cross culverts within the project limits. Approximately 47 existing cross culverts will be maintained or expanded. Approximately 25 cross culverts will be abandoned and an additional 93 cross culverts will be constructed to maintain hydrologic integrity and support wildlife movement. Culverts will range in size from 24 inches to 10 ft. by 10 ft. in width and height, and ranging from 80 ft. to 200 ft. in length and vary between reinforced concrete pipes, reinforced concrete boxes, and corrugated metal pipes. A detailed wildlife passage impact assessment shall be conducted during the final design phase to confirm the proposed culverts for wildlife passage will be effective with consideration to current land use, approved projects within the area, and further coordination with CDFW and USFWS.
G9	**Goal COS 9:** Improved air quality in the Antelope Valley.
P14	**Policy COS 9.2:** Develop multi-modal transportation systems that offer alternatives to automobile travel to reduce the number of vehicle trips, including regional transportation, local transit, bicycle routes, trails, and pedestrian networks, as directed in the policies of the Mobility Element.
	Consistent: The NCCHCS was initiated to develop a multi-modal transportation plan for the northern portion of Los Angeles County that would address both short-term (2010) and long-term (2025) requirements to accommodate a variety of trip purposes and goods movements within the study area. Metro, in collaboration with the County of Los Angeles and the Cities of Lancaster, Los Angeles, Palmdale, and Santa Clarita, completed the study in 2004. The NCCHCS study evaluated three major North County Corridors (I-5, SR-14 and SR-138) to create an integrated major highway and transit investment strategy along the approximately 250 miles of transportation facilities in Northern Los Angeles County. The NCCHCS recommended improving the portion of SR-138 between the I-5 and SR-14 into a six-lane freeway/expressway.
P15	**Policy COS 9.7:** Encourage reforestation and the planting of trees to sequester greenhouse gas emissions.
	Consistent: Large trees and shrubs marked for removal will be replaced in kind with native trees and shrubs.
G10	**Goal COS 11:** Energy systems for use in public facilities that reduce consumption of non-renewable resources while maintaining public safety.
P16	**Policy COS 11.2:** Promote the use of solar-powered lighting for highways, streets, and public facilities, including parks and trails.
	Consistent: Intersection Safety Lighting will be included as required and the use of Solar Powered lighting will be considered for enhanced sustainability, and in compliance with Caltrans Lighting Standards.
P17	**Policy COS 15.1:** Ensure that outdoor lighting, including street lighting, is provided at the lowest possible level while maintaining safety.
P18	**Policy COS 15.4:** Require compliance with the provisions of the Rural Outdoor Lighting District throughout the unincorporated Antelope Valley.
	Consistent: The project's lighting design will be consistent with Caltrans and County lighting guidelines and standards and would be developed in coordination with Caltrans Landscape Architecture staff for areas within state right-of-way as well as with County staff. To preserve the dark night sky as a natural resource in

	the desert region communities, dark-sky compliant lighting should be selected to minimize light pollution cast into the sky while maximizing light cast onto the ground, as appropriate. A lighting plan shall be developed that requires project lighting to be appropriately shielded.
P19	**Policy COS 16.2:** Maximize the use of native vegetation in landscaped areas, provided that vegetation meets all applicable requirements of the Fire Department and the Department of Public Works.
	Consistent: Native vegetation would be planted to replace the vegetation removed or affected by construction activity. Also, the vegetation would be consistent with the character of the adjacent community landscape.
P20	**Policy COS 17.6:** Require new landscaping to comply with applicable water efficiency requirements in the County Code.
	Consistent: The highway planting concept for the corridor focuses on replanting of disturbed areas with native plant species and community to the extent feasible. Specific plant choices will be made during PS&E. Any proposed plants should not require irrigation after plant establishment. Additionally, development of a new water supply connection with the local water or irrigation district should not be needed. Highway planting features include non-irrigated hydroseed mix, rock blankets, decomposed granite, aesthetic treatments, and visual landmarks at major intersections.
P21	**Policy COS 17.9:** Require reduction, reuse, and recycling of construction and demolition debris.
	Consistent: Measures taken to conserve resources include potential recycling of existing asphalt concrete on-site for reuse as subgrade. This measure would be further investigated during the final design phase along with other potential ways to conserve resources including reuse of existing rail, steel, and lumber wherever possible, such as for falsework, shoring, and other applications during the construction process.
G11	**Goal COS 18:** Permanently preserved open space areas throughout the Antelope Valley.
P22	**Policy COS 18.1:** Encourage government agencies and conservancies to acquire mitigation lands in the following areas and preserve them as permanent open space: - Significant Ecological Areas, including Joshua Tree Woodlands, wildlife corridors, and other sensitive habitat areas:
	Consistent: During the final design phase of the project, an onsite mitigation feasibility analysis shall be conducted. If it is deemed that on-site relocation of individuals or on-site plantings within Caltrans ROW are not possible after construction is complete, off-site mitigation shall be conducted within the region and shall preserved in perpetuity. Efforts will be made to acquire Joshua tree woodland within LA County's Joshua Tree Woodland SEA. If on-site relocation of individuals or on-site plantings within Caltrans ROW are not possible for riparian habitat after construction is complete, off-site mitigation shall be completed and shall be coordinated with CDFW, USACE, and SWRCB DWQ. Efforts will be made to acquire riparian habitat within LA County's San Andreas Rift Zone SEA.
P23	**Policy PS 2.4:** Ensure that new development does not cause or contribute to slope instability.
	Consistent: Measures from the Preliminary Geotechnical Design Report prepared for the project would be implemented to minimize surficial instability and erosion for cut slopes with a gradient of 2H:1V:.

Environmental Consequences

<u>No Build Alternative</u>

Implementation of the No-Build Alternative would maintain the existing configuration of SR-138 and would not result in improvements to SR-138. This alternative would potentially be inconsistent with regional plans and programs such as the 2016 RTP/SCS and 2017 FTIP since the project would not be constructed as approved in the Regional Transportation Plan for the area.

The No-Build Alternative would not accommodate the projected population growth or expected substantial increase in goods movement truck traffic in Northern Los Angeles County and the existing corridor would not be improved. As discussed in the Project Study Report/ Project Development Study (PSR/PDS), the existing SR-138 corridor is projected to degrade and operate consistently at a Level of Service (LOS) E and F for 2040 conditions (Caltrans, 2008). The No-Build Alternative could result in indirect impacts on air quality, mobility, safety, and the economy within Northern Los Angeles County.

Build Alternatives 1 & 2

The build alternatives are consistent with state, regional, and local plans and programs and/or will be consistent with the incorporation of the proper avoidance, minimization and/or mitigation measure. Relevant goals and policies have been considered and it was found that the goals, objectives, and policies of the plans and programs discussed earlier in this section promote improvement in the transportation infrastructure, improve traffic circulation, accommodate many modes of transportation, improve air quality, support economic growth, accommodate existing and future residents, as well as businesses, and other similar goals and policies.

The existing SR-138 facility is a two-lane rural highway with non-standard features, unpaved shoulders, and limited sight distance in some areas. The route contributes to the local circulation network and provides an alternate route for east-west traffic in northwest Los Angeles County. To avoid the congestion of the Los Angeles metropolitan area, this route is being increasingly used as an alternate for recreation vehicles and heavy trucks coming from the north and going to Las Vegas, Barstow, Victorville, San Bernardino County, and Riverside County. The NW SR-138 Corridor Improvement Project would upgrade SR-138 and provide operational and safety improvements.

The need for the project is based on an assessment of the future transportation demands, existing capacity of the facility, historic accident data, existing non-standard roadway features, present and future social demands, and forecasted economic development. Providing operational and safety improvement such as improving sight distances and bringing non-standard roadway features up to standard will help accommodate future demand, emergency access and improve connection to residential and business properties along the corridor.

Due to the nature of the built environment and surrounding land uses, the north-south roadways connecting to SR-138 do not have sidewalks, and bicycle facilities are limited. The County of Los Angeles Bicycle Plan and a Trails Plan identifying existing and future planned facilities throughout the County were adopted into the Antelope Valley General Plan. The project area also includes a trail network that is used by hikers, bicyclists, and equestrians. This network is comprised of the Adopted County Backbone Trail System, Pacific Crest National Trail, Federal/National Forest Trails, and Incorporated City Trails. Several bicycle and pedestrian facilities as well as hiking trails will be maintained and/or enhanced with the SR-138 corridor project. Specific improvement include a Class I bike path, which will be established by utilizing the proposed utility corridor and remnant portions of the existing SR-138. Other improvements include pedestrian and bike refuge areas, cross-walks, and median cut-throughs for bikes. Pedestrian overcrossings that help facilitate safe pedestrian and bicycle travel across the corridor have also been considered at three locations and deemed to be feasible.

Reduction in congestion from this project contributes to the overall reduction in GHG emissions in the region, as demonstrated in the Southern California Association of Governments Regional Transportation Plan. An assessment of the greenhouse gas emissions and climate changes is included in section 4.4 (Climate Change).

On December 2, 2014, the Transportation Conformity Working Group (TCWG) determined that the project is not a project of air quality concern. An updated PM hot-spot analysis has been submitted to the TCWG for their review on July 28, 2015. Per the transportation conformity rules and regulations, all nonexempt projects must go through review by the TCWG. This project was approved and concurred upon by Interagency Consultation at the TCWG meeting as a project not having adverse impacts on air quality, and it meets the requirements of the CAA and 40 CFR 93.116. Also, the proposed project is consistent with the scope of the design concept of the FTIP. Therefore, the proposed project is in conformance with the State Implementation Plan (SIP), and is determined to be in local conformity.

Avoidance, Minimization, and Mitigation Measures
LU-1: Engage local communities and agencies in the planning and implementation of transportation improvements.

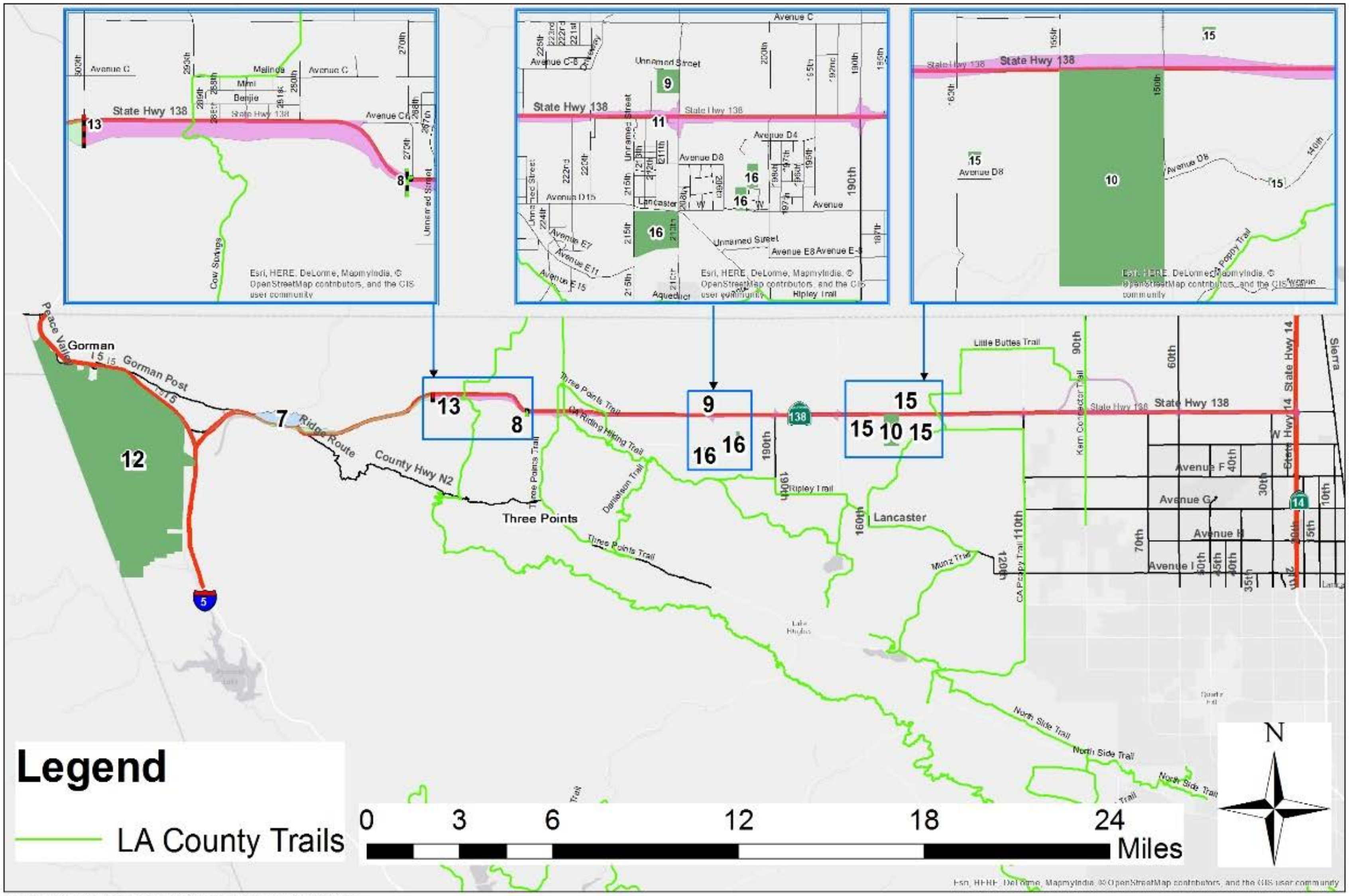
3.1.1.3 Parks and Recreation

Affected Environment
Table 11 and Figure 9 provide parks and recreational facilities within approximately 0.5 mile of the project vicinity, including equestrian trails, recreational bikeways, and other recreational trails in this section of the document. None of these facilities are protected by the Park Preservation Act.

Table 11: Parks and recreational facilities within ½ mile of the project limits

Reference # on Map	Name of Property	Type of Property
7	Quail Lake	Recreation
8	Existing Pacific Crest Trail	Recreation
12	Hungry Valley Off Road Vehicle Recreation Area (west of I-5 and SR-138 junction)	Recreation
13	Proposed relocation of Pacific Crest Trail to 300th Street West and SR-138	Recreation
No Reference # (shown as solid green lines on map)	Various trails that intersect SR-138 @ Three Points Road; 300th Street West east of Three Points Road; 245th Street West and California Aqueduct; 90th Street West; East of 140th Street West along the power line. These trails are County adopted planned trails and may already have existing recreational uses.	Recreation

Figure 9 Parks and recreational facilities within ½ mile of the project limits



Document Path: C:\Users\s138754\Documents\SR-138 NW4-F Map.mxd

Source: Caltrans Section 4(f) Analysis

Environmental Consequences

Temporary Impacts

Typical roadway construction activities would result in some temporary, localized impacts such as additional truck traffic, pollutant emissions from construction activities, and increased noise and vibration. Potential construction impacts would be temporary and intermittent, and would not be considered adverse. For more details on the project's potential to impact and park or recreational facilities, please see the Section 4(f) Analysis in Appendix B.

Permanent Impacts

The "No-Build" alternative would not impact parks and recreational facilities. For both Alternatives 1 and 2, no permanent impacts to parks or recreational facilities are expected. Although the Hungry Valley Off Road Vehicle Recreation Area qualifies as a Section 4(f) resource, there would be no "use" in relation to Section 4(f); see Appendix B for more information.

Avoidance, Minimization, and Mitigation Measures

The project would not have a substantial impact on any parks or recreational facilities. The following measure is included to keep those nominal impacts to a minimum.

PARKS- 1: Project construction BMPs would be employed to minimize dust and manage storm water runoff.

PARKS-2: Avoid impacts to the two Section 4(f) park/ recreation facilities; See Appendix B for more information. (Parcels # 3236001900 and # 3238027900).

3.1.2 GROWTH

Regulatory Setting

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, require evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a requirement to examine indirect effects, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…" Caltrans guidance for preparers of growth related studies was used in the development of this section of the document.

Affected Environment

The study area for the growth impacts discussion is defined by the census tract blocks that encompass or are adjacent to the SR-138 corridor within the project limits. This study area extends beyond the physical boundaries of the proposed Build Alternative improvements to include a diverse mix of land uses and communities that may be affected by the project. The study area is comprised of the small unincorporated towns and communities in Northwestern Los Angeles County. Unincorporated areas in the Antelope Valley are primarily undeveloped, except near Lancaster and Palmdale and in a few scattered communities. Rural residential communities include Antelope Acres, Fairmont, Gorman, Neenach, Oso, and Three Points. These areas include commercial, agricultural and other nonresidential uses but primarily contain parcels that are residential or undeveloped.

Existing and Planned Growth

Antelope Valley as a whole has experienced population, housing and employment growth and decline in the last century and is anticipated to grow at a slower pace through 2035. The growth projections adopted by SCAG (SCAG 2012 Regional Transportation Plan/Sustainable Communities Strategy [RTP/SCS] Growth Forecast, April 2012) indicate increases in both housing and employment within the westernmost portion of the study area. The 2012-2035 RTP/SCS includes goals, policies and performance indicators, identifies specific projects, programs and implementation, and includes a description of regional growth trends that identify future needs for travel and goods movement. The 2012-2035 RTP/SCS contains transportation and urban form strategies that encourage compact growth, jobs/housing balance and transit-oriented development, where feasible, in all parts of the region. The Final Program Environmental Impact Report (PEIR) for the 2012-2035 RTP/SCS covers overall impacts of all transportation projects and land development described in the 2012-2035 RTP/SCS. The PEIR analyzed the growth and cumulative effects of the growth in the Northwest Antelope Valley. The Final PEIR for the 2012-2035 RTP/SCS was certified by the SCAG Regional Council at its April 4, 2012 meeting. The PEIR is incorporated by reference in this Final EIR/EIS.

On April 7, 2016, SCAG's Regional Council adopted the 2016-2040 Sustainable Communities Strategy (2016 RTP/SCS). The 2016 RTP/SCS is a long-range visioning plan that balances future mobility and housing needs with economic, environmental and public health goals. The Plan charts a course for closely integrating land use and transportation – so that the region can grow smartly and sustainably. After a review of the land use assumptions in the 2016 model, it was observed that the land uses developed for the 2012 model for the SR-138 and the Antelope Valley Area Plan (AVAP) have not significantly changed. Additionally, key corridor volumes were compared between the models and there not significant differences in these volumes.

The central and eastern portion of the study area is projected to have little to no growth. As of 2012, the Bureau of Labor Statistics reported 3,977,297 persons employed in the County of Los Angeles in addition to 10.9 percent unemployment.[1] In Antelope Valley, there are 148,817 persons employed in the civilian labor force, and 12.2 percent unemployment.[2] Antelope Valley has a higher unemployment rate than the County. Future growth is projected to focus on job creation to provide a better job and housing relationship and increasing the quality of life for existing and future residents. Antelope Valley offers employment opportunities that do not exist elsewhere in the County such as space technology and alternative energy. Improvements in this corridor were anticipated in the SCAG 2012 RTP (RTP ID S1120072). Therefore, the improvements are considered to have been planned in conjunction with forecasted changes in demographic characteristics.

The proposed project is entirely within the Antelope Valley Planning Area of Los Angeles County. The Antelope Valley Area Plan is a comprehensive long-range plan to guide development in the Antelope Valley. The Area Plan is the foundational planning document for the development of the Antelope

[1] Bureau of Labor Statistics, 2012

[2] United States Census: *5-Year American Community Survey* (2008 – 2012 Estimate)

Valley for the next 20 to 30 years. The Plan was created to achieve the communities' shared vision of the future through specific goals, policies, land use and zoning maps, and other planning instruments. The Plan was adopted on June 16, 2015, and replaces the previously adopted 1986 Antelope Valley Areawide General Plan. The EIR prepared for the Plan analyzed the growth and cumulative effects of the growth in the Northwest Antelope Valley. Specifically, the Plan's EIR focused on impacts from changes to land use associated with buildout of the proposed land use maps and impacts from overall population and employment growth in the project area. The Los Angeles County Board of Supervisors held a public hearing on the proposed Antelope Valley Area Plan and its appurtenant Final Environmental Impact Report on Wednesday, November 12, 2014. The Board unanimously indicated its intent to approve the Area Plan Update and certify its Final EIR. The EIR is incorporated by reference in this Final EIR/EIS.

The Area Plan's Rural Preservation Strategy addresses issues of Valleywide significance in a manner that builds upon the communities' vision statement. The Rural Preservation Strategy is based on four types of environments. Collectively, these environments preserve the rural character of the region, conserve environmental resources, and protect residents from potential hazards while allowing for additional growth and development.

The Rural Preservation Strategy includes 1) Rural Preserve Areas, where residential densities would be reduced from the previous Area Plan in order to protect important ecological and agricultural resources as well as minimize development in very high hazard areas; 2) Rural Town Areas, where maximum residential densities and minimum lot sizes would be established to preserve rural character; 3) Rural Town Centers, where urban commercial uses would be discouraged; and 4) Economic Opportunity Areas (EOA), where future growth development should be focused, and where future planning may be needed. These policies protect important ecological and agricultural resources and preserve rural character, while accommodating new housing and employment opportunities in appropriate areas of the Antelope Valley.

<u>Development Trends</u>
Development projects are proposed within the Western EOA and Central EOA, both of which are within the study area. Within the Western EOA, the Centennial Specific Plan and Project is a master-planned new town that would located near the I-5 and SR-138 junction, surrounding the north and east sides of Quail Lake. The project is located both in unincorporated Los Angeles and Kern Counties. The Specific Plan and Project propose a maximum of 19,333 dwelling units and approximately 8.4 million square feet of commercial and industrial space, new schools, parks, fire stations and a sheriff's station on the 12,323 acre (19.3 square mile) site. The site, bisected by the Calironia Aqueduct, is currently undeveloped, containing some grazing and crop lands. Centennial, originally proposed to the County in 2002, is still in its preliminary stages and has not yet received any approval or entitlements.

Within the Central EOA, the Fox Field Industrial Center is a master-planned industrial complex in the City of Lancaster. The Fox Field Industrial Corridor Specific Plan was approved in 1996. The Fox Field Industrial Corridor Specific Plan area is generally located west of SR-14, between Avenue E and Avenue H. The Specific Plan addresses land uses for an 8,200-acre site with a focus on two planning areas, Fox Field East and Fox Field West. The specific plan provides for a variety of land uses including manufacturing, light industrial, office, research and development, supporting commercial uses and open space. The Fox Field Industrial Corridor Specific Plan would allow development up to an estimated 9.7 million square feet of developable space in Fox Field East and Fox Field West (phases 1 through 4) and

81.7 million square feet in the expansion areas. As of April 2006, approximately 1,973,698 square feet of commercial and industrial space has been constructed within the Specific Plan area and approximately 220,000 square feet of space has been constructed within the new state fairgrounds. Since then, major distribution and support centers have been constructed for Rite Aid drug stores (750,000 square feet), Michaels arts and crafts suppliers (738,000 square feet), and the Sygma Network (200,000 square feet).

Growth Constraints

Growth in the study area would be restricted by several factors. The primary restriction is a diminishing aquifer and water limitations. The Antelope Valley Regional Water Management Group (RWMG) 2013 Integrated Regional Water Management Plan (IRWMP) states that water supply in Antelope Valley is variable and uncertain and a fundamental challenge is that demand exceeds supply in dry years, which constrains future growth.

The majority of the study area falls under the Rural Preserve Area designation. Rural Preserve Areas are designated as Rural Land with a range of very low densities that reflect the underlying constraints, environmental resources, and safety hazards. These areas are largely undeveloped and generally not served by existing or planned infrastructure and public facilities. According to the Antelope Valley Area Plan, residents of Rural Preserve Areas should be prepared to forego additional infrastructure in order to live in a very remote rural environment and enjoy the benefits offered by such an environment. The Rural Preserve Area designation would serve to constrain development in much of the study area.

Environmental Consequences

The nature of a development project can be described as tending toward growth inducement or growth accommodation; the former being a project that creates potential for further development where it is not planned, and the latter being a project that is planned as a response to existing or foreseeable demands of the community served. This distinction generally explains the intent and purpose of a proposed project. The proposed project is intended to accommodate planned growth.

The Build Alternatives have been compared to assess their ability to meet the defined purposes of the proposed project related to improving mobility and operations in northwest Los Angeles County, as well as accommodating foreseeable increases in travel and goods movement within northern Los Angeles County.

Alternative 1 (Freeway/Expressway) and Alternative 1 with Antelope Acres Bypass would include a six-lane freeway from the I-5 interchange connector ramps to 300th Street West, and a four-lane expressway from 300th Street West to the SR-14 interchange generally following the existing alignment of SR-138 except for the implementation of a loop roadway around Antelope Acres to reduce the impacts to the community. The existing roadway would be used as a local frontage road to provide local circulation or to maintain current parcel access. The existing highway would be relinquished to the County as a local roadway in these areas.

Along the corridor, a combination of grade separation and at-grade access locations would be provided between I-5 and SR-14 as part of Alternative 1. This alternative would propose a grade-separated interchange near the current Gorman Post Road intersection on SR-138 to provide access to Department of Water Resource (DWR) facilities and private properties in this area. Grade-separated interchanges area also proposed at Cement Plant Road and 300th Street West. To the east until SR-14, there are a number of existing at-grade intersection with local roadways throughout. These intersections would be modified to operate in a free-flow configuration, such as displaced left turns, median U-turns, jug-handle and right-in-right-out. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections.

Alternative 2 (Expressway and Four-Lane Conventional Highway) would include a six-lane freeway from the I-5 interchange connector ramps to Gorman Post Road, a six-lane expressway from the Gorman Post Road interchange to 300th Street West, a four-lane expressway from 300th Street West to 240th Street West, and a limited access Conventional Highway from 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138. Access along the corridor would be provided by at-grade intersections with the exception of a tight diamond interchange at Gorman Post Road. Between Gorman Post Road and SR-14, all existing intersections with major roadways would be modified to restrict access to higher traffic roadways in order to improve safety and operations of the facility. Additional intersection treatment options considered and determined to be feasible include displaced left-turns with median U-turns, roundabouts, and jug-handles. There would also be improvements to the I-5/SR-138 and SR-138/SR-14 freeway connections.

Under both alternatives, existing intersections would be improved and consolidated where appropriate to improve the access and operations of the facility. Also, operational improvements under these alternatives, such as improving site distances and bringing non-standard roadway features to standard, would help accommodate future demand, emergency access and improve connections to residential and business property located along the corridor.

SR-138 would operate at LOS A or B at all study segment locations due to the additional lane capacity provided under both of these alternatives in the opening year. The capacity improvements would meet the near-term increase in travel demand along the corridor and improve operations from LOS C and D in the western portion of the corridor to LOS A or B, and from LOS B to C in the central and eastern portions of the corridor to LOS A or B. Traffic volumes would not be expected to increase under 2040 condition for these alternatives.

Currently, SR-138 is not a controlled-access facility; access and egress point include at-grade intersections with paved and unpaved roads and driveways. Based on the operational and capacity improvements, Alternatives 1 and 2 would potentially change accessibility in the study area. Improving mobility, accessibility, and safety has the potential to enhance the attractiveness of the area for additional economic and residential development.

While highway improvements in general have the ability to enhance accessibility within local communities, both build alternatives would generally follow the existing alignment of SR-138 and would not accommodate new access points to and/or from the study area that would result in growth pressures in areas where such access does not presently exist. As a result, the project would not provide access to areas previously inaccessible or improve access in ways that would foster local development beyond that which is already planned, and would not affect the rate, amount, or type of growth envisioned in the Antelope Valley Area Plan.

Growth in the study area would be based largely on market conditions. The project would not change any existing constraints to growth and there would not be any construciton impacts associated with growth. With or without the project, residential growth within the regional area would continue to be limited by natural resource constraints (e.g., water availability/supply), as well as geographic and regulatory factors (e.g., Rural Preserve Areas) that would guide future development to rural town center areas, rural town areas and economic opportunity areas. The proposed project would have a negligible degree of influence on regional growth. Because the project is not expected to influence growth substantially, it would not put pressure on or cause growth-related indirect impacts to environmental resources of concern.

Avoidance, Minimization, and Mitigation Measures
No avoidance, minimization and/or mitigation measures are proposed as the project is not anticipated to have an extensive influence on regional growth. There would not be growth-related indirect impacts to environmental resources of concern.

3.1.3 FARMLANDS/ TIMBERLANDS

Regulatory Setting
The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 United States Code [USC] 4201-4209; and its regulations, 7 Code of the Federal Regulations [CFR] Part 658) require federal agencies, such as the Federal Highway Administration (FHWA), to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

The California Environmental Quality Act (CEQA) requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses.

Affected Environment
Based on the 2012 U.S. Department of Agriculture (USDA) Census of Agriculture, Los Angeles County had 1,294 farms totaling 91,689 acres (average of 71 acres) in 2012. The California Farmland Mapping and Monitoring (FMMP) 2012 data shown in Table 12 indicate the presence of 35,333 acres of Important Farmland in Los Angeles County. Most of the Important Farmland in Los Angeles County is concentrated near the project limits. The NW SR- 138 Corridor Project mostly traverses grazing land across rural areas in the northwestern portion of Los Angeles County. Between 2012 and 2010, Los Angeles County suffered a net loss of Important Farmland. Table 13 indicates that the net acreage for each land use category had changed. During this period, population growth and associated urban development drove the loss of Important Farmland; however, losses also can occur if land is used for habitat conservation or confined animal facilities. Gains in Important Farmland can also occur, for example, when grazing land is converted to crop production.

Prime Farmland and Farmland of Statewide Importance are located in the project area as identified in the FMMP. Prime Farmland is defined as farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Farmland of Statewide Importance is similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Grazing land consists of existing vegetation that is suitable for livestock grazing. This particular category was developed in cooperation with the California Cattlemen's Association, the

University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The proposed project mostly traverses grazing land across rural areas in the Antelope Valley.

Environmental Consequences

No-Build Alternative

No construction activities would occur under this alternative. As a result, it would neither convert agricultural land, nor would it result in changes to existing land use in the study area. Consequently, this alternative would not result in farmland impacts.

Build Alternatives

Projects where farmland may be adversely affected require close coordination with the NRCS, and completion of a Farmland Conversion Impact Rating Form. The rating form provides a basis for assessing the extent of farmland impacts relative to federally established criteria. The rating form is based on a Land Evaluation and Site Assessment (LESA) system, which is a numerical system that measures the quality of farmland. The table below shows the amount of farmland and grazing land that would be converted under each alternative.

Table 12: Farmland Conversion (Acres)

Farmland Type (Source: California Department of Conservation)	Alternative 1	Alternative 1 with Antelope Acres Bypass	Alternative 2
	Permanent Impacts (Acres)	Permanent Impacts (Acres)	Permanent Impacts (Acres)
Prime and Unique Farmland	0.75	1.5	0.75
Statewide and Local Important Farmland	21.5	21.5	21.5
Grazing Land	1104	1121	184

Source: Caltrans, Community Impact Analysis, December 2016
U.S. Department of Agriculture, National Resources Conservation Service, Farmland Conversion Impact Rating for Corridor Type Project Form

Table 13: Los Angeles County Summary and Change by Land Use Category

LAND USE CATEGORY	TOTAL ACREAGE INVENTORIED		2010-12 ACREAGE CHANGES			
	2010	2012	ACRES LOST (-)	ACRES GAINED (+)	TOTAL ACREAGE CHANGED	NET ACREAGE CHANGED
Prime Farmland	30,876	27,733	3,710	567	4,277	-3,143
Farmland of Statewide Importance	952	841	132	21	153	-111
Unique Farmland	1,131	1,088	69	26	95	-43
Farmland of Local Importance	6,855	5,671	1,184	0	1,184	-1,184
IMPORTANT FARMLAND SUBTOTAL	39,814	35,333	5,095	614	5,709	-4,481
Grazing Land	231,475	235,829	408	4,762	5,170	4,354
AGRICULTURAL LAND SUBTOTAL	271,289	271,162	5,503	5,376	10,879	-127
Urban and Built-up Land	174,888	175,594	51	757	808	706
Other Land	674,570	673,991	1,100	521	1,621	-579
Water Area	3,318	3,318	0	0	0	0
TOTAL AREA INVENTORIED	1,124,065	1,124,065	6,654	6,654	13,308	0

Source : California FMMP, 2012

The project would require the acquisition of parcels zoned for agricultural uses by the County of Los Angeles, as shown in Table 14, but no relocation of farm operations would be required. Also, none of the affected parcels are under Williamson Act contract. A maximum of 8 affected parcels are currently in agricultural production.

Table 14: Impacts to Agricultural Uses (Acres)

Agricultural Impacts	Alternative 1	Alternative 1-with Loop	Alternative 2
Permanent & Temporary Impacts	1336.884	1307.574	972.224
Permanent Impacts	894.957	924.397	692.223

Source: Caltrans, Community Impact Analysis, December 2016

Avoidance, Minimization, and Mitigation Measures

AG-1: In cases where farming is unlikely to continue, the small remainder parcels are to be identified as a farmland conversion, and Caltrans will acquire these property remainders and offer them to adjacent farmland property owners.

AG-2: Caltrans will contribute to the California Farmland Conservancy Program's work to identify suitable agricultural land for mitigation of impacts to farmland and to fund the purchase of agricultural conservation easements from willing sellers. The performance standards for this measure are to preserve Important Farmland in an amount commensurate with the quantity and quality of the converted farmlands, within the same agricultural regions as the impacts occur, at a replacement ratio of not less than 2:1.

AG-3: Upon approval of the project, and when sufficient design details are known, Caltrans ROW staff will contact any potentially affected livestock owner to discuss how the project may affect grazing operations and to address compensation strategies as part of the Relocation Assistance Program (RAP).

AG-4: Within a 100-foot buffer area from future property lines with farmland, disturbed surface areas will be stabilized utilizing native vegetation and soils clear of invasive plant species. Soil amendments, if used, must comply with the requirements in the California Food and Agricultural Codes. Soil amendment must not contain paint, petroleum products, pesticides, or any other chemical residues harmful to animal life or plant growth. The construction contract will include provisions to protect against the spread of invasive species.

AG-5: Infill material to be used in the project shall not be obtained from borrow sites comprised of Prime Farmland. When selecting sites for wetland mitigation Prime Farmland will be avoided to the extent possible.

Cumulative Impacts

The Resource Study Area (RSA) for farmland is the Antelope Valley Planning Area. The proposed project is entirely within the Antelope Valley Planning Area of Los Angeles County. The Antelope Valley Area Plan is a comprehensive long-range plan to guide development in the Antelope Valley. The Area Plan is the foundational planning document for the development of the Antelope Valley for the next 20 to 30 years. The Plan was created to achieve the communities' shared vision of the future through specific goals, policies, land use and zoning maps, and other planning instruments.

Health and Historical Context

The Antelope Valley has undergone tremendous change and growth in the second half of the twentieth century with a shift from agriculture to defense and aerospace development. Large cropland and pasture areas in land use maps for the mid-1970's represent about 35,000 acres, less than half of the 73,000 acres irrigated in the early 1950's. Los Angeles County's farmland, which made it the nation's most productive agricultural county in the 1940s, has been steadily consumed by the advance of urbanization. And as agriculture faded elsewhere, the Antelope Valley's farms have accounted for more and more of the county's agricultural output. In the 1980s, the Antelope Valley's farmland also began rapidly transforming amid a countywide population and real estate boom. Land-use maps for 1984 and 1990 confirm these trends, showing a decrease in prime farmland (12 percent) and an increase in residential and other urban acreage (46 percent).

Overall, agricultural production has increased in the Antelope Valley since the mid-1990s due to the increase in production of vegetable crops (mainly onions and carrots) and fruit crops (mainly peaches)—28 percent and 15 percent, respectively. Agricultural acreage of vegetable crops increased significantly from 9,090 (1999) to 11,670 (2000), primarily due to the influence of the carrot industry. Also, there was a resurgence of irrigated agriculture in the Antelope Valley in 2002. Baby carrots, alfalfa, and other vegetable planted on land that had been long idled caused nearly 3,600 acres in prime farmland in the county, the highest level of active use since the mapping program began in 1984. Combined with urbanization and other changes, however, total agriculture declined by more than 1,400 acres. This trend continued through 2012. Notable conversions to urban land during the 2010-2012 period include the following:

- Lancaster: Approximately 80 acres of new homes were added in Lancaster, along with the Discovery School (~10 acres).
- Palmdale: New homes (~30 acres) and a Vallarta supermarket along with a CVS Pharmacy (~15 acres) were notable additions in Palmdale.
- Solar: Solar facilities were a significant source of Urban Land in the Antelope Valley in the form of the Palmdale 1 Solar Facility (~20 acres) east of Lancaster, a solar facility (~15 acres) nearby was also a major expansion (~50 acres) of an electrical substation which is part of the Tehachapi Renewable Transmission Project.

Reasonably Foreseeable Actions and Their Impacts

Table 15 lists the projects within the RSA that would have direct and/or indirect impacts.

Table 15: Reasonably Foreseeable Actions – Farmland Impacts

Project	Impact (acres)
California High Speed Train System (Bakersfield to Los Angeles)	63
High Desert Corridor Project (Los Angeles County Portion)	239
AV Solar Ranch One	Temporary Disturbance 2.1
Alpine Solar Project	522
Centennial Specific Plan and Project	652

The proposed project, in combination with other projects in the RSA would continue the regional trend of converting farmland to nonagricultural uses. Based upon the foregoing information, impacts of the project would combine with impacts of past, present and reasonably foreseeable actions to result in an unavoidable adverse cumulative impact.

3.1.4 COMMUNITY IMPACTS

The Caltrans Environmental Handbook Volume 4 Community Impact Assessment (Handbook) defines a community as "a population rooting in one place, where the daily life of each member involves contact with, and dependence on, other members." The handbook indicates that physical barriers such as highways, waterways, open spaces, activity centers, sharply different average home values, selected demographic characteristics, and resident perceptions can delineate communities or neighborhoods. In addition, local planning agency maps and reports define community neighborhood boundaries.

3.1.4.1 Community Character and Cohesion

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on 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.

Under the California Environmental Quality Act (CEQA), an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Affected Environment

A Community Impacts Assessment was completed for the proposed project, and the community boundaries within the project area are described in Section 3.1.1. The initial assessment of the proposed project was attained through review of aerial photographs and maps of the study area. Windshield surveys, interviews, and internet searches were then conducted to achieve a better understanding of the neighborhoods and communities that may be impacted by the proposed project. A field review of the project site and adjacent community was conducted on March 25th, 2015 to identify physical characteristics that naturally delineate areas, parks, community facilities, and general neighborhood cohesion. It also identified potential social and economic impacts to the adjacent community, as well as, to verify existing land uses.

The data was collected from the United States Census, American Fact Finder, California Department of Finance, Southern California Association of Governments (SCAG), and Los Angeles County Department of Regional Planning was used to assess the social, environmental, and economic impacts of the proposed project. The collected data were evaluated in spreadsheets, figures, and GIS analysis to understand the socioeconomic impacts of the project. The most recent data (2009-2013) from Census tracts within the project were compared to the demographic characteristics of the reference populations of Los Angeles County in order to identify potential impacts.

Caltrans and Metro have initiated an outreach program that has included a number of meetings with elected officials, town councils, stakeholders, and the community at large. The public has been kept apprised of the status of the project and provided input through the scoping process. A Notice of Preparation (NOP) and Notice of Intent (NOI) were issued in November 2013. Two scoping meetings were held in March 2014 and four Cooperating and Participating agency meetings were held between March 2014 and June 2015. In May 2015, two open houses were held to update the public and other interested stakeholders on the proposed project, and to provide information on the Alternatives. In addition, briefings and project update meetings were held with elected officials, resource agencies, and homeowner associations in the project area to present project updates and receive feedback. The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, in cooperation with Metro, held two public hearings in August 2016. All comments received during the public review period have been considered. This Final EIR/EIS was prepared to address all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS was completed. After the Final EIR/EIS is made available, if Caltrans decides to approve the project, a Notice of Determination will be published for compliance with CEQA, and a Record of Decision would be published for compliance with NEPA.

The Community Impact Assessment study area for this project was delineated by using aerial photographs, municipal boundaries, and physical characteristics that naturally delineate an area and the area in which both direct and indirect effects would likely occur at their greatest intensity. The study area is comprised of the small unincorporated towns and communities of Town of Antelope Acres, Fairmont, Gorman, Neenach, and Three Points, Los Angeles County and the unincorporated agricultural land in Los Angeles County. These communities fall within census tracts 9009 and 9012.09 respectively. In addition, the City of Lancaster and the City of Palmdale are larger metropolitan areas just south of the eastern project limits within the Antelope Valley.

The NW SR- 138 Project is located in a largely rural settlement. Residents within the communities value the quiet and slower pace of living. The Los Angeles County Department of Regional Planning (Los Angeles County DRP) Antelope Valley Area Plan describes each community varying “in its nature, form, and character…the unincorporated Antelope Valley “is a mosaic of unique small towns.” The “Community-Specific Land Use Concepts are intended to reflect each community’s unique nature, form, and character, as well as each community’s unique vision of the future”. The Area Plan’s Rural Preservation Strategy seeks to achieve the Area Plan’s Vision Statement through a framework of rural town center areas, rural town areas, rural preserve areas and economic opportunity areas (EOA). (Los Angeles County Department of Regional Planning, 2015, p. Comm-2&3).

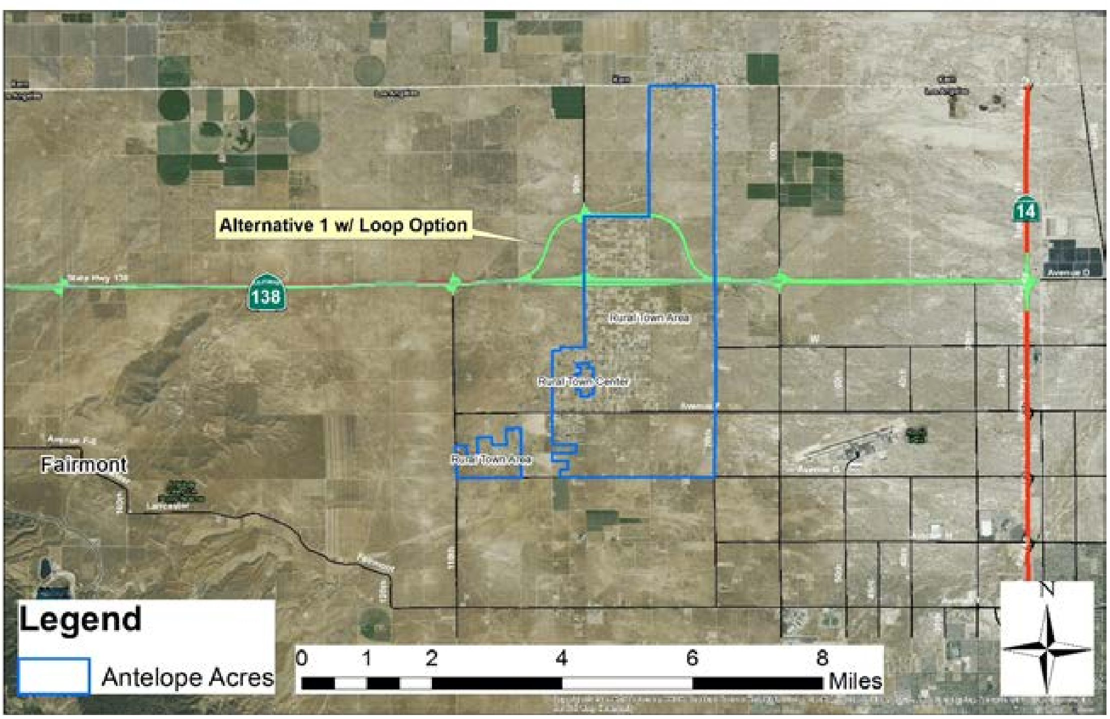
The Area Plan identifies, which include the East EOA, encompassing the communities of Lake Los Angeles, Sun Village, Littlerock, Pearblossom, Llano, and Crystalaire; the Central EOA, located along Avenue D, just north of William J. Fox Airfield and west of State Route 14 Freeway; and the West EOA near the Interstate 5 along State Route 138/Avenue D, immediately east and west of the California Aqueduct and including portions of the Neenach and Gorman communities.

Affected Environment
The following five communities are located within the project limits:

- Antelope Acres
- Gorman
- Three Points
- Fairmont
- Neenach/ Oso

The geographic boundaries provided in this discussion are approximate, and are not officially designated by the County.

Figure 10 Antelope Acres



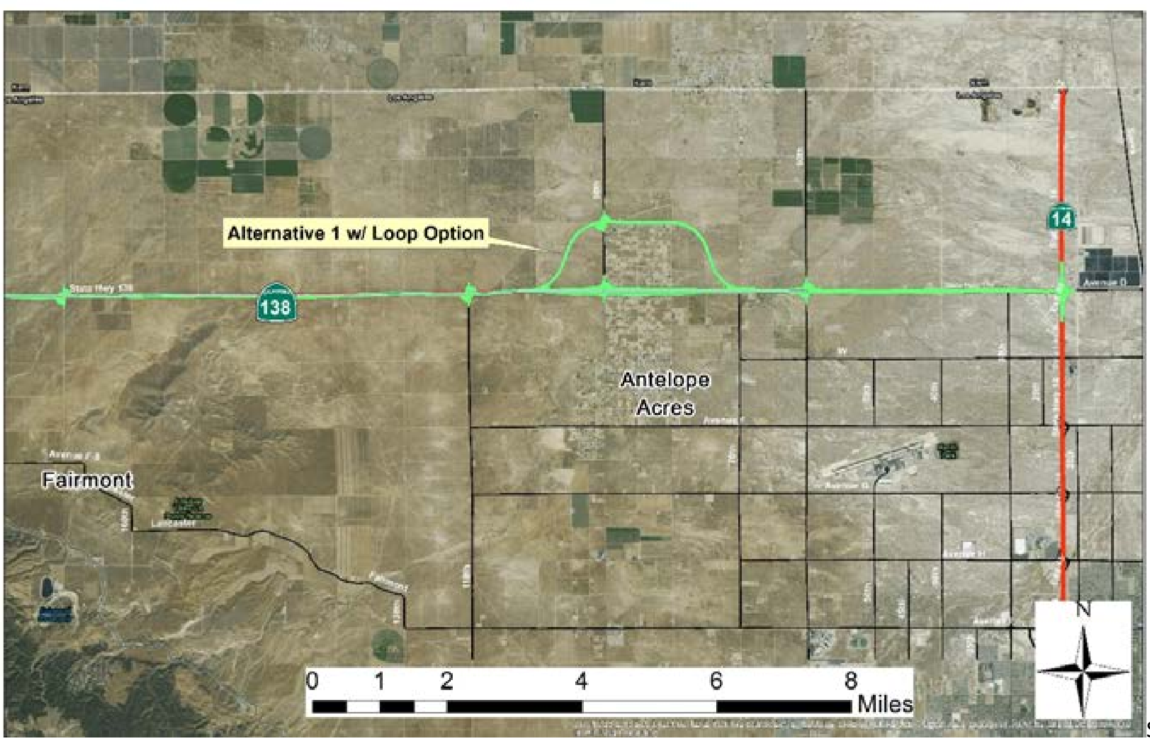
Source: Caltrans Environmental Planning

Antelope Acres is an unincorporated community in Los Angeles located in the northwestern portion of Antelope Valley, west of the City of Lancaster (Figure 10). Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while other portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas and Agricultural Resource Areas. The community has a rural town center area located along 90th Street West between Avenue E-4 and Avenue E-12. The rural town center area has been designated for Rural Commercial (CR) land uses to serve the daily needs of residents and provide local employment opportunities.

The community includes rural town areas that surround the rural town center area and are generally bounded by Avenue E and Avenue C to the north, 80th Street West to the east, Avenue F and Avenue F-8 to the south, and 95th Street West and 90th Street West to the west. These areas have been zoned as Rural Land 2 (RL2), with a maximum density of 1 residential unit per 2 gross acres of land. This designation is intended to reflect the existing density of the rural town areas and is not intended to promote further land divisions.

The remainder of the community is considered to be a rural preserve area and has been zoned as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints and environmental resources. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

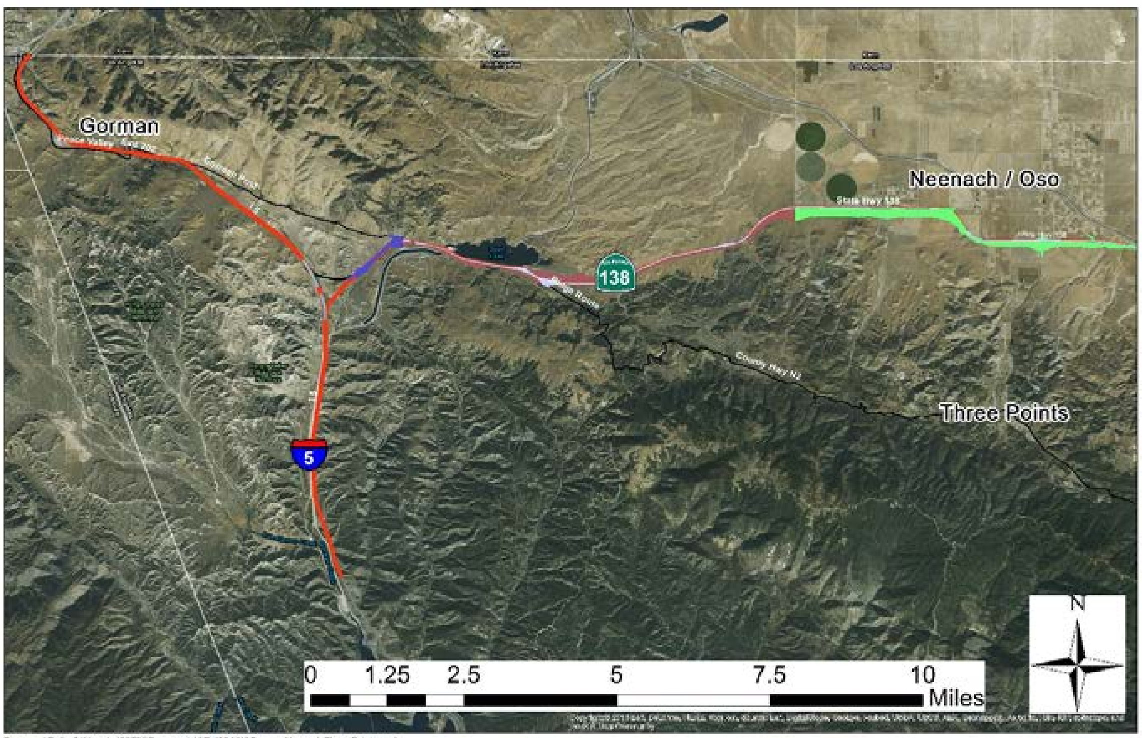
Figure 11 Fairmont



Source: Caltrans Environmental Planning

Fairmont is an unincorporated community in Los Angeles located in the northwestern portion of the Antelope Valley, west of Antelope Acres and near the Antelope Valley California Poppy Reserve (Figure 11). The Fairmont community is largely undeveloped. It does not have a rural town center area and consists of some single-family homes on large lots and some agricultural uses. The community includes environmental resources, such as Significant Ecological Areas. No portion of the community has been designated for commercial or industrial use, except for a parcel along Avenue D to reflect an existing use. The entire community is considered to be a rural preserve area and has been zoned as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land.

Figure 12 Gorman



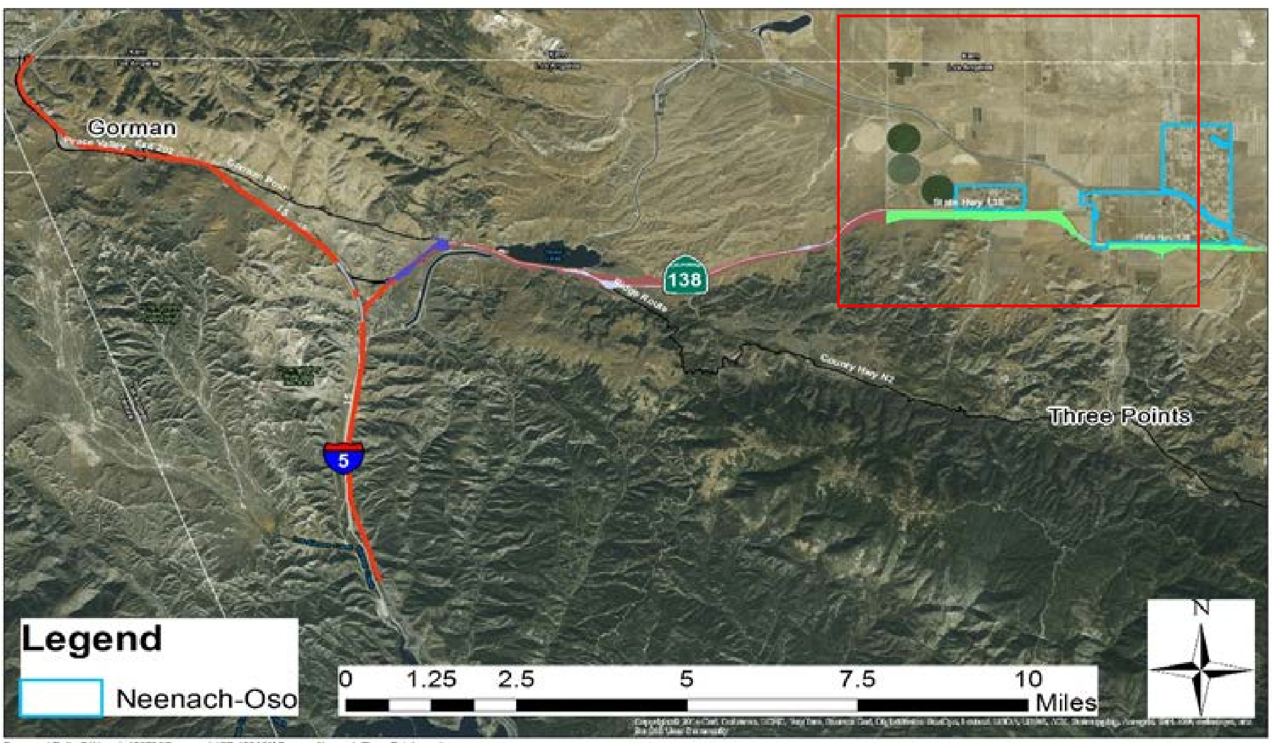
Source: Caltrans Environmental Planning

The town of Gorman is an unincorporated community in Los Angeles located in the northwestern portion of Antelope Valley near the Los Angeles / Kern County boundary. The community has a rural town center that consists of single family homes and light agricultural uses alongside Interstate 5 at Gorman School Road. The rural town center has been designated for commercial land uses (zoned CM for Major Commercial) and Rural Commercial (CR) land uses. These areas serve residents as well as interstate travelers.

Outside of the rural town center, the land is largely undeveloped and zoned as Rural Land 20 (RL20) limiting development to single-family homes on large lots, with light and heavy agriculture, equestrian and animal-keeping uses. The town of Gorman also consists of environmental resources such as Hillside Management Areas and Significant Ecological Areas. (Los Angeles County Department of Regional Planning, 2015, p. Comm 10-11).

Gorman is an unincorporated community in Los Angeles located in the far northwestern portion of Antelope Valley along the Golden State Freeway (Interstate 5) (Figure 12).   A portion of the community is partially developed with commercial uses that primarily serve travelers along the Freeway, along with some single-family homes and light agricultural uses. The remainder of the community is largely undeveloped, is generally not served by existing infrastructure, and contains environmental resources such as Hillside Management Areas and Significant Ecological Areas. The community has a rural town center area surrounding the Golden State Freeway interchanges at Gorman School Road. The rural town center area has been designated for Major Commercial (CM) land uses to serve the daily needs of residents and interstate travelers. Some areas outside the rural town center area have also been designated for Rural Commercial (CR) land uses in recognition of existing commercial uses and future opportunities to serve interstate travelers. The existing Flying J Travel Plaza on Frazier Park Road and two parcels east of it also have been designated for Rural Commercial (CR) land uses (Los Angeles County Department of Regional Planning, 2015). Several parcels surrounding Smokey Bear Road have been designated for Rural Commercial land uses. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside these CR and CM designations. The remainder of the community is considered to be a rural preserve area and has been zoned as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land.

Figure 13 Neenach / Oso



Source: Caltrans Environmental Planning

Neenach/Oso is an unincorporated community in Los Angeles located in the far western portion of the Antelope Valley, along Avenue D (State Route 138) (Figure 13). Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while other portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas and Agricultural Resource Areas. The community does not have a rural town center area but is served by the rural town center areas in Antelope Acres and Lake Hughes. A few parcels on Avenue D have been designated for Rural Commercial (CR) or Light Industrial (IL) land uses in recognition of existing and/or planned commercial and industrial uses. No other portions of the community have been designated for commercial or industrial use.

The community includes rural town areas that are generally bounded by Avenue B to the north, 270th Street West and 260th Street West to the west, Avenue D to the south, and 250th Street West on the east. These areas have been zoned as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. The remainder of the community is considered to be a rural preserve area and has been zoned as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land.

Figure 14 Three Points

Source: Caltrans Environmental Planning 2015

Three Points is an unincorporated community in Los Angeles located in the far western portion of the Antelope Valley, south of Neenach and northwest of Lake Hughes (Figure 14). The community is adjacent to the National Forest, includes environmental resources, such as scenic hillsides and Significant Ecological Areas. The community does not have a rural town center area but is served by the rural town center area in Lake Hughes. Aside from the parcel at the southwest corner of Three Points Road and Pine Canyon Road has been designated for Rural Commercial (CR) land uses in recognition of an existing commercial use, no other portions of the community have been designated for commercial or industrial use.

The entire community is considered to be a rural preserve area and has been zoned as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area is limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Housing

Of the 2,284 housing units in the project area, roughly 1,950 units are occupied. Of the total occupied housing units, 1,606 units are owner occupied and 334 units are rental occupied. The type of housing in the project area includes single-family detached housing on large lots. Buildings on lots also include farm worker housing and large sheds. The land use of the properties within the project area is made up of mostly RL10 and RL20 with a small portion made up of RL1, RL2, H2, and H5. The average median value of the housing price for the project area is $220,150 (Median Value (Dollars), 2009-2013 American Community Survey 5 Year Estimates). The average median value house in Los Angeles County is $420,200.

Table 16: 2010 Demographic Profile Data

Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
Total Housing units	1479	805	2284		3445076
Occupied Housing Units	1319	631	1950		3241204
Vacant Housing	160	174	334		203872
Owner Occupied	1094 82.9%	512 81.1%	1606 82.4%	82.1%	1544749 47.7%
Renter occupied	225 17.1%	119 18.9%	344 17.6%	17.9%	1696455 52.3%

Source: (Profile of General Population and Housing Characteristics: 2010) American Factfinder, US Census

Table 17: Median Value Dollars

Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
Median Value of House Dollars	$205,600.00	$234,700.00		$220,150.00	$420,200.00

Source: (2009-2013 American Community Survey 5 Year-Estimates, American FactFinder, US Census.)

Residents living within the study area primarily work in the City of Lancaster or the County of Los Angeles. The City of Lancaster is the major daily destination for services. Based on the 2009-2013 American Community Survey 5-Year Estimates, most residents commute to work using in a car, truck or van.

Table 18: Commute Data

Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
Means of transportation to work: Workers 16 years and over	1,429	476	1,905		4378758
Car, truck, van	1,173	385	1,558		3,170,087
Car, truck, van, carpool	164	53	217		463284
Public Transportation	17	1	18		309,362
Walked	9	7	16		126034
Other means	10	10	20		91313
Worked at home	56	20	76		218678
Mean travel time to work (minutes)	35.4	56.2		45.8	29.3

Source: Selected Economic Characteristics: 2009-2013 American Community Survey 5-Year Estimates

The average commute time to work in is 35.4 minutes for census track 9009 and 56.2 minutes for census track 9012.09. The average commute time for Los Angeles County is 29.3 minutes (Selected Economic Characteristics: 2009-2013 American Community Survey 5-Year Estimates). Residents in the area drive to work, shop, and to the bus or train station.

Demographic Characteristics

The project study area is comprised with 51.5% males and 48.5% females. The average median age of the population within the project area is 44.2 years old and the average median age is of males and females living within the project area is 43.8 and 44.8 years old, respectively.

Table 19: 2010 Demographic Profile Data

	Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
		Number Percentage				
	Total 2000 Population	3813	1633	5446		9818605
Sex Characteristics	Male	1927 50.5%	857 52.5%	2784	51.5%	4839654 49.3%
	Female	1886 49.5%	776 47.5%	2662	48.5%	4978951 50.7%
Age Characteristics	Median Age	41.5	46.9		44.2	34.8
	Median Age Male	40.5	47.1		43.8	33.6
	Median Age Female	42.7	46.8		44.75	35.9

Source: (Profile of General Population and Housing Characteristics: 2010) American FactFinder, US Census.

Based on the American Community Survey 5 Year Estimates, of the 3,999 population 16 years and over living within the project limit 1969 people are employed, 288 people are unemployed, 1742 people are not in the labor force and no one is part of the armed forces.

Table 20: Employment Status

Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
Civilian Force 16 years and Over	2,953	1,046	3,999		7,815,329
Civilian labor force	1,746	511	2,257		5,074,731
Employed	1,484	485	1,969		4,489,974
Unemployed	262	26	288		580,531
Armed forces	-	-	-		4,226
Not in labor force	1,207	535	1,742		2,740,598

Source: (Selected Economic Characteristics, 2009-2013 American Community Survey 5- Year Estimates) American FactFinder, US Census

Of the 3,429 population 25 years and over, 12% have an education attainment less than high school graduate, 23% are high school graduates, and 47% have some college or associate's degree and 18% have a bachelor's degree of higher.

Table 21: Education Attainment

Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Los Angeles County
Population 25 years and over	2,460	969	3,429	6,395,566
Less than high school graduate	270	126	396	1,488,728
High school graduate (includes equivalency)	533	265	798	1,306,726
Some college, associate's degree	1,218	404	1,622	1,690,947
Bachelor's degree or higher	439	174	613	1,909,165

Source: American FactFinder, US Census

The largest industry by occupation for civilians employed population 16 years and over is educational services, and healthcare and social assistance.

Table 22: Industry by Occupation for Civilian Population 16 Years and Over

Census Track	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
American Community Survey 5 Year Estimates 2005-2009 Civilian population 16 years and over	1,484	485	1,969		4,489,974
Agriculture, forestry, fishing and hunting, and mining	8	14	22		22,433
Construction	89	48	137		255,359
Manufacturing	347	37	384		483,592
Wholesale trade	13	21	34		162,995
Retail trade	182	31	213		478,076
Transportation and warehousing, and utilities	92	54	146		235,944
Information	53	4	57		195,741
Finance and insurance, and real estate and rental and leasing	13	14	27		286,163

Source: 2005-2009 American Community Survey Estimates, American FactFinder, US Census.

Based on the 2009-2013 American 5 year survey, of the residents living within the project area, 39% work in management, business science and art, 16% have service, 21% have sales and office, 13% have natural resources, construction and maintenance, and 12% have production, transportation and material moving type of occupation.

Table 23: Selected Economic Characteristics-Occupation

Demographic	Antelope Acres, Gorman	Neenach, Oso, Three Points, Fairmont	Total	Average	Los Angeles County
Civilian employed population 16 years and over	1484	485	1969		4489974
Management, business, science, and arts occupations	627	132	759		1584469
Service occupations	166	150	316		850692
Sales and office occupations	306	109	415		1123520
Natural resources, construction and maintenance occupations	201	47	248		355141
Production, transportation, and material moving occupations	184	47	231		576152

Source: 2009-2013 American Community Survey 5- Year Estimates, American FactFinder, US Census

Regional Economy

Any of the build alternatives along the NW SR- 138 Corridor should help improve the regional economy. Updating highway geometrics and safety features to current highway design standards should help facilitate safe and efficient movement of people and goods. It would increase Antelope Valley's accessibility to neighboring metropolitan regions via Interstate 5.

Table 24: Business Impacts

Type of Nonresidential Unit	Build Alternative 1	Build Alternative 1 (Antelope Acres Bypass Option)	Build Alternative 2
Commercial Businesses	1	1	1
Industrial/Manufacturing Businesses	1	1	1
Nonprofit Organizations	0	0	0
Agricultural/Farms	0	0	0
Total Nonresidential Units	2	2	2

Source: Northwest 138 Corridor Improvement Project Relocation Impact Report (March 2017)

Changes or interruptions in access to the independently owned and operated roadside businesses along the existing SR-138 corridor could have an impact on business revenue and visibility. Maintenance of access and visibility is critical as the majority of these businesses rely on motorists and locals within the community as their primary customer base.

Businesses

A large number of residents are retired or work outside the project area. Within the project area, local businesses include farming, solar farms, Golden Valley Real Estate, gas station, groceries, and restaurants. There are five known businesses open to the public located along the existing SR-138 Corridor, shown below.

Table 25: Local Businesses

Business Name	Location	Status
Hikertown	26803 W Ave C-15	Established
Omstar Plaza (Centennial Market, Café and Gas Station)	SR-138 and 230th St W	New; replaced Fairmont Market
Wee Vill Market	18348 W Ave D	Established
Fairmont Market	SR-138 and 230th St W	Closed
Gil's Country Store	SR-138 and 280th St W	Established
Golden Valley Real Estate Office	28101 W Ave C-6	Established

Source: Caltrans, Community Impact Analysis, December 2016

With the exception of Hikertown, which serves the needs of hikers along the Pacific Crest Trail, the businesses are small, independently owned and operated and serve the needs of local residents and motorists traveling along the existing SR-138. Therefore, it is critical to maintain access for the vitality of these businesses.

Community Facilities

The following locations serve as meeting facilities for the neighborhoods within and adjacent to the proposed project limits:

- Antelope Acres Community Center
- Omstar Plaza (Centennial Market, Café, and Gas Station) at 230th St W (just east of Neenach)
- Grace Chapel; 25649 W Ave D, Lancaster, CA 93536
- Gil's Country Store
- Wee Vill Market at 18348 W Ave D

The community facilities in the area also include the Quail Lake and various conservation, sanctuary and recreational area.

Table 26: Conservations, Sanctuaries, Trails and Recreational areas

	Name of Property	Type of Property
1	The Kinsey Mansion located south of Quail Lake at 34860 Lancaster Road	Historic
2	The Quail Lake	Recreation
3	Existing Pacific Crest Trail (PCT)	Recreation
4	Neenach Wildlife Sanctuary at 210th Street West, north of 138	Wildlife Refuge
5	Desert and Mountain conservation Authority Natural Reserve at 138 (south of) and 150th Street West.	Wildlife Refuge
6	The conservation parcel owned by the MRCA (Mountain Recreation and Conservation Authority) at SR 138 and 212th Street West, south of the SR138.	Wildlife Refuge
7	Hungry Valley Off Road Vehicle Recreation Area (west of I-5 and 138 intersection)	Recreation
8	Planned future relocated PCT trail at 300th Street West and SR-138	Recreation
9	Various trails that intersect SR138 at Three Point Road; 300 east of Three Point road; 245th street West/CA Aqueduct; 90th Street West; East of 140th Street West along the power line. These trails are County adopted planned trails and may already have existing recreational uses along their alignments.	Recreation
10	3 other conservation parcels owned by the Mountain Recreation and Conservation Authority in the vicinity but not immediately adjacent to the project footprints.	Wildlife Refuge
11	2 conservation parcels owned by the Transition Habitat Conservancy in the vicinity but not immediately adjacent to the project footprints.	Wildlife management area

Source: Appendix B, Section 4(f)

The only school in the project area is Neenach Elementary School, which has been closed since October 1, 2002. Neenach Elementary school was part of the Westside Union Elementary School District. Based on interviews, most children within the area are either home schooled or attend schools outside the project limits. These schools are part of the A.V. High School, El Tejon, Highs-Elizabeth lakes Union and Westside School Districts.

The main library and senior center is located in Lancaster. The town of Oso's community center is located in the same plaza as the town hall, gas station, restaurant and grocery. According to local residents, the residents of Antelope Acres stay locally or travel outside to other places for recreation. Local recreational activities include hunting and hiking. Quail Lake is not a popular destination for local residents.

Environmental Consequences

Build Alternative 1, Alternative 1 with Antelope Acres Bypass Option, and Alternative 2:

The study area is comprised of small unincorporated towns and the communities of Town of Antelope Acres, Fairmont, Gorman, Neenach, and Three Points. The Build Alternatives would modify the character of adjacent communities because the existing two lane highway would become a freeway/expressway or 4 lane highway. The displacement of businesses and residences under both Build Alternatives, as discussed in Section 3.1.4.2 Relocation and Real Property Acquisition, would adversely affect community character and cohesion.

The proposed build alternatives would directly impact the community of Antelope Acres. Build Alternative 1 with the bypass option would have minimal direct impacts on the community of Antelope Acres, however improvements associated with Build Alternative 1 without the bypass option and Build Alternative 2 would bisect the community. All other communities exist on either sides of the existing Sr-138.

At the western end of the project area, Alternative 1 would maintain the existing connector ramps to the I-5 freeway and provide a six-lane freeway facility to the Gorman Post Road interchange. East of Gorman Post Road interchange, the existing two–lane highway would be converted to future westbound lanes to orient the widening to the south to reduce impacts to Quail Lake. Alternative 1 would propose a grade-separated interchange near the current Gorman Post Road intersection on SR-138 to provide access to Department of Water Resource (DWR) facilities and private properties in this area. A tight horizontal curve located east of Quail Lake will be realigned to improve both the horizontal and vertical alignments with increased design speed and available stopping sight distance. Spread diamond interchanges are also proposed at Cement Plant Road and 300th Street West. To the east until SR-14, there are a number of existing at-grade intersections with local roadways which will be consolidated to restrict access to higher traffic roadways in order to improve safety and operations of the facility.

The use of a limited access conventional highway design under Alternative 2 would be less intrusive than the limited access expressway proposed under Alternative 1. Access along the corridor under Alternative 2 would be provided by signalized at-grade intersections with the exception of Gorman Post Road. Between Gorman Post Road and SR-14, all existing intersections with major roadways would be modified to restrict access to higher traffic roadways in order to improve safety and operations of the facility.

The presence of a freeway, expressway or limited access conventional highway would restrict northerly and southerly access in the project area. The resulting community aesthetic character would be changed because the presence of a highway / expressway infrastructure would detract from the open space look and feel of community.

The community of Antelope Acres has a rural town center area located along 90th Street West between Avenue E-4 and Avenue E-12. The rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of residents and provide local employment opportunities (Los Angeles County Department of Regional Planning, 2015). The community includes rural town areas that surround the rural town center area and are generally bounded by Avenue E and Avenue C to the north, 80th Street West to the east, Avenue F and Avenue F- 8 to the south, and 95th Street West and 90th Street West to the west.

Neenach/Oso is an unincorporated community located in the far western portion of the Antelope Valley, along Avenue D (State Route 138). Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while other portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas and Agricultural Resource Areas. The community does not have a rural town center area but is served by the rural town center in

Antelope Acres. The rural town center area is located to the south of the proposed alignment would not be affected by the Build Alternatives. Also, the proposed project would not result in the relocation of community services and/or facilities.

Local access is provided at various uncontrolled at-grade intersections and residential/business driveways throughout the corridor. Pedestrians and bicycles use this corridor to varying degrees. In the areas around Antelope Acres, Neenach and at the Pacific Crest Trail, there are locations where bikes and/or pedestrians traverse the roadway. The proposed improvements under the Build Alternatives would disrupt movement across the roadway, however, the project proposes several improvements that would connect the town and make it easier for pedestrians, bicyclists and vehicles to get to the other side of the highway. Diverting motorized and non-motorized modes of traffic to grade separated crossing points or signalized intersections may enhance safety for pedestrians, motorists, and cyclists. Furthermore, the relinquishment of the existing highway to the County as a local roadway for use as a local frontage road in areas where the proposed alignment deviates from the existing alignment to provide local circulation or to maintain current parcel access would minimize impacts related to community cohesion.

Pedestrian overcrossings are proposed at 3 locations to facilitate pedestrian and bicycle movement through the corridor. The locations are near 75th Street West, 100th Street West, and 280th Street West, and would be fully determined in the Design phase of the project.

The Los Angeles County Bicycle Master Plan map does not identify existing or proposed bike trails along SR-138. However, the Bicycle Master Plan does identify several proposed north-south and east-west Class III Bike Trails within Antelope Valley just south of SR-138. Within the immediate project area, a proposed Class III bike route would run north-south along Ridge Route Road, connecting SR-138 and Ridge Route Road at Quail Lake. The new proposed alignment would provide further continuity with the bike trails and provide cyclists access to new County trails within Antelope Valley in the region south of SR-138.

Under both build alternatives, existing intersections would be improved and consolidated where appropriate to improve the access and operations of the facility. Also, operational improvements under these alternatives, such as improving site distances and bringing non-standard roadway features to standard, would help improve emergency access and improve connections to residential and business property located along the corridor. Emergency access is discussed further in the Construction Impacts section.

Any of the Build Alternatives should help improve the regional economy by updating highway geometrics and safety features to current highway design standards. It would facilitate safe and efficient movement of people and goods. It would increase Antelope Valley's accessibility to neighboring metropolitan regions via Interstate 5.

Avoidance, Minimization, and/or Mitigation Measures
For Alternative 1 with the Antelope Acres Bypass, diverting the alignment to the north side of Antelope Acres would prevent community fragmentation.

COMM-1: Aesthetic treatments such as native landscaping, decorative sound walls, and energy efficient lighting fixtures would help minimize visual impact and reduce light pollution. Project design would be done in compliance with the Rural Outdoor Lighting District Ordinance of Los Angeles County.

COMM-2: Provide pedestrian overcrossings, minimize right-of-way width, and provide adequate signage to help minimize effects. The project would be designed to be sensitive to the existing environment in which it is constructed.

3.1.4.2 Relocation and Real Property Acquisition

Regulatory Setting

The Department's 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 Code of Federal Regulations (CFR) Part 24. The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons would not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. Please see Appendix D for a summary of the RAP.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 United States Code [USC] 2000d, et seq.). Please see Appendix C for a copy of the Department's Title VI Policy Statement.

Affected Environment

The following discussion incorporates the results of a *Relocation Impact Report* completed for the project (Metro and Caltrans District 7, March 2017).

Displacement Area

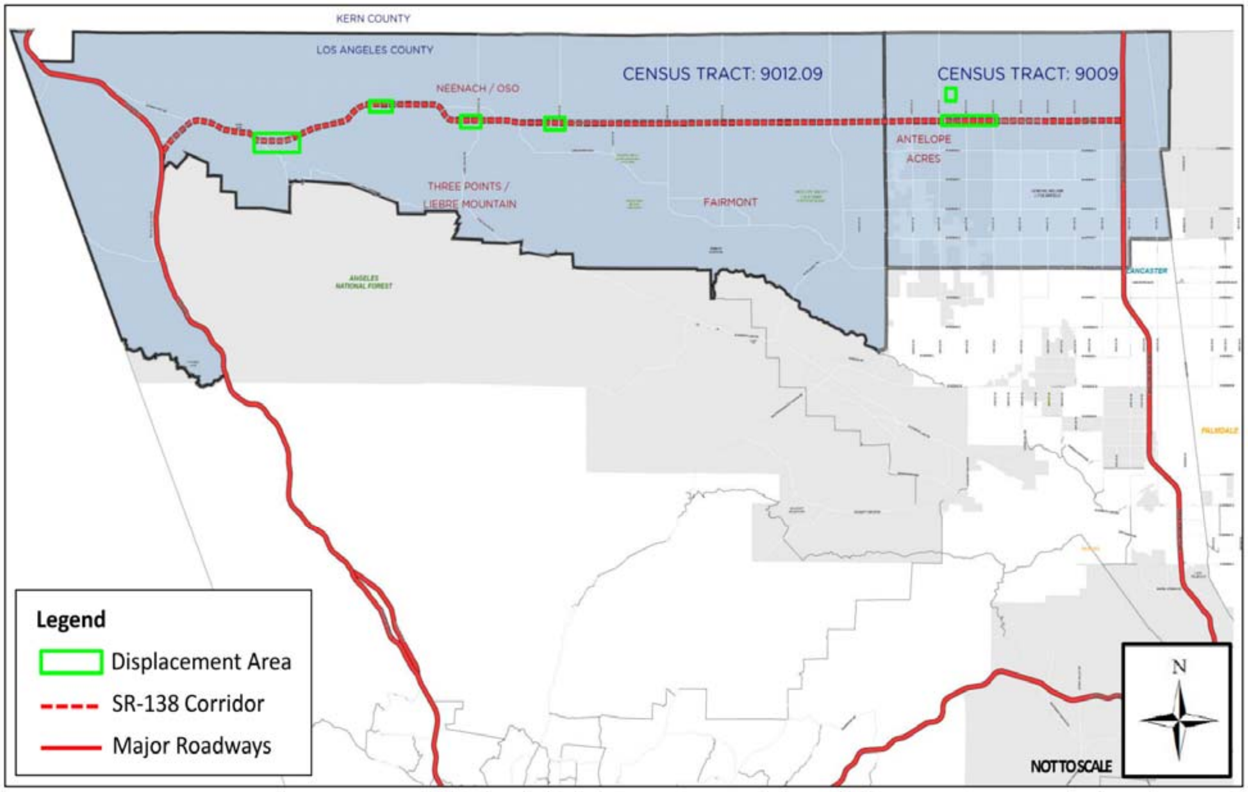
The displacement area is defined as the portion of the project area that would be affected by displacements. The displacement area is typically smaller and included within the project area. The project area is shown in Figure 15, and the displacement area is shown in Figure 16. The displacement area is located in a rural area within two census tracts (Census Tracts 9009 and 9012.09) that include the following unincorporated communities:

- Three Points/Liebre Mountain: This community is a sparsely populated settlement (a population of 200 persons in 2008) and includes an historic homestead (Los Angeles Times, 1991).
- Neenach/Oso: This community is currently a small agricultural settlement with a population of 800 persons (Gold, 2008).
- Fairmont: Approximately 1,700 acres within this community were dedicated in 1977 as the Antelope Valley California Poppy Reserve. Population information for this community was not readily available from U.S. Census data or other online sources.
- Antelope Acres: With a population of approximately 2,800 persons, the community has become the home to many commuters who work in nearby cities; however, there are still substantial ongoing agricultural operations in this community, including livestock and field crops (Wikipedia, 2015).

Figure 15 Project Area

NOT TO SCALE

Figure 16 Displacement Area



The California Aqueduct, which carries water from Northern California to Southern California, runs through the displacement area. Overall, land in the displacement area is predominantly vacant and undeveloped with very few amenities and facilities; however, there are some rural residences, small markets, a church, a feed/hardware store, a volunteer fire station, offices, agricultural fields, electrical utilities, and solar ranches in the displacement area. Municipal services are minimal, and many emergency services come from the City of Lancaster, approximately 13 miles to the southeast of the project area. The main access to and from these communities is from I-5, SR-14, and SR-138.

Demographic Data

Table 27 includes demographic data for the two census tracts in the displacement area, as provided by the 2010 United States (U.S.) Census and 2008-2012 American Community Survey 5-Year Estimates.

Table 27: Demographic Data for Displacement Area

Demographic Characteristic	Census Tract 9009		Census Tract 9012.09	
Population (Number of Persons)	3,690		1,449	
Median Household Income (2012 Inflation-Adjusted Dollars)	$90,395		$78,967	
Families Whose Income in the Past 12 Months is Below the Poverty Level (Percent (%) of All Families)	12.0		9.9	
Median Age (Years)	41.5		46.9	
Average Household Size (Number of Persons per Household)	2.88		2.57	
Disabled Persons (% of Population)	11.7		9.5	
Primary Race/Ethnic Groups (% of Population)				
White	82.1		94.1	
Hispanic	21.4		16.6	
Education Attainment (% of Population)				
High School Graduate or Higher	90.6		91.1	
Bachelor's Degree or Higher	20.1		13.1	
Employment Destination in 2011 (% of Population)				
Los Angeles, CA	22.5		28.6	
Santa Clarita, CA	2.7		6.0	
Lancaster, CA	16.5		4.8	
Burbank, CA	3.9		4.3	
Palmdale, CA	10.7		2.7	
Commuter Profile	Number of Persons	% of Population	Number of Persons	% of Population
Total Commuters (16 and over)	1,502	-	687	-
Drove Alone	1,224	81.5	453	65.9
Carpool	197	13.1	202	29.4
Public Transportation	0	0	1	0.1
Walked	8	0.5	0	0
Other Means	10	0.7	9	1.3
Worked at Home	63	4.2	22	3.2
Mean Travel Time (minutes)	31.5		53.8	

Source: U.S. Census Bureau, 2013

Environmental Consequences

Proposed Acquisitions

The proposed residential and business acquisitions required for the project are listed in Table 28 below, including the number of full and partial acquisitions.

Table 28: Proposed Acquisitions by Alternative

Land Use	Alternative 1		Alternative 1 (Antelope Acres Bypass)		Alternative 2	
	Partial	Full	Partial	Full	Partial	Full
Vacant	369	50	388	68	429	17
Residential	10	13	9	7	42	10
Commercial/Industrial	9	1	9	1	6	1
Farm/Agricultural	11	1	10	1	12	1
TOTAL	**399**	**65**	**416**	**77**	**489**	**29**

Source: Relocation Impact Report November 2015

When only a portion of a property is required for a project, every reasonable effort is made to ensure that owners/occupants do not suffer damages to the remainder of the property (Caltrans, n.d.). The total payment for a property includes the portion of the property that has been purchased, and any loss in market value to the remaining property. The determination of any loss in market value requires an appraisal involving many variables. As part of the Caltrans' RAP, a Caltrans Right of Way (ROW) agent will explain to owners/occupants the effect of a partial acquisition on the remaining portion of a property during the plans, specifications and estimate (PS&E) and ROW acquisition phase of the project.

Residential Displacements

As shown in Table 29, Alternative 1 would result in the displacement of 17 residential units and approximately 46 persons, based on an average of 2.7 persons per household for Census Tracts 9009 and 9012.09, and Alternative 1 with Antelope Acres Bypass would result in the displacement of 11 residential units and approximately 30 persons. Alternative 2 would result in the displacement of 14 residential units and approximately 38 persons.

Caltrans commits to Providing Relocation Assistance and Counseling to all displaced persons and businesses in accordance with the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act, to ensure adequate relocation benefits to all displaced persons and businesses. All eligible displacees will receive moving expense benefits. All benefits and services will be provided equitably to all eligible displacees without regard to race, color, religion, age, national origins and disability as specified under Title VI of the Civil Rights Act of 1964. An estimated 14 total residential units may be acquired.

Caltrans commits to conducting Displacee Interviews in order to identify eligible displacees with special needs, and to provide a greater understanding of household demographics and the financial challenges facing displacees, and to obtain an accurate representation of the total residential units affected. Displacee Interviews will be conducted during the Design Phase of the project (PS&E), during the right-of way-certification process. This is anticipated to occur in late 2020. Displacee Interviews were initially scheduled to occur earlier, during preparation of the FRIR. The timing of the Displacee interviews shall in no way adversely affect Caltrans conformity with the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act.

Table 29: Estimated Residential Displacement Units by Alignment

Type of Occupant	Alternative 1	Alternative 1 (Antelope Acres Bypass)	Alternative 2
Single-Family Residences	15	9	13
Multiple-Unit Residences	0	0	0
Mobile Homes	2	2	1
Total Residential Units	**17**	**11**	**14**
Total Persons (based on an average of 2.7 persons per household)	**46**	**30**	**38**

Source: ParcelQuest, 2015

Table 30 includes the details of the displaced residences under each build alternative, including the community, type of residence, construction date, and estimated value. Based on the total estimated values listed below, the median home value for the displacement area is $235,033.

Table 30: Details of Displaced Residences under Build Alternatives

Alternative	Assessor's Parcel Number (APN)	Community	Type of Residence	Number of Bedrooms/ Bathrooms (bd/bath)	Year Built	Total Estimated Value
2	3220-020-034	Antelope Acres	Mobile Home	4 bd/2 bath	2006	$130,640
2	3220-020-038	Antelope Acres	Single-Family Residence	3 bd/1 bath	1948	$36,155
2	3220-020-039	Antelope Acres	Single-Family Residence	3 bd/ 3 bath	2004	$246,000
1 with Antelope Acres Bypass (bypass)	3233-003-014	No Community Designation	Single-Family Residence	3 bd/2 bath	2006	$268,000
1	3233-021-027	Antelope Acres	Single-Family Residence	4 bd/3 bath	2006	$258,000
1	3233-021-028	Antelope Acres	Single-Family Residence	4 bd/ 2 bath	2007	$228,532
1 and 2	3233-021-031	Antelope Acres	Single-Family Residence	3 bd/2 bath	1986	$256,852
1 and 2	3233-022-027	Antelope Acres	Single-Family Residence	3 bd/2 baths	1977	$235,033
1	3233-022-028	Antelope Acres	Single-Family Residence	3 bd/3 baths	1985	$224,900
1 and 2	3233-022-029	Antelope Acres	Single-Family Residence	3 bd/2 baths	1990	$261,180
1	3233-022-030	Antelope Acres	Single-Family Residence	3 bd/3 baths	2006	$259,000
1 and 2	3252-018-048	No Community Designation	Single-Family Residence (assume three residential displacements)	3 bd/3 baths	1991	$325,000

1 and 2	3252-018-049	No Community Designation	Single-Family Residence (assume two residential displacements)	3 bd/3 baths	2005	$509,340
1 and 1 with bypass	3260-017-004	No Community Designation	Mobile Home	3 bd/2 baths	1991	$104,894
1 and 1 with bypass	3275-008-011	Neenach	Single-Family Residence	4 bd/2 baths	1987	$211,289
1, 1 with bypass, and 2	3279-001-043	Fairmont	Single-Family Residence	3 bd/2 baths	1947	$204,925
1, 1 with bypass, and 2	3279-003-026	Fairmont	Single-Family Residence	2 bd/2 baths	1978	$115,605
1, 1 with bypass, and 2	3279-003-055	Fairmont	Mobile Home	3 bd/2 baths	1989	$95,000

Source: ParcelQuest, 2015; Los Angeles County Department of Regional Planning, 2015

Business Displacements

Alternatives 1, Alternative 1 with Antelope Acres Bypass, and Alternative 2 would result in the displacement of two businesses (Assessor's Parcel Numbers (APN) 3252-018-049 and 3279-001-004). No nonprofit organizations would be displaced under these alternatives. Although land zoned for agricultural use would be acquired under the build alternatives, this land is currently vacant, and therefore, no agricultural/farm operations would be displaced as a result of the project.

Table 31: Estimated Nonresidential Displacement Units by Alignment

Type of Nonresidential Unit	Alternative 1	Alternative 1 (Antelope Acres Bypass)	Alternative 2
Commercial Businesses	1	1	1
Industrial/Manufacturing Businesses	1	1	1
Nonprofit Organizations	0	0	0
Agricultural/Farms	0	0	0
Total Nonresidential Units	**2**	**2**	**2**

Source: ParcelQuest, 2015

The business on APN 3252-018-049 is located on a five-acre property with an approximate value of $509,340 (ParcelQuest, 2015). The business is located on the same parcel as a single-family residence constructed in 2005. Based on preliminary research, the property includes a warehouse building, work vehicles, and a small airplane, and is assumed to be a commercial business for the purposes of this report. Additional information on this business, including the name and type of the business, or the employee and customer profile, was not readily available in public records.

The business on APN 3279-001-004 is a 4,800 square-foot light industrial warehouse constructed in 1948 on an 8-acre property with an approximate value of $70,426 (ParcelQuest, 2015). The business is located in the community of Fairmont. Additional information on this business, including the name and type of the business, or the employee and customer profile, was not readily available in public records.
Issues that employees may have if the businesses relocate would be determined during owner and occupant interviews to be conducted during the Design Phase of the project (PS&E), during the right-of

way-certification process. This is anticipated to occur in late 2020. Displacee Interviews were initially scheduled to occur earlier, during preparation of the FRIR. The timing of the Displacee interviews shall in no way adversely affect Caltrans conformity with the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act.

Replacement Area

The replacement area is defined as the local area where residential and business displacees would likely secure replacement sites. Generally, if there are services and resources available in the immediate area, businesses prefer to relocate as close as possible to their existing location, and residential displacees prefer to remain in existing school systems and their immediate familial and cultural settings.

The replacement area, as shown in Figure 17, includes the unincorporated communities of Green Valley, Lake Hughes, Elizabeth Lake, Leona Valley, and Quartz Hill, which are within 10 miles of the displacement area. The replacement area was determined by the availability of replacement single-family residences and comparable business sites for displacees.

Figure 17 Replacement Area

In addition, the replacement area is the most similar to the displacement area in rural character and socioeconomic status, and has the highest likelihood of receiving displaced residents and businesses because of the availability of replacement properties with similar average purchase prices as the displacement area.

The communities within the replacement area are also located within 10 miles of the displacement area; therefore, the commute distance to jobs and schools would be reasonable and would not result in

substantial hardships for the displacees. In addition, residential displacees would have access to schools within the same school district in the replacement area as they had in the displacement area.
The main demographic characteristics of the displacement and replacement areas are shown in Table 32, as provided by the 2010 U.S. Census and 2008-2012 American Community Survey five-Year Estimates.

Table 33 shows the lowest, average, and highest prices of single-family homes in the replacement area communities, as provided by online real estate websites, and indicates that there are several active listings for each community in the replacement area. In addition, according to the U.S. Census Bureau, the median home values of single-family homes in the displacement area and replacement area are similar, with a median home value of $235,033 in the displacement area, and a median home value ranging from $124,200 to $368,500 in the replacement area depending on the community (U.S. Census Bureau, 2009-2013 American Community Survey, 2013). Therefore, the affordability of replacement housing would be comparable to that of the displacement area. Rental rates for the displacement area were not readily available from U.S. Census datasets. The median rent in the replacement area ranges from $976 to $1,349 per month, depending on the community (U.S. Census Bureau, 2009-2013 American Community Survey, 2013).

The replacement sites for the businesses requiring relocation under Alternatives 1 and 2 should be approximately five to eight acres and should consist of enough undeveloped land for outdoor storage of vehicles and equipment. The replacement area includes several vacant properties currently for sale, which could serve as potential relocation properties for the businesses (Coldwell Banker, 2015). The purchase price of six-acre to 10-acre lots in the replacement area is approximately $29,000 (Coldwell Banker, 2015).

Research shows that the real estate market in the replacement area currently has adequate availability of residential and business properties to meet the relocation demands of the displacees. It is expected that the market availability would remain adequate through the time of displacement because of the additional development that is planned adjacent and surrounding the project area (e.g., Centennial Master Plan and Gorman Post Ranch) that will make additional housing available concurrently with the subject project. However, there is a potential substantial relocation problems for displacees as a result of overcrowded residences, higher rents, competition from cash offers by investors, and the potential of displaced homeowners not qualifying for home loans as a result of foreclosures. Therefore, Caltrans may require a longer timeline to vacate properties, and Last Resort Housing Program payments may be required to relocate residential households being displaced.

Table 32: Demographic Characteristics of Displacement and Replacement Areas

Demographic Characteristic	Displacement Area		Replacement Area				
	Census Tract 9009	Census Tract 9012.09	Green Valley	Lake Hughes	Elizabeth Lake	Leona Valley	Quartz Hill
Population (Number of Persons)	3,690	1,449	1,027	649	1,756	1,607	10,912
White (Percent (%) of Population)	82.1	94.1	87.7	83.8	90.6	87.6	75.3
Hispanic (% of Population)	21.4	16.6	12.0	16.0	13.2	12.0	24.6
Average Household Size (Number of Persons Per Household)	2.88	2.67	2.32	2.09	2.61	2.75	2.93
Median Age (Years)	41.5	46.9	47.0	47.8	42.2	47.4	36.6
Median Household Income (2012 Inflation-Adjusted Dollars)	$90,395	$78,967	$91,119	$52,969	$91,111	$81,154	$55,423

Source: ParcelQuest, 2015; Los Angeles County Department of Regional Planning, 2015

Table 33: Prices of Single-Family Homes Based on Active Real Estate Listings

Community	Number of Active Listings	Lowest Price	Average Price	Highest Price
Green Valley	18	$68,300	$333,105	$700,000
Lake Hughes	11	$79,000	$1,081,615	$4,999,000
Elizabeth Lake	6	$170,000	$265,316	$389,900
Leona Valley	10	$245,000	$548,070	$899,000
Quartz Hill	13	$169,900	$332,553	$639,000

Source: Coldwell Banker, 2015

Relocation Problems and Programs

Demographic research from real estate websites shows that there are an adequate number of available commercial and residential replacement sites within 10 miles of the project area (Coldwell Banker, 2015), and no relocation problems were identified based on this data.

Residential relocations may have physical, financial, and/or psychological effects. The physical effects include finding and moving into suitable replacement housing. For persons with special needs, such as the elderly or disabled, these physical impacts can be challenging. Financial impacts may include moving expenses, increased living expenses, increased commute to work costs, or increased property taxes. Financial problems also include problems qualifying for home loans as a result of foreclosures, which have been an issue in the project vicinity. According to data from RealtyTrac, an Irvine real estate data firm (as provided in a January 15, 2015 news article in the *San Fernando Valley Business Journal*), one in every 1,212 homes in Los Angeles County was in foreclosure in December 2014 (Klein, 2015). In the Antelope Valley, Palmdale topped the list with one out of every 386 homes in foreclosure, and in Lancaster, one out of every 454 homes was in foreclosure.

Other relocation problems include overcrowded residences and high rents/mortgages compared to displacee incomes, resulting in the need for Last Resort Housing Program payments. Where there are overcrowded residences or where multiple families reside, there may be a need for Last Resort Housing. In addition, the Last Resort Housing Program would apply if residents pay more than 30 percent of their income toward rent. According to Homefacts.com, in Palmdale, 43 percent of homeowners pay more than 30 percent of their income toward their mortgage, and 73 percent of renters pay more than 30 percent of their income toward rent. In Lancaster, 44 percent of homeowners pay more than 30 percent of their income toward their mortgage, and 60 percent of renters pay more than 30 percent of their income toward rent (Homefacts, 2015). Therefore, there is potential that the Last Resort Housing Program payments would be needed to relocate residential households being displaced. The applicability of the Last Resort Housing Program will be confirmed during the Design Phase of the project (PS&E), during the right-of way-certification process.

Additional relocation problems affecting affordable replacement housing may result from homebuyers losing out to all cash offers from investors. According to the California Reinvestment Coalition (CRC) (as provided in a June 28, 2015 news article in the *San Gabriel Valley Tribune*), a survey of 80 community-based nonprofits found that "renters, would-be homebuyers and black households [are] losing ground in the face of competition from investors and a widening racial wealth gap" (Smith, 2015). The news article states that the Community Reinvestment Act was designed to help meet the credit needs of low- and moderate-income neighborhoods. Lori Gay, president and Chief Executive Officer (CEO) of

Neighborhood Housing Services of Los Angeles County said her organization was awarded a $60 million grant from the United States Department of Housing and Development (HUD), "but even with all that cash, we still get outbid by investors – sometimes even before the properties are even placed on the market. In some cases investors are buying up to 500 homes at a time" (Smith, 2015). According to Kevin Patterson, president of Palmdale's RentSource Corporation, "Fewer homes are being built because of water restrictions, and over the past six to nine months rents have increased by $300 to $600 a month on average." These issues could affect the availability of replacement property, which would necessitate longer timelines for Caltrans to find replacement housing.

The psychological effects of relocation are primarily related to the change in a person's living conditions. People may become attached to their homes and communities, and are often unwilling to move. Psychological impacts may be especially serious for elderly and disabled persons, families with children in school, long-term residents, and mobile home residents.

The adverse psychological and social impacts of relocations are more difficult to alleviate than physical and financial impacts. Certain population groups, such as senior citizens, low-income residents, and non-English speaking people often have strong community ties and depend on primary social relationships and important support networks that can be severed upon relocation. Households with school-aged children may consider relocation especially disruptive if school transfers are involved. Disabled people and those without automobile transportation often have special relocation problems.

To minimize potential impacts on these and other population groups, Caltrans' RAP includes advisory services to assist individuals and businesses being displaced by a public project. The advisory assistance services include outreach to discuss needs and preferences regarding the details of a move, explain the rights and benefits available, and provide help obtaining monetary benefits. In addition, the advisory assistance includes information on available replacement sites, including purchase and rental costs, and coordinating and educating landlords, property managers, and other real estate professionals to help secure replacement properties.

Interviews with potential displacees would provide a greater understanding of household demographics and financial challenges facing each respective owner and occupant. Interviews with potential displacees are typically conducted only for FRIRs; therefore, interviews were not conducted in the preparation of the DRIR. Interviews would be conducted during preparation of the FRIR, and the findings would be included in the Final EIR/EIS.

The project proposes to acquire land using corridor preservation in compliance with the Department policy of Designation of Special Corridors for Priority Acquisition. This policy is codified as California Government Code Section 65081.3 and California Public Resources Code Section 33910 (Eaves) authorize the Department to acquire land located within a designated corridor of statewide or regional priority to be held and maintained for future transportation purposes.

Acquisition may be through donations, purchase, or other means. Each land acquisition proposal is submitted for review and recommended action to the regional transportation planning agency in whose jurisdiction the land is located. The Department may approve the acquisition only after the regional transportation planning agency holds a hearing and finds that potential transportation facilities to be located on the land can be constructed in a manner that would avoid or mitigate specified environmental impacts or values. Right of Way can acquire property for corridor preservation as indicated in the California codes indicated above, only when authorized by the local entity.

Designation of Special Corridors for Priority Acquisition is additionally in compliance with 23 U.S.C. 134 and 135; 42 U.S.C. 7410 et seq.;49 U.S.C. 5303 and 5304; 49 CFR 1.48, 1.51 and 613 et seq.; 23 CFR 450 et seq. Special care would be taken with hardship acquisition and protective buying procedures in connection with properties subject to the provisions of 49 U.S.C. 303, commonly referred to as Section 4(f) [parks] or 16 U.S.C. 470(f) [historic properties], until the required Section 4(f) determinations and the procedures of the Advisory Council on Historic Preservation are met.

If corridor preservation is not authorized by the local regional transportation planning agency, land acquisition would be performed on a per segment / phase bases as is typical.

Cumulative Impacts

Additional residential and commercial developments are planned to be constructed in adjacent and surrounding areas (e.g., Centennial Master Plan and Gorman Post Ranch). It is anticipated that any additional relocation impacts from other projects in the region would be minimized because there would be additional available housing and business sites to accommodate displacees. Therefore, the project’s impacts, in combination with the impacts of other past, present, and reasonably foreseeable projects, would not be cumulatively considerable.

Avoidance, Minimization, and/or Mitigation Measures

Based on current real estate data, there appears to be an adequate availability of replacement properties with similar purchase prices and amenities as the displaced properties, and no relocation problems have been identified based on this data. However, there is potential for relocation problems if there are overcrowded residences, higher rents, competition from cash offers by investors, and the potential of displaced homeowners not qualifying for home loans as a result of foreclosures. Therefore, Caltrans may require a longer timeline to vacate properties, and Last Resort Housing Program payments may be required to relocate residential households being displaced. To minimize potential impacts on displacees, Caltrans’ RAP would provide advisory services to assist individuals and businesses being displaced by the project. Additional plans to minimize hardships on potential displacees will be developed further following owner and occupant interviews to be conducted during the PS&E and ROW acquisition phases of the project. These interviews will provide a greater understanding of household demographics and financial challenges facing each respective owner and occupant.

RELOCAT-1: To ensure that persons displaced as a result of the project are treated fairly, consistently, and equitably, relocation services and benefits shall be administered according to Caltrans’ Relocation Assistance Program (RAP). As part of Caltrans’ Relocation Assistance Program (RAP), advisory services would be provided to assist individuals and businesses displaced by the project.

RELOCAT-2: Land using corridor preservation would be acquired in compliance with the Department policy of Designation of Special Corridors for Priority Acquisition, codified as California Government Code Section 65081.3 and California Public Resources Code Section 33910 (Eaves). Designation of Special Corridors for Priority Acquisition shall also be in compliance with 23 U.S.C. 134 and 135; 42 U.S.C. 7410 et seq.;49 U.S.C. 5303 and 5304; 49 CFR 1.48, 1.51 and 613 et seq.; 23 CFR 450 et seq.

Special care would be taken with hardship acquisition and protective buying procedures in connection with properties subject to the provisions of 49 U.S.C. 303, commonly referred to as Section 4(f) [parks] or 16 U.S.C. 470(f) [historic properties], until the required Section 4(f) determinations and the procedures of the Advisory Council on Historic Preservation are met.

3.1.4.3 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President William J. Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2013, this was $23,550 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement, signed by the Director, which can be found in Appendix C of this document.

Affected Environment

The study area for the consideration of environmental justice populations potentially impacted was defined as the census tracts for the communities directly adjacent to the project area. The environmental justice analysis applies the following methodology to identify minority and low-income populations:

Census tracts are considered to have substantial minority populations if the percentage of minority residents within them is more than 10 percentage points higher than the County Subdivision and/or the County average.

Census tracts are considered to have substantial low-income populations if the percentage of residents within them who are living below the Census Bureau's defined poverty threshold is more than 5 percentage points higher than the County Subdivision and/or the County average.

The environmental justice analysis was conducted using demographic information from the 2009–2013 American Community Survey 5-Year Estimates. The low-income threshold was adapted in order to make use of available data. The Census Bureau determines the number of persons living below poverty based on the Census Bureau's poverty thresholds, which differ slightly from the poverty guidelines defined by the Department of Health and Human Services (DHHS). For 2013, the Census Bureau's preliminary weighted average poverty threshold for a family of four was $23,834. For 2013, DHHS established a poverty guideline of $23,550 for a family of four.

Table 34: Project Area Demographics

	Project Area (Census Tracts 9012.9 & 9009)				North Antelope Valley Census County Division (CCD)		Los Angeles County	
	2013 Population (9012.9)	Percent of Total Population	2013 Population (9009)	Percent of Total Population	2013 Population	Percent of Total Population	2013 Population	Percent of Total Population
Total Population	1,193	100	3,648	100	189,951	100	9,893,481	100
Hispanic or Latino (of any race)	191	16.0	867	23.8	71,569	37.7	4,741,492	47.9
African American (Not Hispanic or Latino)	80	6.7	27	0.7	31,071	16.4	803,913	8.1
American Indian and Alaska Native (Not Hispanic or Latino)	0	0.0	59	1.6	757	0.4	17,674	0.2
Asian (Not Hispanic or Latino)	38	3.2	285	7.8	9,021	4.7	1,356,049	13.7
Native Hawaiian and Other Pacific Islander (Not Hispanic or Latino)	0	0.0	0	0.0	532	0.3	23,289	0.2
Low-Income	185	15.5	495	13.6	38.689	21.2	1,737,224	17.8

Source: Relocation Impact Report, November 2015

As identified in the table above, the project area does not contain higher than average concentrations of environmental justice populations when compared to the area surrounding the project area or the county.

Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, the Alternatives 1 and 2 would not cause disproportionately high and adverse effects on any minority or low-income populations as per EO 12898 regarding environmental justice.

3.1.5 UTILITIES/ EMERGENCY SERVICES

Affected Environment

The project corridor spans 36 miles and includes multiple utilities. Impacts to the existing utility systems vary between the Build alternatives. The following existing utility systems that could be affected by one or more of the build alternatives:

- The Southern California Edison 12 kV overhead electric distribution and 66 kV overhead electric transmission lines
- The Southern California Edison 500 kV overhead electric transmission line
- The Southern California Gas underground 4” and 12” natural gas pipelines
- The AT&T overhead and underground fiber optics telecommunication cable line
- The Verizon overhead and underground fiber optics telecommunication cable line
- The Time Warner underground fiber optics telecommunication cable line
- The Sundale Mutual Water Company underground 20” water pipeline
- The West Valley County Water District underground 12” water pipeline
- The Los Angeles Department of Water Power underground water pipelines, 87” and 10” diameter

Table 35: Potential Affected Utility systems

OWNER	FACILITY TYPE	UNDERGROUND (UG)/ OVERHEAD (OH)	SIZE
Southern California Edison	Electric	OH	12 kV
			66 kV
			500 kV
Southern California Gas	Natural Gas	UG	4"
			12"
AT&T	Telephone	UG	TBD
	Fiber/Telecom	OH	TBD
Verizon	Fiber/Telecom	UG	TBD
		OH	TBD
Time Warner	Fiber/Telecom	UG	TBD
West Valley Water District	Water Main	UG	12"
Los Angeles Department of Water and Power	Water Line	UG	TBD

Source: Relocation Impact Report, November 2015

Environmental Consequences

Tables 36 and 37 identify the utilities that would be affected with the implementation of Alternatives 1 and 2.

Alternative 2 proposes the same right of way width on SR-138 as Alternative 1 from I-5 to 240th Street West, but a narrower right of way width from 240th Street West to SR-14. As a result, Alternative 2 affects many of the same overhead and underground utilities as Alternative 1; however, the extent of the impact is less on the eastern portion of the corridor.

Table 36: Utility Conflict Summary Alternative 1				
OWNER	**FACILITY TYPE**	**UNDER GROUND or OVER HEAD (UG or OH))**	**SIZE**	**LENGTH or FACILITIES IDENTIFIED FOR RELOCATION**
Southern California Edison	Electric	OH	12 kV	122 power poles; 31 joint power poles
			66 kV	168 power poles
			500 kV	1 transmission tower
Southern California Gas	Natural Gas	UG	4"	250 Linear Feet (LF)
Southern California Gas	Natural Gas	UG	12"	8,500 LF
AT&T	Telephone	UG	TBD	250 LF
	Fiber/Telecom	OH	TBD	12 power poles
Verizon	Fiber/Telecom	UG	TBD	80,400 LF
		OH	TBD	31 joint power poles
Time Warner	Fiber/Telecom	UG	TBD	200 LF
West Valley County Water District	Water Main	UG	12"	150 LF
Los Angeles Department of Water and Power	Water Line	UG	TBD	300 LF
Sundale Mutual Water Company	Water Line	UG	8”	5,240 LF
Land Projects Mutual Water Company	Water Line	UG	6”-8”	5,240 LF

Source: Relocation Impact Report, November 2015

Table 37: Utility Conflict Summary Alternative 2				
OWNER	**FACILITY TYPE**	**UNDER GROUND/ OVER HEAD (UG or OH)**	**SIZE**	**LENGTH or FACILITIES IDENTIFIED FOR RELOCATION**
Southern California Edison	Electric	OH	12 kV	154 power poles; 31 joint power poles
			66 kV	141 power poles
			500 kV	1 power pole
Southern California Gas	Natural Gas	UG	4"	250 Linear Feet (LF)
			12"	8,500 LF
AT&T	Telephone	UG	TBD	250 LF
	Fiber/Telecom	OH	TBD	12 power poles
Verizon	Fiber/Telecom	UG	TBD	100,100 LF
		OH	TBD	31 joint power poles
Time Warner	Fiber/Telecom	UG	TBD	200 LF
West Valley Water District	Water Main	UG	12"	120 LF
Los Angeles Department of Water and Power	Water Line	UG	TBD	300 LF
Sundale Mutual Water Company	Water Line	UG	8”	Sundale Mutual Water Company
Land Projects Mutual Water Company	Water Line	UG	6”-8”	Land Projects Mutual Water Company

Source: Relocation Impact Report, November 2015

All utility information within this report, including exact location and responsibility, would be verified with each corresponding utility agency during final design phase and prior to construction.

Emergency services are located on the western and eastern limits of the proposed project, but not within the immediate project area. The nearest hospitals are located in Lancaster. The proposed Centennial development in Tejon Ranch would include a Kaiser Permanente facility which should bring healthcare and emergency services closer to local residents.

Response times to emergency services could be expected to increase slightly during construction, however, Caltrans would coordinate with police, fire and medical services to ensure that these emergency services would be notified of construction updates. At least one lane would remain open in each direction during construction to provide emergency services for the duration of the project.

The nearest fire departments are located towards the western and eastern ends of the project limits in Gorman and Lancaster.

The nearest police/sheriff department would be the Lancaster and Santa Clarita Sheriff Stations. The towns of Neenach and Oso have proposed to use the currently closed Neenach Elementary School as a police substation and emergency shelter.

Medical: LA County Challenger Memorial Center located at 5300 W Ave I, Lancaster, CA 93536

Police: Los Angeles County Sheriff: Lancaster Station at 501 W Lancaster Blvd, Lancaster, CA 93534; Santa Clarita Valley Sherriff Station at 23740 W Magic Mountain Pkwy, Valencia, CA 91355

Fire: Los Angeles County Fire Station #77 in Gorman at 46833 Peace Valley Road, Gorman, CA 93243; Los Angeles County Fire Station #112 at 8812 W Ave E-8, Lancaster, CA 93536
With the proposed project improvements of Alternative 1 and 2, the corridor would be enhanced and emergency services could be expected to improve.

Avoidance, Minimization, and/or Mitigation Measures
Impacts to existing utility systems would be avoided or minimized to the extent feasible along the corridor. At locations where multiple constraints are present, however, the existing utility systems are proposed to be relocated. Examples of other constraints includes residences, businesses, solar farms and other private properties, section 4(f) properties, natural environmental resources, etc. The relocation work would be performed to reduce or minimize service disruptions in accordance with requirements from the utility owners. The project team has met with various utility owners affected by the project to understand their requirements and avoid or minimize the temporary impacts due to construction. Detailed relocation requirements would be developed in the final design phase when the preferred alternative is selected and the scope of relocation is defined.

Implementation of standard conditions of approval and close coordination with the utilities/emergency service providers would further minimize impacts to utilities and facilities. Because there would not be substantial impacts to utility systems or emergency services over the long term, no mitigation measures are required. The following avoidance measures would lessen the utility conflicts.

UT-1: Caltrans would coordinate with all affected private and public service utilities during the design stage to identify any potential conflicts with existing utilities. This process would include evaluation of ways to avoid utility relocations by refining the project design and/or protecting existing utilities in place. After seeking approval from utility providers, final relocation/protection in place measures would be incorporated into the final plans and specifications. Per Caltrans requirements, all linear underground utilities within Caltrans' ROW would be encased from ROW to ROW in either steel or concrete.

UT-2: All construction activities will adhere to LADWP's Standard Conditions for Construction.

UT-3: Caltrans would coordinate the proposed project work with the emergency service providers in the area. Contractors would work closely with the Antelope Valley and Newhall CHP areas to determine the best time for closures and detours if necessary. Utilizing CHP officers for traffic control (COZEEP), potential temporary speed reductions, and proper signage would be utilized as needed.

3.1.6 TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES
This section addresses the project's impacts on vehicular traffic and circulation, both during construction and after completion of the project. Impacts on the local roadway intersections, freeway main ramps

and connector ramps are addressed. The project's impacts on pedestrian and bicycle facilities are addressed in Bicycle Facilities and Pedestrian Facilities sections.

Regulatory Setting

The Department, as assigned by the Federal Highway Administration (FHWA), directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the American with Disabilities Act (ADA) requirements to Federal-aid projects, including Transportation Enhancement Activities.

Affected Environment

The Traffic and Transportation impact analysis in this section is based on the results from the *Traffic Analysis Report, Northwest 138 Corridor Improvement Project* prepared by Fehr and Peers (August, 2015). The traffic analysis study area consists of State Route (SR)-138 from Interstate I-5 to SR-14.

This analysis summarizes the characteristics of the existing roadway network in the study area, traffic volumes, truck traffic, and current operating conditions of the roadway network. Future traffic forecasts for Alternative 1 (Freeway/Expressway), and Alternative 2 (Expressway/Four-Lane Conventional Highway) and the No Build Alternative are presented in the Environmental Consequences section that follows.

Study Area and Existing Conditions

The study area is shown in Figure 18. For the purposes of producing traffic forecasts that reflect regional travel demands, the northern portion of Los Angeles County and southern portion of Kern County were included as part of the study vicinity. However, the traffic operations analysis and selected study locations are focused on SR-138 corridor from I-5 to SR-14.

For data collection purposes, 21 intersections and 14 roadway segments, including freeway mainlines and connector ramps, were identified as study count locations. Figure 19, SR-138 Count Locations, shows the study count locations for both intersections and roadway segments.

Figure 18 Study Area

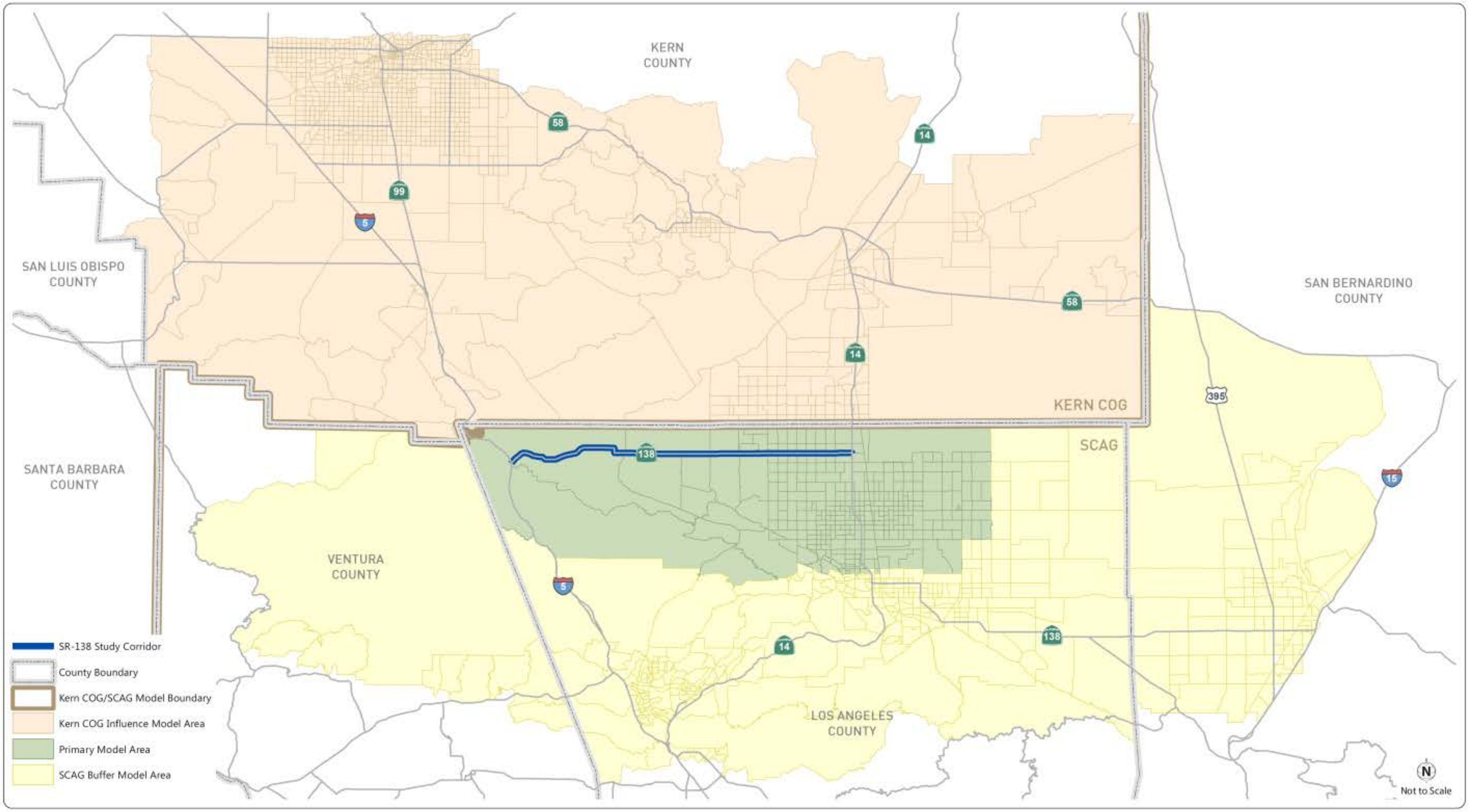


Figure 19 SR-138 Count Locations

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, June 2015

After reviewing the available models and considering the proximity of the study corridor to the edge of the Los Angeles County and Kern County boundary, the development of a Northwest 138 Sub-Area Model was identified as the preferred modeling approach. The Sub-Area Model better represents the study area, roadway network, and interactions between the two counties that would affect travel along the SR-138 corridor. The refined and fully integrated sub-area model reflects the socioeconomic projections and transportation network improvements contained in the Southern California Association of Governments (SCAG) 2035 Regional Transportation Plan and Kern Council of Governments (COG) Regional Transportation Plan models. It also reflects local land use and roadway network details from the Enhanced Antelope Valley Transportation Analysis Model (EAVTAM) model.

Preliminary Traffic Counts and Peak Hours Identification

As part of the data collection effort, an initial set of daily traffic counts along the SR-138 corridor was collected to determine the typical peak hours of traffic flow prior to the collection of peak hour intersection turning movement counts. As shown in Figure 20 Daily Traffic Flows on SR-138, the highest vehicular volume occurs in the afternoon around 3:30 PM followed by the morning peak of approximately 6:00 AM. As illustrated in this figure, there is a drop in vehicular volumes during the midday, with the lowest daytime volumes occurring between 11:00 AM and 12:00 PM.

Table 38: Study Intersections

Number	Intersection
1a.	SR-138 and Gorman Post Road Eastbound (E/B) Ramps
1b.	SR-138 and Gorman Post Road Westbound (W/B) Ramps
2a.	SR-138 and Private Road E/B Ramps
2b.	SR-138 and Private Road W/B Ramps
3a.	SR-138 and 300th Street West E/B Ramps
3b.	SR-138 and 300th Street West W/B Ramps
4.	SR-138 and Margalo Drive
5.	SR-138 and Three Points Road
6.	SR-138 and 250th Street West
7.	SR-138 and 245th Street West
8.	SR-138 and 240th Street West
9.	SR-138 and 230th Street West
10.	SR-138 and 210th Street West
11.	SR-138 and 190th Street West
12.	SR-138 and 170th Street West
13.	SR-138 and 150th Street West
14.	SR-138 and 140th Street West
15.	SR-138 and 130th Street West
16.	SR-138 and 110th Street West
17.	SR-138 and Loop Road West
18.	SR-138 and 90th Street West
19.	SR-138 and Loop Road East
20.	SR-138 and 60th Street West
21.	SR-138 and 40th Street West
22.	SR-138 and 30th Street West
23.	SR-138 and SR-14 Southbound off-ramp
24.	SR-138 and SR-14 Northbound off-ramp

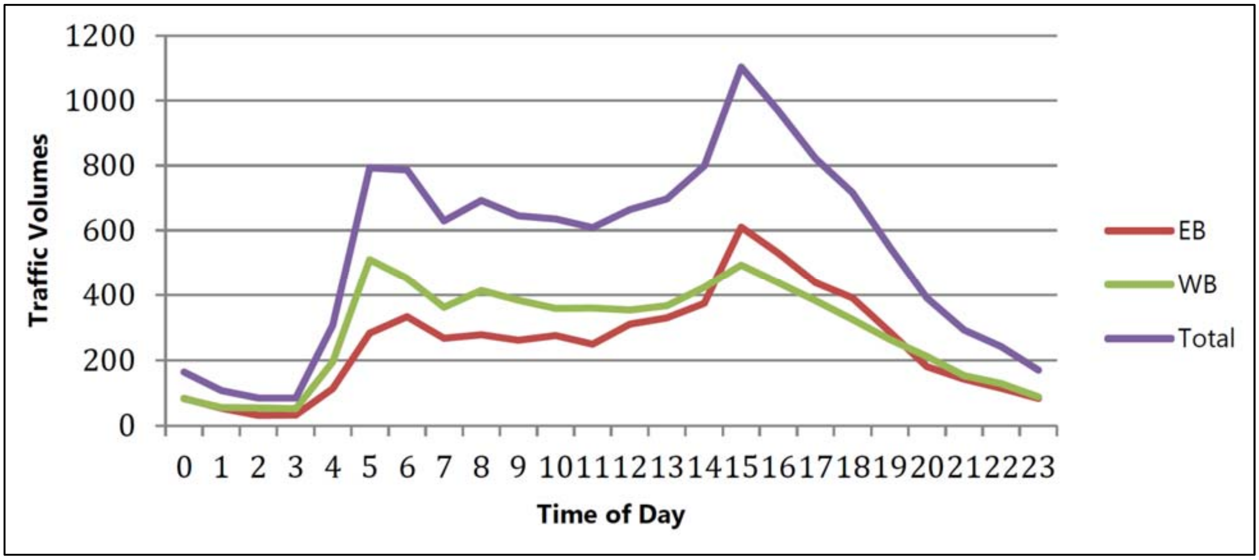
Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Table 39: Study Roadway Segments

ID	Segment
I-5	
1	Connector from N/B I-5 to E/B SR-138
2	Connector from S/B I-5 to E/B SR-138
SR-138/Lancaster Road	
3	Connector from W/B SR-138 to N/B I-5
4	Connector from W/B SR-138 to S/B I-5
5	East of Gorman Post Road
6	Between Gorman Post Road and Old Ridge Route
7	Between Old Ridge Route and 300th Street West
SR-138/W Avenue C-6	
8	Between 280th Street West and 270th Street West
SR-138/270th Street W	
9	Between Three Points Road and 245th Street West
SR-138/W Avenue D	
10	Between 230th Street West and 190th Street West
11	Between 190th Street West and 130th Street West
12	Between 130th Street West and 80th Street West
13	Between 80th Street West and 30th Street West
14	East of SR-14

Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Figure 20 Daily Traffic Flow on SR-138



Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Existing Traffic Volumes and Levels of Service

The traffic operations analysis for the project addresses intersection and highway operations. The intersection operations analyses were conducted using procedures and methodologies consistent with the Highway Capacity Manual (HCM) 2010 (Transportation Research Board, 2010). Highway facilities were also analyzed using HCM 2010 procedures and methodologies. The intersection methodology was applied using the Synchro 8 traffic analysis software, and the highway analysis was completed using HCS 2010 (Highway Capacity Software version 2010).

The traffic analysis results include a descriptive term known as level of service (LOS). LOS is a measure of traffic operating conditions from a driver's perspective, which varies from LOS A (the best) to LOS F (the worst).

Existing Intersections Levels of Service

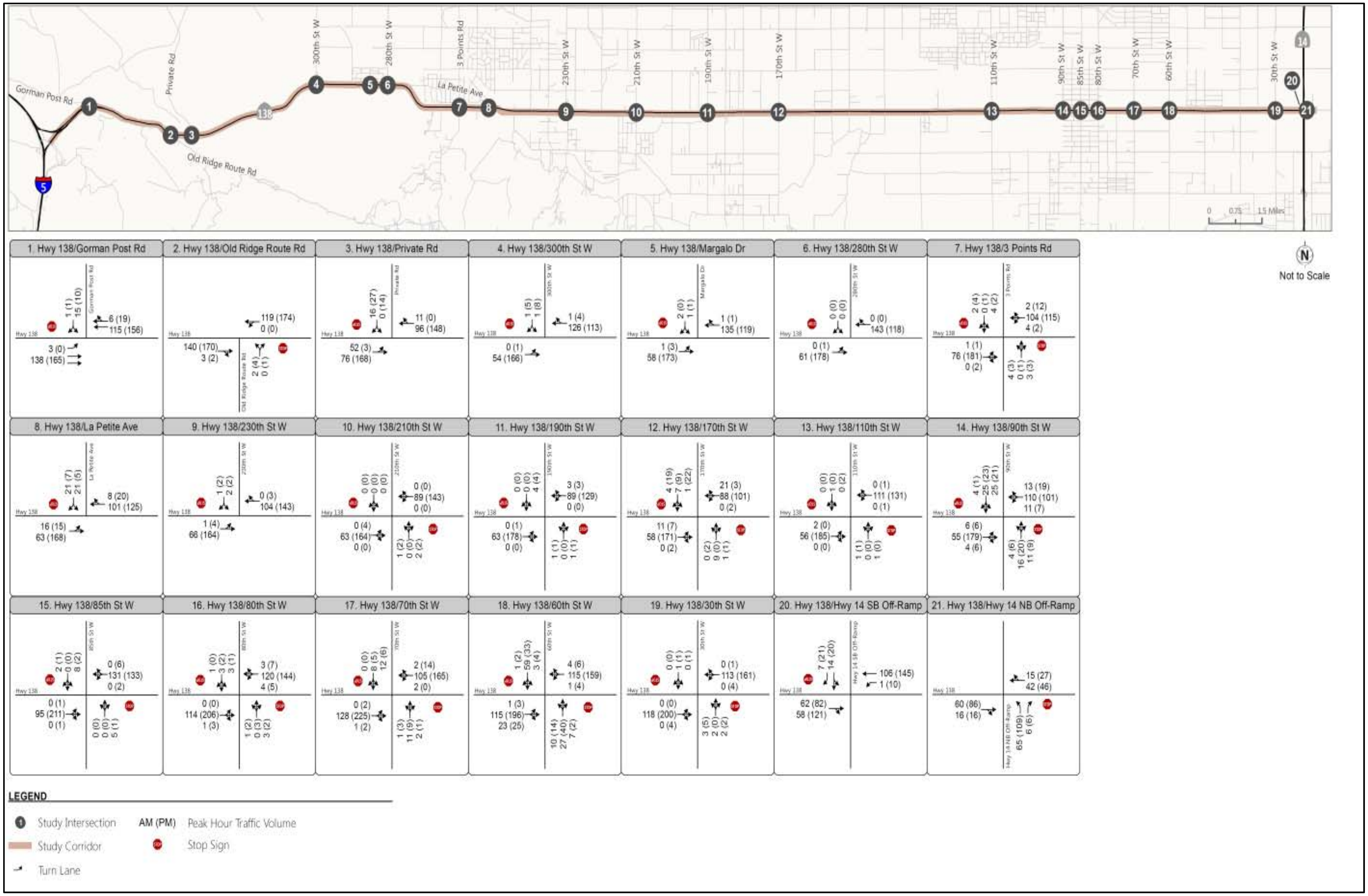
A traffic operations analysis was performed for existing conditions under AM and PM peak hour conditions. Table 40, Intersection LOS Existing Conditions, shows the LOS and delay for the worst-case movement at the study intersections under existing conditions. All of the study intersections currently operate at LOS B or better during the AM and PM peak periods under existing conditions. Figure 21 shows peak hour traffic volumes.

Table 40: Intersection LOS Existing Conditions

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay (in seconds)*	LOS	Delay (in seconds)*	LOS
1. SR-138 & Gorman Post Road	TWSC	9.9	A	10.3	B
2. SR-138 & Old Ridge Route Road	TWSC	10.4	B	10.5	B
3. SR-138 & Private Road	TWSC	9.1	A	10.3	B
4. SR-138 & 300th Street West	TWSC	9.3	A	9.9	A
5. SR-138 & Margalo Drive	TWSC	9.2	A	10.4	B
6. SR-138 & 280th Street West	TWSC	0.0	A	0.0	A
7. SR-138 & 3 Points Road	TWSC	9.8	A	10.4	B
8. SR-138 & La Petite Avenue	TWSC	9.8	A	9.7	A
9. SR-138 & 230th Street West	TWSC	9.3	A	9.8	A
10. SR-138 & 210th Street West	TWSC	9.1	A	10.0	B
11. SR-138 & 190th Street West	TWSC	9.8	A	11.5	B
12. SR-138 & 170th Street West	TWSC	10.6	B	10.6	B
13. SR-138 & 110th Street West	TWSC	10.3	B	10.8	B
14. SR-138 & 90th Street West	TWSC	11.0	B	12.3	B
15. SR-138 & 85th Street West	TWSC	10.2	B	10.8	B
16. SR-138 & 80th Street West	TWSC	10.3	B	11.4	B
17. SR-138 & 70th Street West	TWSC	10.6	B	12.1	B
18. SR-138 & 60th Street West	TWSC	11.3	B	12.7	B
19. SR-138 & 30th Street West	TWSC	10.5	B	11.6	B
20. SR-138 & SR-14 S/B off-ramp	TWSC	10.1	B	10.9	B
21. SR-138 & SR-14 N/B off-ramp	TWSC	10.2	B	11.0	B
Note: *indicates worst approach delay per the HCM 2010 methodology. Source: Kimley-Horn and Associates, Inc. 2014. TWSC = Two-way stop control					

Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Figure 21 Peak Hour Traffic Volumes Existing Conditions



Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Existing Highway Operations

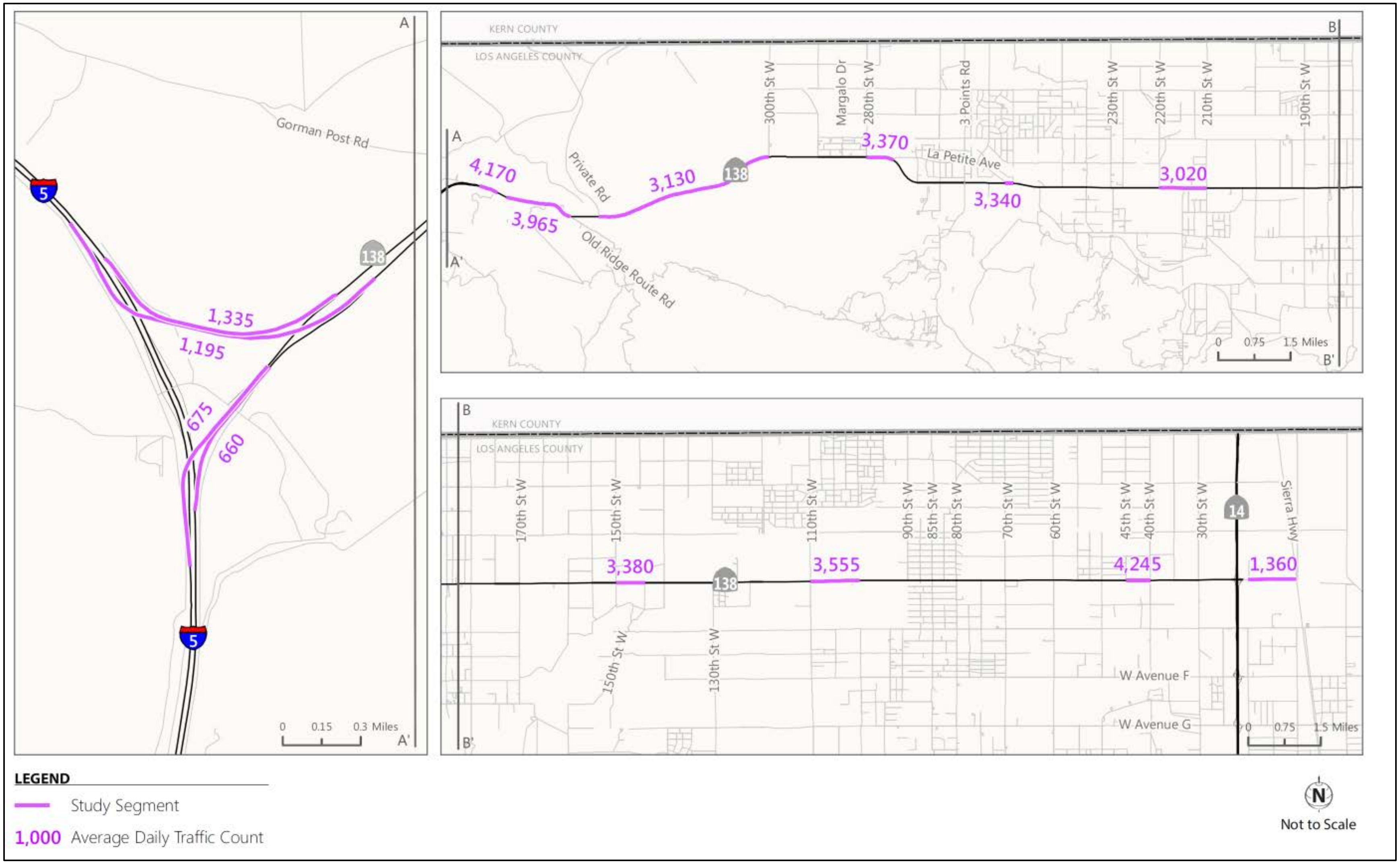
Traffic operations for the two-lane highway segment analysis are provided in Table 41, SR-138 LOS for Highways Existing Conditions. SR-138 currently operates at LOS B or better for both the AM and PM peak hours. Figure 22, Daily Roadway Volumes Existing Conditions, shows the daily roadway volumes for existing conditions.

Table 41: SR-138 LOS for Highways Existing Conditions

SR-138 SEGMENT	PEAK Hour LOS	
	AM	PM
1- I-5 Connector to Gorman Post Road	A	B
2-Gorman Post Road to Old Ridge Route	A	B
3-Old Ridge Route to 300th Street West	A	B
4-280th Street West to 270th Street West	A	B
5-Three Points Road to 245th Street West	A	B
6-230th Street West to 190th Street West	A	B
7-190th Street West to 130th Street West	B	B
8-130th Street West to 80th Street West	B	B
9-80th Street West to 30th Street West	B	B
10-30th Street West to SR-14	A	A

Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Figure 22 Daily Roadway Volumes Existing Conditions



Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

Traffic Accident Data

The data below in Tables 42 through Table 44 summarize the traffic collision data compiled by Caltrans' Traffic Accident Surveillance and Analysis System (TASAS) for the highway sections on SR-138. The data shown is for the three-year period between April 1, 2009 and March 31, 2012, which is the most recent information available. Within the study area, 119 collisions occurred in the three-year period. The TASAS summary was divided into three sections according to type of highway facility.

Table 42: Collision History from SR-138 PM 0.0 TO PM 36.956

Location	Number of Accidents				Actual Collision Rate[1]			Statewide Collision Rate[1]		
	Total	Fatality	Injury	Fatality + Injury	Fatality + Injury	Fatality + Injury	Total	Fatality	Fatality + Injury	Total
SR-138 Mainline PM 0.0 – 1.391 R	1	0	0	0	0.000	0.00	0.39	0.023	0.28	0.61
SR-138 Mainline PM 0.0 – 1.246 L	0	0	0	0	0.000	0.00	0.00	0.018	0.22	0.50
SR-138 Mainline PM 1.392 – 39.956	118	6	52	58	0.046	0.44	0.89	0.023	0.44	0.96

Notes: [1.] The accident rate is accidents per million vehicle-miles.

Source: Caltrans District 7 TASAS Table B, April 1, 2009 to March 31, 2012.

There are five locations with multiple accidents:

1.) PM 1.34 to PM 9.76 - 51 accidents (43% of total accidents) occurred on this 8.5 mile stretch of SR-138 between I-5 and 300th Street West.
  - o The most common cause was improper turning, followed by speeding and driving under the influence of drugs or alcohol.
  - o Most common type of accident was hit object followed by sideswipe and head-on.
  - o There was one fatal accident at PM 5.28 with two fatalities and 12 injured.
  - o No pedestrians were injured.

2.) 245th Street West(PM 14.52 to PM 14.534) – three accidents
  - o There were two fatalities in two accidents.
  - o Most common result was speeding.
  - o There was one head on, one hit object and one rear end.
  - o No pedestrians were injured.

3.) 90th Street West intersection (PM 30.075) – seven accidents
  - o The most common result was failure to yield followed by speeding.
  - o There were four broadsides, two rear ends and one sideswipe.
  - o No fatalities occurred.
  - o No pedestrians were injured.

4.) 60th Street West intersection (PM 33.075) – seven accidents
  - o The most common result was failure to yield followed by other vehicle code violations
  - o All of the accidents were broadside.
  - o There was one fatality.

- No pedestrians were injured.

5.) PM 36.795 to PM 36.810 (SR-14 SB Off/On-Ramp Intersection) – four accidents, of which three occurred at the intersection
   - Most common result was improper turn.
   - There were two broadsides and two sideswipes.
   - No pedestrians were injured.

Table 43: Collision History from I-5 Off-Ramps to Eastbound SR-138

Location	Number of Accidents				Actual Collision Rate[1]			Average Collision Rate[1]		
	Total	Fatality	Injury	Fatality + Injury	Fatality	Fatality + Injury	Total	Fatality	Fatality + Injury	Total
I-5 SB off-ramp to EB SR-138 (I-5 PM 82.397)	2	0	1	1	0.000	0.68	1.35	0.006	0.25	0.77

Notes: [1.] The accident rate is accidents per million vehicle-miles.
Rate. Total number of accidents includes non-injury accidents, which are not included in the table.
Source: Caltrans District 7 TASAS Table B, April 1, 2009 to March 31, 2012.

- Two accidents occurred, both were a result of speeding. Of those, one had an injury and no fatalities occurred.
- There was one overturn and one hit object.
- The actual rate of total amount of accidents and accidents with fatalities and injuries is twice as much as state average.

Table 44: Collision History from I-5 On-Ramps from Westbound SR-138

Location	Number of Accidents				Actual Collision Rate[1]			Average Collision Rate[1]		
	Total	Fatality	Injury	Fatality + Injury	Fatality + Injury	Fatality + Injury	Total	Fatality	Fatality + Injury	Total
I-5 NB on-ramp from WB SR-138 (I-5 PM 82.265)	0	0	0	0	0.000	0.00	0.00	0.002	0.10	0.29

Notes: [1.] The accident rate is accidents per million vehicle-miles.
Injury rate. Total number of accidents includes non-injury accidents, which are not included in the table.

Source: Caltrans District 7 TASAS Table B, April 1, 2009 to March 31, 2012.

Alternate Modes of Transportation

Antelope Valley Local Transit

The Antelope Valley Transit Authority was created in 1992 by Los Angeles County and the cities of Lancaster and Palmdale to provide transit service to residents of Antelope Valley communities. The Antelope Valley Transit Authority provides three services: local fixed-route buses (including school routes), on-demand “Dial-A-Ride” paratransit vehicles, and longer distance commuter coach service.

Public transportation services revolve around the Palmdale Transportation Center as the major transfer center in Palmdale and Lancaster City Park as the major transfer center in Lancaster. The Antelope Valley Transit Authority's local bus service operates five bus routes within the Antelope Valley area from East Avenue P, Technology Drive, Sierra Highway, and Carriage Way to Palmdale Transportation Center. Local bus service is not provided along this stretch of SR-138; local buses serve the Lancaster area.

Commuter Bus

The Antelope Valley Transit Authority provides commuter bus service to Los Angeles and the San Fernando Valley. Commuter bus routes serve three locations from Palmdale Transportation Center, including Downtown Los Angeles, West Los Angeles, and West San Fernando Valley.

Commuter Rail

Metrolink Commuter Rail service is available from the Antelope Valley to Santa Clarita, the San Fernando Valley, and Los Angeles Basin cities on the Antelope Valley Line, Monday through Saturday.

Bicycle Facilities

The Highway Design Manual, California Department of Transportation (Caltrans), 2012, classifies bikeways into three categories:

Class I Multi-Use Path: A completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
Class II Bike Lane: A striped and signed lane for one-way bike travel on a street or highway.
Class III Bike Route: Signing only for shared use with motor vehicles within the same travel lane on a street or highway.

The Los Angeles County Bicycle Master Plan map does not identify existing or proposed bike trails along SR-138. However, the Bicycle Master Plan does identify several proposed north-south and east-west Class III Bike Trails within Antelope Valley just south of SR-138. Within the immediate project area, a proposed Class III Bike Route would run north-south along Ridge Route Road, connecting SR-138 and Ridge Route Road at Quail Lake. The new proposed alignment would provide further continuity with the bike trails and provide cyclists access to new County trails within Antelope Valley in the region south of SR-138.

Pedestrian Facilities

In general, pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. The project's pedestrian safety features include five new grade separation structures (standard Box Culverts) that are proposed to accommodate bicycle, recreational use, and maintenance access across the SR-138 at the following locations: Quail Lake near the private airport, 269th Street West (existing Pacific Crest Trail crossing), east of Three Points Road, the California Aqueduct crossing near 245th Street West. All pedestrian features associated with the project would require compliance with ADA regulations and design guidelines.

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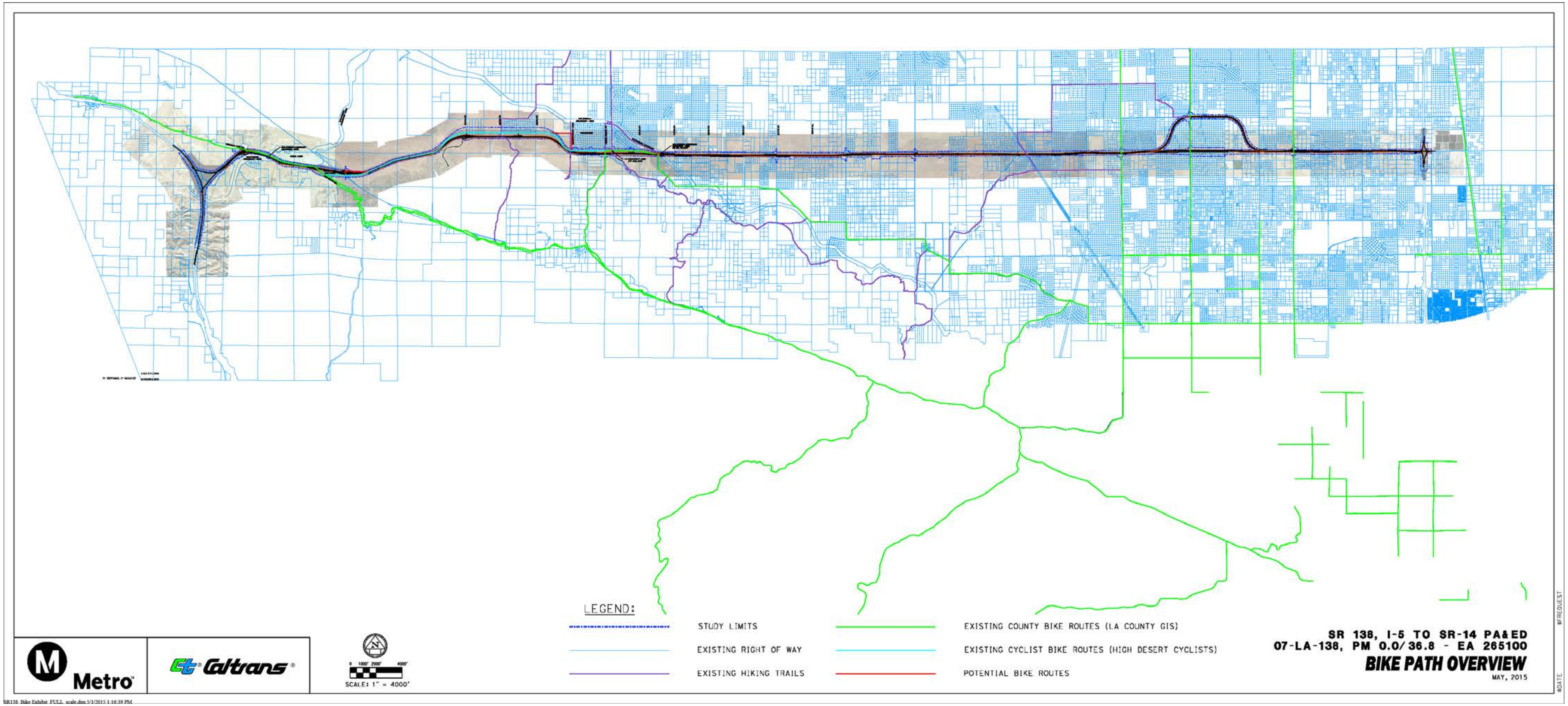
Figure 23 Existing and Proposed Bicycle Facilities



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Americans With Disabilities Act (ADA)
One of Caltrans' goals is to maximize transportation system performance and accessibility. In support of this goal, Caltrans created the ADA Infrastructure Program under its Maintenance and Operations Program. The objective of the ADA Infrastructure Program is to make Caltrans infrastructure equally accessible to persons with disabilities. Caltrans is committed to working with its partners to identify and address access barriers to its infrastructure. In accordance with Title II of the Americans with Disabilities Act of 1990, Caltrans has designated a Statewide ADA Coordinator who is responsible to coordinate ADA compliance across the State and has established a website where access barriers can be reported. During design and construction of the project, all applicable ADA design features related to the provision or modifications of ADA sidewalks, curbs, ramps and roads would be implemented. Therefore, the project would be in compliance with state code and federal guidelines related to the ADA.

Parking Facilities
The project includes road improvements to SR-138 between I-5 and SR-14. These road improvements would not increase the demand for vehicle parking or displace existing parking facilities along SR-138. An existing Caltrans park-and-ride lot, which is not part of the project, is located in the City of Lancaster approximately seven miles south of SR-14 and SR-138 intersection. Parking is free and can accommodate up to 118 vehicles; the lot provides five disabled parking and multiple bicycle racks.

Environmental Consequences
This section discusses the potential environmental consequences of three Alternatives: the No Build Alternative, Alternative 1-Freeway/Expressway, and Alternative 2- Expressway/Four-Lane Conventional Highway, under opening year (2020/2025) and the 20-year design life (2040) of the project. The traffic conditions for the future years are also compared against the baseline 2013 conditions.

Depending on the level of investment needed to implement the improvements proposed under each alternative, the project's opening year was estimated to be Year 2020 or 2025, as follows:

- No Build Alternative - Year 2020
- Alternative 1 (Freeway/Expressway) - Year 2025
- Alternative 2 (Expressway and Four-Lane Conventional Highway)- Year 2025

Circulation Improvements
The existing Northwest SR-138 is a 2-lane rural highway that contributes to the local circulation network and provides an alternate route for west-east traffic in northwest (NW) Los Angeles County. The NW SR-138 Corridor Improvement Project (project) would widen SR-138 and provide operational and safety improvements. The proposed circulation improvements for Alternatives 1 and 2 include:

- On northbound I-5 approaching the SR-138 interchange, it is proposed to add a 1,300-foot deceleration lane prior to the proposed two-lane exit to SR-138. Approximately 1 mile to the north where SR-138 merges with I-5 north, a 2,500-foot acceleration lane is proposed. On southbound I-5 approaching the interchange, it is proposed to add a 1,300-foot deceleration lane prior to the proposed two-lane exit to SR-138. Approximately 1 mile to the south where SR-138 merges with I-5 south, a 3,500-foot acceleration lane is proposed.

- Improvements to the SR-138/SR-14 interchange to improve connections to the existing ramps.

- Use of the existing roadway as a local frontage road to provide local circulation or to maintain current parcel access. The existing highway would be relinquished to the County as a local roadway in these areas.

- Proposed interchange and overcrossing at Gorman Post Road on SR-138. Alternative 1 also proposes new interchanges and undercrossings at Cement Plant Road and 300th Street West.

- Multiple access and treatment options at at-grade intersections would be considered to enhance operational efficiencies.

- Existing bicycle and pedestrian facilities would be maintained and/or enhanced. The existing bicycle routes south of SR-138 and east of 245th Street West would continue to be utilized. These routes follow parallel County Roads. Between 300th Street West and 245th Street West, bicycle access would be provided by the existing SR-138 roadway which would be replaced by the new alignment to the south. Further west, the new access road proposed along the overhead utility corridor between the Cement Plant Road and 300th Street West would accommodate bicycle access. To maintain the continuity of the bike routes within the western project limits, a bicycle path is proposed along the access road between the highway and Quail Lake outside of Caltrans right-of-way. Class I Multi-Use Paths constructed as part of the project would be required to conform with Title III of the Americans with Disabilities Act (ADA), which requires paved multi-use paths for use by the general public be designed in a manner that ensures they are built to transportation standards and are accessible to all users.

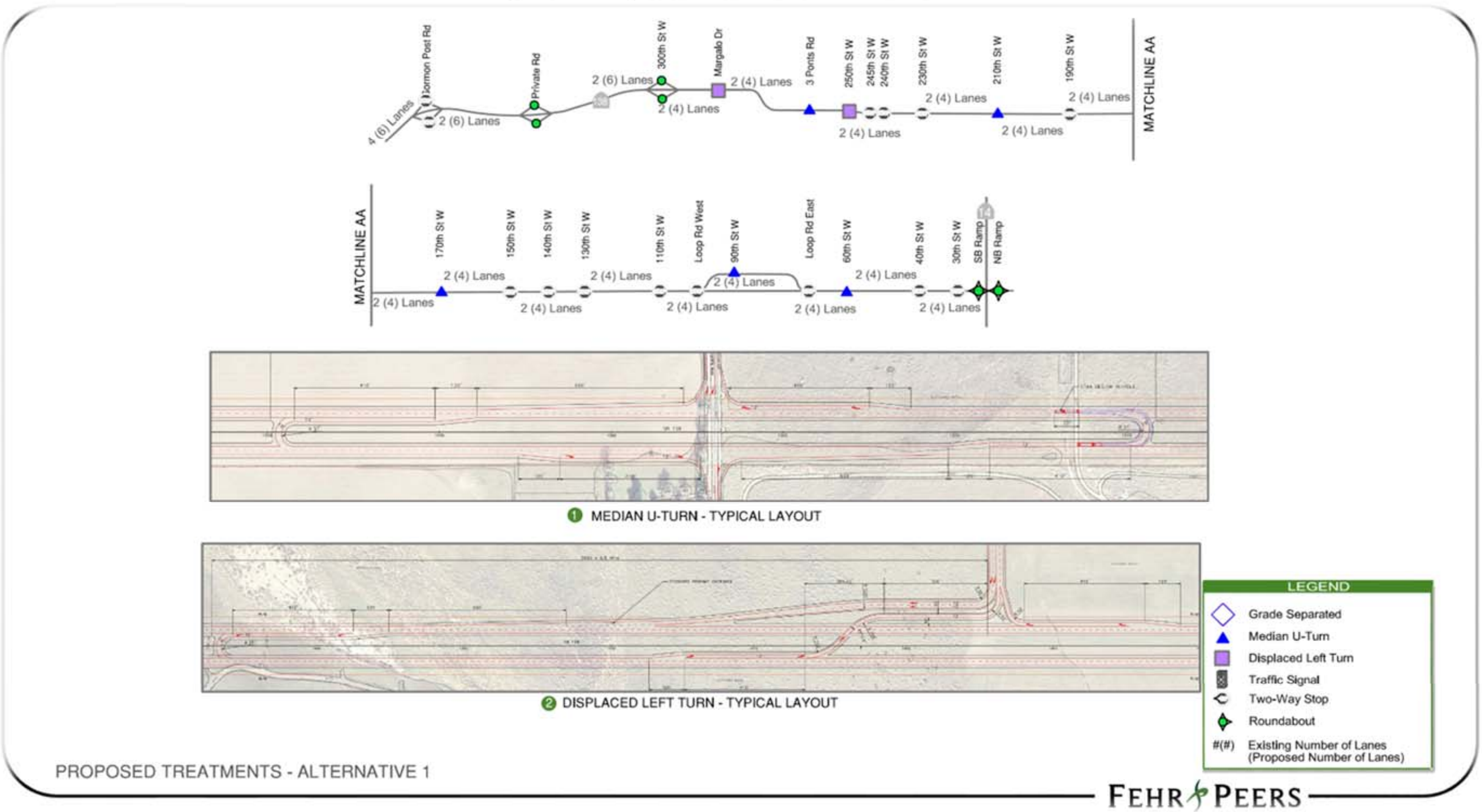
Safety Enhancements

Based on the collision analysis from the Traffic Accident Surveillance and Analysis System (TASAS) data from April 2009 to March 31, 2012 (which is the most recent data available), the following data was gathered.

On the SR-138 mainline, the primary cause of accidents on the corridor were improper turning (45.4%), speeding (21.8%), and other violations (14.3%). Proposed improvements (for both Build Alternatives) such as a standard clear recovery zone (which is an area clear of fixed objects adjacent to the traveled way), curve corrections, grade- separated interchanges, enhanced channelization at intersections, corridor widening, and standard shoulder widths are anticipated to lower the rate of accidents along the corridor.

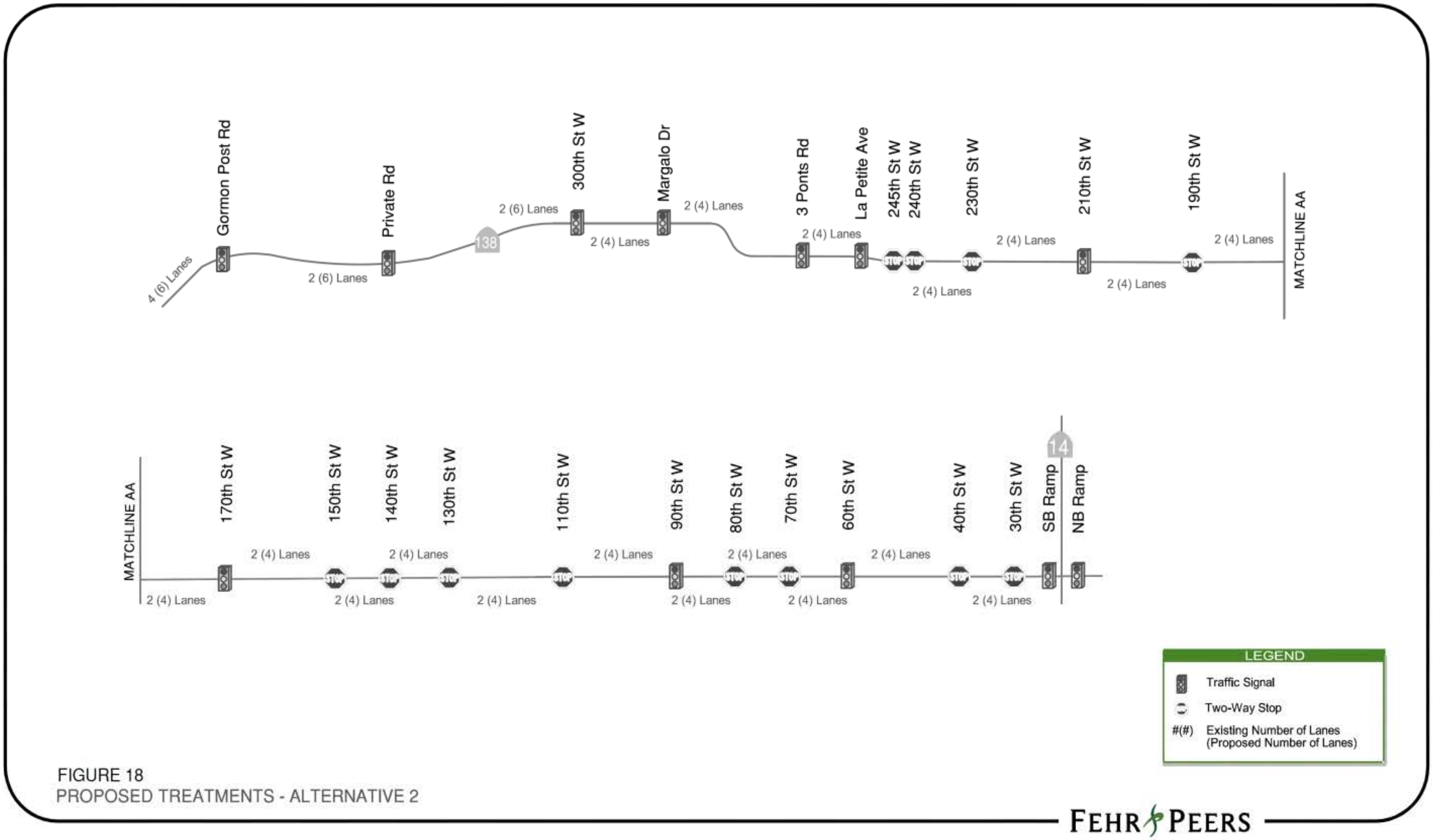
Table 42 indicates the type and severity of accidents on the SR-138 mainline. Statewide averages for similar facilities are also provided for comparison purposes. Of the 119 accidents, six involved fatalities and three of those were head-on collisions and the causes of these accidents were improper turning, speeding, and failure to yield. The proposed median for Alternatives 1 and 2 is expected to reduce the likelihood of head-on collisions. Although the total accident rate over the three year period was slightly lower than the statewide average for a freeway with similar characteristics, the rate of fatal accidents is twice that of the statewide average. These design features of Alternatives 1 and 2 are expected to enhance the safety of the corridor.

Figure 24 Proposed Treatments Alternative 1



Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

Figure 25 Proposed Treatments Alternative 2



Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

Comparison of Alternatives
Figures 26 and 27 provide a visual overview of Build Alternatives 1 and 2. Table 45 provides a comparison of No Build Alternative, Alternative 1 (Freeway/Expressway), and Alternative 2 (Expressway and Four -Lane Conventional Highway).

In compliance with Caltrans Policy, an Intersection Control Evaluation (ICE) Report was prepared and attached to the NW 138 Corridor Improvement Project Transportation Analysis Report. The ICE Report analyzed all viable intersection control treatments for every listed intersection within the project limits. Caltrans reserves the right to determine its preferred intersection control based on traffic and safety data at the time the improvements occur.

<u>Year 2020/2025 Conditions</u>
This section discusses the potential environmental consequences of all three alternatives under opening year (2020/2025) conditions.

Intersection Volumes and Levels of Service 2020/2025
Table 46 displays the Average Daily Traffic (ADT) forecasts under 2020/2025 opening year conditions. ADT and peak hour forecasts for No Build Alternative, Alternative 1, and Alternative 2.

<u>No Build Alternative Intersection LOS, Year 2020/2025</u>
Table 47, Intersection LOS 2020 No Build shows the No Build AM and PM peak hour delay and LOS for the study intersections under 2020 conditions.

Under the No Build Alternative, 16 intersections are forecasted to operate at LOS B and five intersections are forecasted to operate at LOS C during the AM peak hour. During the PM peak hour, 14 intersections are forecasted to operate at LOS B, six intersections are forecasted to operate at LOS C, and one intersection – SR-138 & 3 Points Road – is forecasted to operate at LOS D.

Figure 26 Overview of Build Alternative 1

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, June 2015

Figure 27 Overview of Build Alternative 2

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, June 2015

Table 45: Summary Comparison of Alternatives

Design Feature	No Build Alternative	Build Alternative 1 (Freeway/ Expressway)	Build Alternative 1 with Antelope Acres Bypass	Build Alternative 2 (Expressway/ Four-Lane Conventional Highway)
Type of Facility	2-lane conventional highway	6-lane Freeway to 300th Street West ; 4-lane Expressway to SR-14	6-lane Freeway to 300th Street West; 4-lane Expressway to SR-14. The bypass alignment would begin to deviate from the existing SR-138 near 100th Street West and would continue northeast direction towards West Avenue C. After paralleling West Avenue C for approximately 1.0 mile, the alignment would continue southeasterly back towards the existing SR-138, and eventually join the existing SR-138 near 70th Street West.	6-lane Expressway to 300th Street West; 4-lane Expressway to 240th Street West/4 lane limited access conventional highway to SR-14
Access	Multiple access location, driveways, field roads, county roads	Interchanges along Freeway; Median U- Turns, Displaced Left-Turns, Two-Way Stop Controlled, Roundabouts	Same as Alternative 1	Traffic Signals; Two-Way Stop Control
Median Widths	N/A	Varies 22 to 86 feet	Same as Alternative 1	Varies 0 to 86 feet

In compliance with Caltrans Policy, an Intersection Control Evaluation (ICE) Report was prepared that analyzed all viable intersection control treatments for every listed intersection within the project limits. Caltrans reserves the right to determine its preferred intersection control based on traffic and safety data at the time the improvements occur.

Table 46: 2020/2025 ADT Volumes & Forecasts

ID	Location	2012 Subarea Model	2020 Subarea No Build Alternative	2025 Subarea Alternative 1 Scenario	2025 Subarea Alternative 2 Scenario
1	I-5 North of SR138	70,600	81,000	94,500	93,700
2	I-5 South of SR138	67,900	82,000	93,600	93,600
3	I-5 NB Off-Ramp to SR-138	600	3,610	9,760	9,570
4	I-5 NB On-Ramp to SR-138	1,335	3,645	7,960	7,820
5	I-5 SB Off-ramp to SR-138	1,195	3,040	6,920	6,800
6	I-5 SB On-Ramp to SR-138	675	3,690	10,550	10,350
7	SR-138 East of I-5	4,500	13,900	35,200	34,300
8	SR-138 West of 300th Street West	4,500	11,200	32,900	31,900
9	SR-138 West of 245th Street West	4,000	9,100	26,500	25,700
10	SR-138 West of 190th Street West	3,500	7,100	23,400	22,400
11	SR-138 West of 110th Street West	3,700	7,500	22,400	21,300
12	SR-138 West of 60th Street West	3,800	7,400	20,800	19,200
13	SR-138 West of SR-14	3,800	7,200	19,500	18,000
14	SR-14 North of SR-138	44,300	49,500	49,800	50,500
15	SR-14 South of SR-138	46,400	51,600	56,100	56,000

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

Table 47: Intersection LOS 2020 No Build Alternative

Intersection	Traffic Control	2020 No Build			
		AM Peak Hour		PM Peak Hour	
		Delay (in seconds)	LOS	Delay (in seconds)	LOS
1. SR-138 & Gorman Post Road	TWSC[2]	16.8	C	15.5	C
2. SR-138 & Old Ridge Route Rd	TWSC[2]	20.4	C	17.0	C
3. SR-138 & Private Rd	TWSC[2]	14.6	B	14.9	B
4. SR-138 & 300th St West	TWSC[2]	10.8	B	11.4	B
5. SR-138 & Margalo Dr	TWSC[2]	10.0	B	10.6	B
6. SR-138 & 280th St West	TWSC[2]	11.2	B	12.2	B
7. SR-138 & 3 Points Rd	TWSC[2]	22.0	C	34.6	D
8. SR-138 & La Petite Ave	TWSC[2]	14.3	B	13.2	B
9. SR-138 & 230th St West	TWSC[2]	11.1	B	11.5	B
10. SR-138 & 210th St West	TWSC[2]	13.4	B	13.9	B
11. SR-138 & 190th St West	TWSC[2]	12.8	B	15.1	C
12. SR-138 & 170th St West	TWSC[2]	15.8	C	14.8	B
13. SR-138 & 110th St West	TWSC[2]	13.4	B	14.0	B
14. SR-138 & 90th St West	TWSC[2]	15.6	C	18.5	C
15. SR-138 & 85th St West	TWSC[2]	13.1	B	15.1	C
16. SR-138 & 80th St West	TWSC[2]	12.5	B	14.5	B
17. SR-138 & 70th St West	TWSC[2]	13.2	B	14.5	B
18. SR-138 & 60th St West	TWSC[2]	14.6	B	17.4	C
19. SR-138 & 30th St West	TWSC[2]	12.1	B	13.8	B
20. SR-138 & Hwy 14 SB Off- Ramp	TWSC[2]	10.1	B	11.5	B
21. SR-138 & Hwy 14 NB Off-Ramp	TWSC[2]	10.4	B	11.9	B

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

Alternative 1 (Freeway/ Expressway) Intersection LOS Year 2020/2025

Tables 48 and 49 shows Alternative 1 (Freeway/Expressway) AM and PM peak hour delay and LOS for the study intersections under 2025 conditions.

Table 48: Intersection LOS 2025 Alternative 1

No.	Intersection	2025 Alternative 1				
		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (in seconds) [1]	LOS	Delay (in seconds) [1]	LOS
1a.	SR-138 & Gorman Post Road EB Ramps[2]	TWSC[3]	11.4	B	11.7	B
1b.	SR-138 & Gorman Post Rd WB Ramps[2]	TWSC[3]	9.2	A	10.6	B
2a.	SR-138 & Private Rd EB Ramps[2]	Signal	4.8	A	5.8	A
2b.	SR-138 & Private Rd WB Ramps[2]	Signal	5.0	A	4.7	A
3a.	SR-138 & 300th St W EB Ramps[2]	Signal	6.6	A	8.3	A
3b.	SR-138 & 300th St W WB Ramps[2]	Signal	3.1	A	3.5	A
4.	SR-138 & Margalo Dr	Displaced Left (Free-flow)				
5.	SR-138 & 3 Points Rd	Median U-turn (Free-flow)				
6.	SR-138 & 250th St West	Displaced Left (Free flow)				
7.	SR-138 & 245th St West	TWSC[3]	12.4	B	13.0	B
8.	SR-138 & 240th St West	TWSC[3]	12.4	B	13.0	B
9.	SR-138 & 230th St West	TWSC[3]	12.5	B	13.0	B
10.	SR-138 & 210th St West	Median U-turn (Free-flow)				
11.	SR-138 & 190th St West	TWSC[3]	12.1	B	12.3	B
12.	SR-138 & 170th St West	Median U-turn (Free-flow)				
13.	SR-138 & 150th St West	TWSC[3]	11.8	B	11.9	B
14.	SR-138 & 140th St West	TWSC[3]	11.9	B	11.9	B
15.	SR-138 & 130th St West	TWSC[3]	11.8	B	12.0	B
16.	SR-138 & 110th St West	TWSC[3]	11.7	B	12.1	B
17.	SR-138 & Loop Rd West	TWSC[3]	10.6	B	10.9	B
18.	SR-138 & 90th St West	Median U-turn (Free-flow)				
19.	SR-138 & Loop Rd East	TWSC[3]	23.3	C	18.0	C
20.	SR-138 & 60th St West	Median U-turn (Free-flow)				
21.	SR-138 & 40th St West	TWSC[3]	10.9	B	11.2	B
22.	SR-138 & 30th St West	TWSC[3]	10.8	B	11.2	B
23.	SR-138 & Hwy 14 SB Off-Ramp	Roundabout	6.1	A	6.5	A
24.	SR-138 & Hwy 14 NB Off-Ramp	Roundabout	8.0	A	9.7	A

Source: Kimley-Horn and Associates, Inc.; 2014; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
2. Grade Separated from SR-138.
3. TWSC = Two-way stop control.

Table 49: Intersection LOS 2025 Alternative 1 (Intersection Delay)

Intersection		Traffic Control	AM Peak Hour				PM Peak Hour			
			App. Delay (sec)	LOS	Int. Delay	LOS	App. Delay (sec)	LOS	Int. Delay	LOS
1a.	SR-138 & Gorman Post Road EB Ramps	Two-way Stop	11.4	B	9.3	A	11.7	B	10.8	B
1b.	SR-138 & Gorman Post Road WB Ramps	Two-way Stop	9.2	A	1.2	A	10.6	B	2.3	A
2a.	SR-138 & Private Rd Road EB Ramps	Signalized	5.7	A	4.8	A	6.8	A	5.8	A
2b.	SR-138 & Private Rd Road WB Ramps	Signalized	8.2	A	5.0	A	6.0	A	4.7	A
3a.	SR-138 & 300th St W EB Ramps	Signalized	9.3	A	6.6	A	10.6	B	8.3	A
3b.	SR-138 & 300th St W WB Ramps	Signalized	4.8	A	3.1	A	4.9	A	3.5	A
4.	SR-138 & Margalo Dr	Displaced Left (Free-flow)								
5.	SR-138 & 3 Points Rd	Median U-turn (Free-flow)								
6.	SR-138 & 250th St West	Displaced Left (Free flow)								
7.	SR-138 & 245th St West	Two-way Stop	12.6	B	0.1	A	13.4	B	0.1	A
8.	SR-138 & 240th St West	Two-way Stop	12.6	B	0.1	A	13.5	B	0.1	A
9.	SR-138 & 230th St West	Two-way Stop	12.7	B	0.3	A	13.4	B	0.5	A
10.	SR-138 & 210th St West	Median U-turn (Free-flow)								
11.	SR-138 & 190th St West	Two-way Stop	12.3	B	0.2	A	12.7	B	0.1	A
12.	SR-138 & 170th St West	Median U-turn (Free-flow)								
13.	SR-138 & 150th St West	Two-way Stop	11.8	B	0.1	A	12.4	B	0.1	A
14.	SR-138 & 140th St West	Two-way Stop	11.9	B	0.2	A	12.4	B	0.1	A
15.	SR-138 & 130th St West	Two-way Stop	11.8	B	0.1	A	12.5	B	0.1	A
16.	SR-138 & 110th St West	Two-way Stop	11.7	B	0.1	A	12.6	B	0.1	A
17.	SR-138 & Loop Rd West	Two-way Stop	10.6	B	0.1	A	10.9	B	0.1	A
18.	SR-138 & 90th St West	Median U-turn (Free-flow)								
19.	SR-138 & Loop Rd East	Two-way Stop	23.3	C	1.7	A	18.0	C	1.0	A
20.	SR-138 & 60th St West	Median U-turn (Free-flow)								
21.	SR-138 & 40th St West	Two-way Stop	10.9	B	0.1	A	11.2	B	0.1	A
22.	SR-138 & 30th St West	Two-way Stop	10.8	B	0.1	A	11.2	B	0.1	A
23.	SR-138 & Hwy 14 SB Off-Ramp	Roundabout	17.5	C	6.1	A	30.8	D	6.5	A
24.	SR-138 & Hwy 14 NB Off-Ramp	Roundabout	14.5	B	8.0	A	22.7	C	9.7	A

Source: Kimley-Horn and Associates, Inc. 2017; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
Grade Separated from SR-138.

Compared to the No Build Alternative, conditions are expected to remain the same or improve at every analyzed intersection. An Intersection Control Evaluation (ICE) Report was completed in compliance with Caltrans Policy and based on traffic and safety data at the time the improvements occur, Caltrans will determine the preferred intersection control based on the ICE Report.

Alternative 1 would result in a LOS of C or better at all intersections which is an acceptable LOS for Caltrans which strives for LOS between C and D or better. Therefore, Alternative 1 would not be expected to result in direct adverse impacts.

Alternative 2 (Expressway and Four-Lane Conventional Highway) Intersection LOS Year 2020/2025
Table 50 shows Alternative 2 (Expressway and Four Lane Conventional Highway) AM and PM peak hour delay and LOS for the study intersections under 2025 conditions.

Compared to Alternative 1 (Freeway/Expressway), some intersections are forecasted to experience slightly more delay (SR-138 & 3 Points Road, SR-138 & Private Road, SR-138 & 300th Street West), but nearly every intersection is still forecasted to operate at LOS B or better. Alternative 2 would result in a LOS of C or better at all intersections which is an acceptable LOS for Caltrans which strives for LOS between C and D. Therefore, Alternative 2 would not be expected to result in direct adverse impacts.

Table 50: Intersection LOS 2025 Alternative 2

No.	Intersection	2025 Alternative 2				
		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (in seconds)[1]	LOS	Delay (in seconds)[1]	LOS
1a.	SR-138 & Gorman Post Rd EB Ramps[2]	TWSC[3]	< 10	A	< 10	A
1b.	SR-138 & Gorman Post Rd WB Ramps[2]	TWSC[3]	9.2	A	10.6	B
2.	SR-138 & Private Rd	Signal	13.9	B	12.6	B
3.	SR-138 & 300th St West	Signal	15.4	B	18.2	B
4.	SR-138 & Margalo Dr	Signal	11.1	B	13.0	B
5.	SR-138 & 3 Points Rd	Signal	21.5	C	13.9	B
6.	SR-138 & 250th St West	Signal	13.9	B	12.4	B
7.	SR-138 & 245th St West	TWSC[3]	12.4	B	13.0	B
8.	SR-138 & 240th St West	TWSC[3]	12.4	B	13.0	B
9.	SR-138 & 230th St West	TWSC[3]	12.5	B	13.0	B
10.	SR-138 & 210th St West	Signal	6.4	A	7.0	A
11.	SR-138 & 190th St West	TWSC[3]	12.1	B	12.3	B
12.	SR-138 & 170th St West	Signal	6.5	A	7.0	A
13.	SR-138 & 150th St West	TWSC[3]	11.8	B	11.9	B
14.	SR-138 & 140th St West	TWSC[3]	11.9	B	11.9	B
15.	SR-138 & 130th St West	TWSC[3]	11.8	B	12.0	B
16.	SR-138 & 110th St West	TWSC[3]	11.7	B	12.1	B
17.	SR-138 & 90th St West	Signal	14.5	B	16.8	B
18.	SR-138 & 80th St West	TWSC[3]	11.7	B	11.9	B
19.	SR-138 & 70th St West	TWSC[3]	11.2	B	11.8	B
20.	SR-138 & 60th St West	Signal	12.0	B	14.4	B
21.	SR-138 & 40th St West	TWSC[3]	10.9	B	11.2	B
22.	SR-138 & 30th St West	TWSC[3]	10.8	B	11.2	B
23.	SR-138 & Hwy 14 SB Off-Ramp	Signal	6.1	A	6.5	A
24.	SR-138 & Hwy 14 NB Off-Ramp	Signal	8.0	A	9.7	A

Source: Kimley-Horn and Associates, Inc. 2014; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
2. Grade Separated from SR-138.
3. TWSC = Two-way stop control.

Table 51: Intersection LOS 2025 Alternative 2 (Intersection Delay)

	Intersection	Traffic Control	AM Peak Hour				PM Peak Hour			
			App. Delay (sec)	LOS	Int. Delay	LOS	App. Delay (sec)	LOS	Int. Delay	LOS
1a.	SR-138 & Gorman Post Road EB Ramps	Two-way Stop	<10	A	0.1	A	<10	A	0.1	A
1b.	SR-138 & Gorman Post Road WB Ramps	Two-way Stop	9.2	A	0.1	A	10.6	B	0.1	A
2.	SR-138 & Private Rd Road	Signalized	14.4	B	13.9	B	14.1	B	12.6	B
3.	SR-138 & 300th St West	Signalized	17.1	B	15.4	B	22.5	B	18.2	B
4.	SR-138 & Margalo Dr	Signalized	14.1	B	11.1	B	15.2	B	13.0	B
5.	SR-138 & 3 Points Rd	Signalized	25.9	C	21.5	C	27.0	C	13.9	B
6.	SR-138 & 250th St West	Signalized	14.3	B	13.9	B	15.3	B	12.4	B
7.	SR-138 & 245th St West	Two-way Stop	12.4	B	0.1	A	13.0	B	0.1	A
8.	SR-138 & 240th St West	Two-way Stop	12.4	B	0.1	A	13.0	B	0.1	A
9.	SR-138 & 230th St West	Two-way Stop	12.5	B	0.3	A	13.0	B	0.5	A
10.	SR-138 & 210th St West	Signalized	12.0	B	6.4	A	14.4	B	7.0	A
11.	SR-138 & 190th St West	Two-way Stop	12.1	B	0.2	A	12.3	B	0.1	A
12.	SR-138 & 170th St West	Signalized	11.1	B	6.5	A	12.6	B	7.0	A
13.	SR-138 & 150th St West	Two-way Stop	11.8	B	0.1	A	11.9	B	0.1	A
14.	SR-138 & 140th St West	Two-way Stop	11.9	B	0.2	A	11.9	B	0.1	A
15.	SR-138 & 130th St West	Two-way Stop	11.8	B	0.1	A	12.0	B	0.1	A
16.	SR-138 & 110th St West	Two-way Stop	11.7	B	0.1	A	12.1	B	0.2	A
17.	SR-138 & 90th St West	Signalized	15.8	B	14.5	B	19.7	B	16.8	B
18.	SR-138 & 80th St West	Two-way Stop	11.7	B	0.4	A	11.9	B	0.2	A
19.	SR-138 & 70th St West	Two-way Stop	11.2	B	0.2	A	11.8	B	0.1	A
20.	SR-138 & 60th St West	Signalized	13.6	B	12.0	B	17.5	B	14.4	B
21.	SR-138 & 40th St West	Two-way Stop	10.9	B	0.2	A	11.2	B	0.2	A
22.	SR-138 & 30th St West	Two-way Stop	10.8	B	0.2	A	11.2	B	0.2	A
23.	SR-138 & Hwy 14 SB Off-Ramp	Signal	7.0	A	6.1	A	7.6	A	6.5	A
24.	SR-138 & Hwy 14 NB Off-Ramp	Signal	10.0	A	8.0	A	11.7	B	9.7	A

Source: Kimley-Horn and Associates, Inc. 2017; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
Grade Separated from SR-138.

Highway Operations Volumes and LOS

Table 52, SR-138 Segment LOS – 2020/2025, shows the AM and PM peak hour LOS for the study freeway mainline segments on eastbound and westbound SR-138 under 2020 and 2025 conditions, respectively. For all study segment locations, SR-138 would operate at LOS D or better under the No Build Alternative. Under Alternative 1 and Alternative 2 SR-138 would operate at LOS A or B at all study segment locations due to the additional lane capacity provided under both of these alternatives in the opening year. The capacity improvements would meet the near-term increase in travel demand along the corridor and improve operations from LOS C and D in the western portion of the corridor to LOS A or B, and from LOS B to C in the central and eastern portions of the corridor to LOS A or B. Volumes for highway operations would result in a LOS of C or better at all segments analyzed which is an acceptable LOS for Caltrans which strives for LOS between C and D or better. Therefore, highway operations would not be expected to result in direct adverse impacts.

Table 52: SR-138 Segment LOS – 2020/2025

Segment	Direction	Existing		2020 No Build Alternative		2025 Alternative 1 (Freeway/ Expressway)		2025 Alternative 2 (Expressway and Four Lane Conventional Highway)	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1- I-5 Connector to Gorman Post Road	EB	A	A	A	A	A	A	A	A
	WB			A	A	A	A	B	A
2-Gorman Post Road to Old Ridge Route	EB	A	B	C	C	A	A	A	A
	WB					A	A	A	A
3-Old Ridge Route to 300th Street West	EB	A	B	C	D	A	A	A	A
	WB					A	A	B	A
4-280th Street West to 270th Street West	EB	A	B	B	C	A	A	A	A
	WB					A	B	A	A
5-Three Points Road to 245th Street West	EB	A	B	B	C	A	A	A	A
	WB					B	B	B	A
6-230th Street West to 190th Street West	EB	A	B	B	C	A	A	A	A
	WB					B	B	A	A
7-190th Street West to 130th Street West	EB	B	C	B	C	A	A	A	A
	WB					B	A	B	A
8-130th Street West to 80th Street West	EB	B	B	B	C	A	A	A	A
	WB					A	A	A	A
9-80th Street West to 30th Street West	EB	B	B	C	C	A	A	A	A
	WB					A	A	A	A
10-30th Street West to Route 14	EB	A	A	A	B	A	A	A	A
	WB					A	A	A	A

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

The interchange of SR-138 and I-5 was also analyzed under the No Build Alternative, Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway and Four Lane Conventional Highway) conditions. The analysis was completed for the merge and diverge points between I-5 and SR-138, since these locations reflect the most constrained portions of the interchange. The resulting LOS are shown in Table 53, SR-138 & I-5 Freeway Segment Analysis (Merge), and Table 54, SR-138 Segment LOS – 2020/2025 (Diverge). Along I-5, the mainline operations at SR-138 are most constrained at the merge point of SR-138 ramps onto I-5. Therefore, the LOS results reported below reflect I-5 mainline operations during the peak hours. The interchange and I-5 mainline are expected to operate at LOS C or better under 2020/2025 conditions under all Alternatives. The freeway segment analysis for SR-138 (merge and diverge) would result in a LOS of C or better at all segments analyzed which is an acceptable LOS for Caltrans which strives for an LOS between C and D. Therefore, the freeway segment analysis determined that there would be no direct adverse impacts.

Table 53: SR-138 & I-5 Freeway Segment Analysis (Merge)

Mainline & Merge Point	Period	Existing		2020 No Build Alternative		2025			
						Alternative 1		Alternative 2	
		D[1]	LOS	D[1]	LOS	D[1]	LOS	D[1]	LOS
EB SR-138 (at I-5 Merge)	AM	< 10	A	< 10	A	< 10	A	< 10	A
	PM	< 10	A	< 10	A	17	B	17	B
NB I-5 (at SR-138 Merge)	AM	26	C	19	C	22	C	22	C
	PM	26	C	20	C	23	C	23	C
SB I-5 (at SR-138 Merge)	AM	26	C	21	C	26	C	26	C
	PM	26	C	18	B	20	C	20	C
Notes1. D = Density; reported in passenger cars per mile per lane.									

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

Truck Percentages Year 2020/2025

All Alternatives, Year 2020/2025

The truck percentages for 2020/2025 were developed through linear interpolation of the 2012, 2020, 2025, and 2035 ADT with 2012 and 2035 truck ADT from the sub-area model. Truck percentages differed from the west end to the east end of the SR-138 corridor. As shown in Table 55, the 2020 No Build scenario forecasts a 13% truck percentage on SR-138 near I-5 and an 18% truck percentage on SR-138 near SR-14. With the increased capacity under Alternatives 1 and 2, single occupancy vehicles on SR-138 were forecasted to increase; despite the overall increase in vehicles, Alternatives 1 and 2 would continue to have a lower truck percentage of 8-9% along the corridor when compared to the single occupancy vehicles. For the I-5 mainline, trucks were forecasted to remain at 25% of total daily traffic volumes. Therefore, due to the proposed improvements, truck percentages would be reduced and would not be expected to result in adverse impacts.

Table 54: SR-138 Segment LOS – 2020/2025 (Diverge)

Ramp Diverge Point	Period	Existing		No Build Alternative 2020		Alternative 1 2025		Alternative 2 2025	
		D[1]	LOS	D[1]	LOS	D[1]	LOS	D[1]	LOS
SB I-5 to SR-138	AM	13	B	15	B	17	B	17	B
	PM	12	B	14	B	16	B	16	B
NB I-5 to SR-138	AM	12	B	14	B	13	B	13	B
	PM	12	B	15	B	14	B	14	B
SR-138 to I-5	AM	< 10	A	< 10	A	< 10	A	< 10	A
	PM	< 10	A	< 10	A	< 10	A	< 10	A
Notes: 1. D = Density; reported in passenger cars per mile per lane.									

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

Table 55: 2020/2025 Truck Percentages

Scenario	SR-138 West at I-5	SR-138 East at SR-14	I-5 Mainline
2020 No Build Alternative	13%	18%	25%
2025 Alternative 1	8%	9%	25%
2025 Alternative 2	8%	9%	25%
Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015			

<u>Year 2040 Conditions</u>

This section presents the analysis results of the project alternatives under design year (2040) conditions. The purpose of the design year analysis is to evaluate long-term traffic operations on SR-138 with and without the mainline improvements under the design year (2040) conditions. For each alternative, traffic operations are evaluated at the roadway segment and intersection level of detail.

Traffic forecasts were developed and traffic operations were evaluated for each of the following project alternatives under design year (2040) conditions:

- No Build Alternative
- Build Alternative 1 (Freeway/Expressway)
- Build Alternative 2 (Expressway and Four Lane Conventional Highway)

The North County Sub-Area model was used to develop travel demand forecasts under Alternative 1 and Alternative 2 based on the increase in capacity along the corridor. Both daily and peak hour traffic forecasts were obtained from the model to reflect Year 2035 traffic conditions based on planned improvements and growth in the study area. Since the sub-area model reflects Year 2035 conditions, the Design Year 2040 forecasts were developed using a calculated annual growth rate between existing volumes and the 2035 traffic forecasts, and extending the growth projections to Year 2040.

Intersection Volumes and Levels of Service Year 2040

Table 56: 2040 ADT Volumes & Forecasts

ID	Location	2012 Subarea Model	2040 Subarea No Build Alternative	2040 Subarea Alternative 1	2040 Subarea Alternative 2
1	I-5 North of SR-138	70,600	110,900	124,500	122,600
2	I-5 South of SR-138	67,900	122,300	125,800	125,800
3	I-5 NB Off-Ramp to SR-138	600	13,250	22,080	21,640
4	I-5 NB On-Ramp to SR-138	1,335	9,400	16,200	15,900
5	I-5 SB Off-ramp to SR-138	1,195	8,350	14,400	14,100
6	I-5 SB On-Ramp to SR-138	675	13,990	24,120	23,640
7	SR-138 East of I-5	4,500	40,700	73,600	71,500
8	SR-138 West of 300th Street West	4,500	30,500	68,400	66,200
9	SR-138 West of 245th Street West	4,000	23,500	54,700	52,700
10	SR-138 West of 190th Street West	3,500	17,500	48,300	46,100
11	SR-138 West of 110th Street West	3,700	18,200	45,800	43,200
12	SR-138 West of 60th Street West	3,800	17,500	42,000	38,500
13	SR-138 West of SR14	3,800	17,100	39,100	35,700
14	SR-14 North of SR138	44,300	64,200	56,700	58,300
15	SR-14 South of SR138	46,400	66,300	68,100	68,000

Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

No Build Alternative LOS Year 2040

Table 55 shows the No Build Alternative AM and PM peak hour delay and LOS for the study intersections under 2040 conditions. Table 56 and Table 57 show Alternative 1 and 2 AM and PM peak hour delay and LOS for the study intersections under 2040 conditions, respectively.

Table 57: Intersection LOS 2040 No Build Alternative

Intersection	Traffic Control	2040 No Build			
		AM Peak Hour		PM Peak Hour	
		Delay (in seconds)*	LOS	Delay (in seconds)*	LOS
1. SR-138 & Gorman Post Rd	TWSC	>300	F	>300	F
2. SR-138 & Old Ridge Route Rd	TWSC	83.9	F	>300	F
3. SR-138 & Private Rd	TWSC	224.0	F	142.7	F
4. SR-138 & 300th St West	TWSC	24.2	C	58.3	F
5. SR-138 & Margalo Dr	TWSC	14.0	B	15.8	C
6. SR-138 & 280th St West	TWSC	25.1	D	29.6	D
7. SR-138 & 3 Points Rd	TWSC	>300	F	>300	F
8. SR-138 & La Petite Ave	TWSC	>300	F	63.2	F
9. SR-138 & 230th St West	TWSC	23.6	C	22.0	C
10. SR-138 & 210th St West	TWSC	44.3	E	122.1	F
11. SR-138 & 190th St West	TWSC	39.2	E	43.6	E
12. SR-138 & 170th St West	TWSC	>300	F	103.0	F
13. SR-138 & 110th St West	TWSC	63.3	F	37.0	E
14. SR-138 & 90th St West	TWSC	223.2	F	>300	F
15. SR-138 & 85th St West	TWSC	27.7	D	36.9	E
16. SR-138 & 80th St West	TWSC	28.8	D	47.9	E
17. SR-138 & 70th St West	TWSC	27.0	D	28.5	D
18. SR-138 & 60th St West	TWSC	55.8	F	86.1	F
19. SR-138 & 30th St West	TWSC	26.4	D	30.4	D
20. SR-138 & Hwy 14 SB Off-Ramp	TWSC	12.8	B	17.5	C
21. SR-138 & Hwy 14 NB Off-Ramp	TWSC	11.4	B	21.0	C

TWSC= two-way stop controlled   Source: Fehr & Peers, Northwest 138 Corridor Traffic Analysis, August 2015

No Build Conditions

Under the No Build Alternative during the AM peak period three intersections are forecast to operate at LOS B, two at LOS C, five at LOS D, two at LOS E, and nine at LOS F. During the PM peak hour, four intersections are forecasted to operate at LOS C, three at LOS D, four at LOS E, and 10 at LOS F. Under 2040 conditions, impacts at several intersections would result in LOS of E and F which is an unacceptable

LOS. Caltrans strives for an acceptable LOS between C and D. Based on the traffic study analysis, no mitigation measures were available that would mitigate the impacts to acceptable levels. However, freeway conditions would be expected to improve with implementation of the proposed freeway improvements, which include road widening and other road improvements. Therefore, impacts under 2040 conditions for No Build Alternative would be expected to result in adverse impacts unless project improvements were implemented, which would reduce the LOS at the intersections under 2040 conditions.

Alternative 1 (Freeway/Expressway) Intersection LOS Year 2040

Table 58, Intersection LOS 2040 Alternative 1 (Freeway/Expressway), shows the AM and PM peak hour delay and LOS for the study intersections under 2040 conditions.

Table 58: Intersection LOS 2040 Alternative 1

No.	Intersection	2040 Alternative 1				
		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (in seconds)1	LOS	Delay (in seconds) 1	LOS
1a.	SR-138 & Gorman Post Rd EB Ramps2	TWSC3	18.6	C	27.8	D
1b.	SR-138 & Gorman Post Rd WB Ramps2	TWSC3	10.3	B	16.0	C
2a.	SR-138 & Private Rd EB Ramps2	Signal	6.6	A	7.5	A
2b.	SR-138 & Private Rd WB Ramps2	Signal	8.7	A	7.5	A
3a.	SR-138 & 300th St W EB Ramps2	Signal	7.5	A	10.4	B
3b.	SR-138 & 300th St W WB Ramps2	Signal	8.0	A	11.3	B
4.	SR-138 & Margalo Dr	Displaced Left (Free-flow)				
5.	SR-138 & 3 Points Rd	Median U-turn (Free-flow)				
6.	SR-138 & 250th St West	Displaced Left (Free flow)				
7.	SR-138 & 245th St West	TWSC3	21.3	C	25.3	D
8.	SR-138 & 240th St West	TWSC3	21.3	C	25.5	D
9.	SR-138 & 230th St West	TWSC3	23.3	C	26.3	D
10.	SR-138 & 210th St West	Median U-turn (Free-flow)				
11.	SR-138 & 190th St West	TWSC3	21.4	C	22.7	C
12.	SR-138 & 170th St West	Median U-turn (Free-flow)				
13.	SR-138 & 150th St West	TWSC3	18.8	C	20.7	C
14.	SR-138 & 140th St West	TWSC3	19.8	C	21.4	C
15.	SR-138 & 130th St West	TWSC3	18.8	C	20.8	C
16.	SR-138 & 110th St West	TWSC3	19.2	C	21.3	C
17.	SR-138 & Loop Rd West	TWSC3	14.0	B	14.9	B
18.	SR-138 & 90th St West	Median U-turn (Free-flow)				
19.	SR-138 & Loop Rd East	Displaced Left-Turn (Free-flow)				
20.	SR-138 & 60th St West	Median U-turn (Free-flow)				
21.	SR-138 & 40th St West	TWSC3	15.1	C	17.4	C
22.	SR-138 & 30th St West	TWSC3	15.4	C	17.9	C
23.	SR-138 & Hwy 14 SB Off-Ramp	Roundabout	15.4	C	11.3	B
24.	SR-138 & Hwy 14 NB Off-Ramp	Roundabout	16.3	C	19.8	C

Source: Kimley-Horn and Associates, Inc. 2015; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
Grade Separated from SR-138.
TWSC = Two-way stop control.

Table 59: Intersection LOS 2040 Alternative 1(Intersection Delay)

Intersection		Traffic Control	AM Peak Hour				PM Peak Hour			
			App. Delay (sec)	LOS	Int. Delay	LOS	App. Delay (sec)	LOS	Int. Delay	LOS
1a.	SR-138 & Gorman Post Road EB Ramps	Two-way Stop	18.6	C	12.9	B	27.8	D	23.5	C
1b.	SR-138 & Gorman Post Road WB Ramps	Two-way Stop	10.3	B	1.4	A	16.0	C	3.4	A
2a.	SR-138 & Private Rd Road EB Ramps	Signalized	7.0	A	6.6	A	8.9	A	7.5	A
2b.	SR-138 & Private Rd Road WB Ramps	Signalized	9.8	A	8.7	A	9.7	A	7.5	A
3a.	SR-138 & 300th St W EB Ramps	Signalized	8.9	A	7.5	A	12.6	B	10.4	B
3b.	SR-138 & 300th St W WB Ramps	Signalized	16.3	C	8.0	A	12.0	B	11.3	B
25.	SR-138 & Margalo Dr	Displaced Left (Free-flow)								
26.	SR-138 & 3 Points Rd	Median U-turn (Free-flow)								
27.	SR-138 & 250th St West	Displaced Left (Free flow)								
28.	SR-138 & 245th St West	Two-way Stop	21.3	C	0.2	A	25.3	D	0.1	A
29.	SR-138 & 240th St West	Two-way Stop	21.3	C	0.1	A	25.5	D	0.1	A
30.	SR-138 & 230th St West	Two-way Stop	23.3	C	0.6	A	26.3	D	1.1	A
31.	SR-138 & 210th St West	Median U-turn (Free-flow)								
32.	SR-138 & 190th St West	Two-way Stop	21.4	C	0.3	A	22.7	C	0.2	A
33.	SR-138 & 170th St West	Median U-turn (Free-flow)								
34.	SR-138 & 150th St West	Two-way Stop	18.8	C	0.1	A	20.7	C	0.1	A
35.	SR-138 & 140th St West	Two-way Stop	19.8	C	0.2	A	21.4	C	0.1	A
36.	SR-138 & 130th St West	Two-way Stop	18.8	C	0.1	A	20.8	C	0.1	A
37.	SR-138 & 110th St West	Two-way Stop	19.2	C	0.2	A	21.3	C	0.1	A
38.	SR-138 & Loop Rd West	Two-way Stop	14.0	B	0.0	A	14.9	B	0.0	A
39.	SR-138 & 90th St West	Median U-turn (Free-flow)								
40.	SR-138 & Loop Rd East	Displaced Left-Turn (Free-flow)								
41.	SR-138 & 60th St West	Median U-turn (Free-flow)								
42.	SR-138 & 40th St West	Two-way Stop	15.1	C	0.1	A	17.4	C	0.1	A
43.	SR-138 & 30th St West	Two-way Stop	15.4	C	0.2	A	17.9	C	0.2	A
44.	SR-138 & Hwy 14 SB Off-Ramp	Roundabout	15.4	C	127.8	F	11.3	B	229.4	F
45.	SR-138 & Hwy 14 NB Off-Ramp	Roundabout	16.3	C	98.8	F	19.8	C	236.4	F

Source: Kimley-Horn and Associates, Inc. 2017; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
Grade Separated from SR-138.

Under Alternative 1 (Freeway/Expressway), during the AM peak hour, four intersections are forecast to operate at LOS A, two intersections are forecasted to operate at LOS B, and 13 are forecasted to operate at LOS C. Eight intersections were not analyzed because they are configured to have free-flow traffic conditions. During the PM peak hour, two intersections were forecast to operate at LOS A, four at LOS B, nine at LOS C, and four intersections were forecasted to operate at LOS D. Compared to the No Build scenario, conditions are expected to remain the same or improve at every analyzed intersection, with the exception of two intersections during the AM peak hour and one intersection during the PM peak hour. During the AM peak hour, the SR-138 & SR 14 northbound and southbound off ramps are forecast to worsen from LOS B to LOS C. During the PM peak period, SR-138 & 230th Street West is forecast to worsen from LOS C to LOS D. Under 2040 conditions, Alternative 1 would result in a LOS of C or better at all segments analyzed which is an acceptable LOS for Caltrans which strives for LOS between C and D. Therefore, highway operations for Alternative 1 under 2040 conditions would not be expected to result in adverse impacts.

Alternative 2 (Expressway/Four-Lane Conventional Highway) Intersection LOS Year 2040
Table 60, Intersection LOS 2040 Alternative 2 (Expressway/Four-Lane Conventional Highway), shows AM and PM peak hour delay and LOS for the study intersections under 2040 conditions.

In compliance with Caltrans Policy, an Intersection Control Evaluation (ICE) Report was prepared and attached to the Transportation Analysis Report. The ICE Report analyzed all viable intersection control treatments for intersections within the project limits. Caltrans reserves the right to determine the preferred intersection control for each intersection based on traffic and safety data at the time the improvements occur.

Table 60: Intersection LOS 2040 Alternative 2 (Expressway/Four-Lane Conventional Highway)

No.	Intersection	2040 Alternative 2				
		Traffic Control	AM Peak Hour		PM Peak Hour	
			Delay (in seconds) [1]	LOS	Delay (in seconds) [1]	LOS
1a.	SR-138 & Gorman Post Rd EB Ramps[2]	TWSC[3]	< 10	A	< 10	A
1b.	SR-138 & Gorman Post Rd WB Ramps[2]	TWSC[3]	10.3	B	16.1	C
2.	SR-138 & Private Rd EB Ramps	Signal	21.2	C	18.3	B
3.	SR-138 & 300th St W EB Ramps	Signal	20.7	C	21.6	C
4.	SR-138 & Margalo Dr	Signal	30.8	C	47.2	D
5.	SR-138 & 3 Points Rd	Signal	34.1	C	44.0	D
6.	SR-138 & 250th St West	Signal	21.3	C	29.0	C
7.	SR-138 & 245th St West	TWSC[3]	20.5	C	23.3	C
8.	SR-138 & 240th St West	TWSC[3]	20.7	C	23.4	C
9.	SR-138 & 230th St West	TWSC[3]	22.4	C	23.9	C
10.	SR-138 & 210th St West	Signal	18.0	B	36.8	D
11.	SR-138 & 190th St West	TWSC[3]	20.7	C	20.7	C
12.	SR-138 & 170th St West	Signal	13.3	B	24.6	C
13.	SR-138 & 150th St West	TWSC[3]	18.3	C	18.8	C
14.	SR-138 & 140th St West	TWSC[3]	18.9	C	19.5	C
15.	SR-138 & 130th St West	TWSC3	18.0	C	18.9	C
16.	SR-138 & 110th St West	TWSC3	18.5	C	19.5	C
17.	SR-138 & 90th St West	Signal	21.2	C	24.2	C
18.	SR-138 & 80th St West	TWSC3	19.5	C	19.5	C
19.	SR-138 & 70th St West	TWSC3	16.1	C	18.0	C
20.	SR-138 & 60th St West	Signal	15.6	B	27.2	C
21.	SR-138 & 40th St West	TWSC3	14.8	B	16.1	C
22.	SR-138 & 30th St West	TWSC3	15.0	B	16.5	C
23.	SR-138 & Hwy 14 SB Off-Ramp	Signal	16.4	B	18.2	B
24.	SR-138 & Hwy 14 NB Off-Ramp	Signal	18.5	B	23.5	C

Source: Kimley-Horn and Associates, Inc. 2015; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
Grade Separated from SR-138.
TWSC = Two-way stop control.

Table 61: Intersection LOS 2040 Alternative 2 (Intersection Delay)

Intersection		Traffic Control	AM Peak Hour				PM Peak Hour			
			App. Delay (sec)	LOS	Int. Delay	LOS	App. Delay (sec)	LOS	Int. Delay	LOS
1a.	SR-138 & Gorman Post Road EB Ramps	Two-way Stop	18.6	C	12.9	B	27.8	D	23.5	C
1a.	SR-138 & Gorman Post Road EB Ramps	Two-way Stop	<10	A	0.1	B	<10	A	0.1	C
1b.	SR-138 & Gorman Post Road WB Ramps	Two-way Stop	10.3	B	0.1	A	16.1	C	0.1	A
2.	SR-138 & Private Rd Road	Signalized	36.4	D	21.2	B	22.6	B	18.3	B
3.	SR-138 & 300th St West	Signalized	27.7	C	20.7	B	34.2	C	21.6	B
24.	SR-138 & Margalo Dr	Signalized	41.7	D	30.8	C	127.8	F	47.2	D
25.	SR-138 & 3 Points Rd	Signalized	54.2	D	34.1	C	90.1	F	44.0	D
26.	SR-138 & 250th St West	Signalized	25.3	C	21.3	B	39.6	D	29.0	C
27.	SR-138 & 245th St West	Two-way Stop	20.5	C	0.2	A	23.3	C	0.1	A
28.	SR-138 & 240th St West	Two-way Stop	20.7	C	0.1	A	23.4	C	0.1	A
29.	SR-138 & 230th St West	Two-way Stop	22.4	C	0.5	A	24.9	C	1.1	A
30.	SR-138 & 210th St West	Signalized	32.4	C	18.0	B	95.8	F	36.8	D
31.	SR-138 & 190th St West	Two-way Stop	20.7	C	0.3	A	20.7	C	0.2	A
32.	SR-138 & 170th St West	Signalized	33.4	C	13.3	B	45.4	D	24.6	C
33.	SR-138 & 150th St West	Two-way Stop	18.3	C	0.1	A	18.8	C	0.1	A
34.	SR-138 & 140th St West	Two-way Stop	18.9	C	0.2	A	19.5	C	0.1	A
35.	SR-138 & 130th St West	Two-way Stop	18.0	C	0.1	A	18.9	C	0.1	A
36.	SR-138 & 110th St West	Two-way Stop	18.5	C	0.2	A	19.5	C	0.1	A
37.	SR-138 & 90th St West	Signalized	29.4	C	21.2	B	36.1	D	24.2	C
38.	SR-138 & 80th St West	Two-way Stop	19.5	C	0.6	A	19.5	C	0.3	A
39.	SR-138 & 70th St West	Two-way Stop	16.1	C	0.1	A	18.0	C	0.1	A
40.	SR-138 & 60th St West	Signalized	21.0	B	15.6	B	32.4	C	27.2	C
41.	SR-138 & 40th St West	Two-way Stop	14.8	B	0.1	A	16.1	C	0.1	A
42.	SR-138 & 30th St West	Two-way Stop	15.0	B	0.2	A	16.5	C	0.2	A
43.	SR-138 & Hwy 14 SB Off-Ramp	Signal	28.1	C	16.4	B	31.2	C	18.2	B
24.	SR-138 & Hwy 14 NB Off-Ramp	Signal	23.2	B	18.5	B	27.8	C	23.5	C

Source: Kimley-Horn and Associates, Inc. 2017; Analysis based upon traffic forecasts provided by Fehr & Peers.
1. Worst approach delay reported for two-way stop control locations.
Grade Separated from SR-138.

For Alternative 2 (Expressway/Four-Lane Conventional Highway) during the AM peak hour, one intersection is expected to operate at LOS A, eight intersections are expected to operate at LOS B, and 16 intersections are expected to operate at LOS C. During the PM peak hour, one intersection is expected to operate at LOS A, two intersections are expected to operate at LOS B, 19 intersections are expected to operate at LOS C, and three intersections are expected to operate at LOS D.

Compared to the No Build scenario, conditions are expected to remain the same or improve at every analyzed intersection. Compared to Alternative 1 (Freeway/Expressway), Alternative 2 (Expressway/Four-Lane Conventional Highway) is forecasted to experience more delayed conditions, overall. Under 2040 conditions, Alternative 2 would result in a LOS of D or better at all segments analyzed which is an acceptable LOS for Caltrans which strives for LOS between C and D. Therefore, highway operations for Alternative 2 under 2040 conditions would not be expected to result in direct adverse impacts.

Highway Operations Volumes and LOS
Table 62, 2040 ADT Volumes and Forecasts, displays the ADT forecasts under 2040 design year conditions for the No Build Alternative, Alternative 1 and Alternative 2. Considering traffic volumes would not be expected to significantly increase under 2040 conditions for the Alternatives 1 and 2 that would exceed road capacity, impacts related to highway operations would not be expected to be adverse.

Table 62: 2040 ADT Volumes and Forecasts

ID	Location	2012 Subarea Model	2040 Subarea No Build Alternative	2040 Subarea Alternative 1 (Freeway/Expressway)	2040 Subarea Alternative 2 (Expressway/Four-Lane Conventional Highway)
1	I-5 North of SR138	70,600	110,900	124,500	122,600
2	I-5 South of SR138	67,900	122,300	125,800	125,800
3	SR-138 East of I-5	4,500	40,700	73,600	71,500
4	SR-138 West of 300th Street West	4,500	30,500	68,400	66,200
5	SR-138 West of 245th Street West	4,000	23,500	54,700	52,700
6	SR-138 West of 190th Street West	3,500	17,500	48,300	46,100
7	SR-138 West of 110th Street West	3,700	18,200	45,800	43,200
8	SR-138 West of 60th Street West	3,800	17,500	42,000	38,500
9	SR-138 West of SR14	3,800	17,100	39,100	35,700
10	SR-14 North of SR138	44,300	64,200	56,700	58,300
11	SR-14 South of SR138	46,400	66,300	68,100	68,000
Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015					

Freeway LOS Year 2040

Under the No Build Alternative, SR-138 would operate at LOS E or worse conditions between Gorman Post Road and 300th Street West during AM and PM peak hours. For all other study segment locations, SR-138 would operate at LOS D or better under the No Build Alternative. Under Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway/Four-Lane Conventional Highway), SR-138 would operate at LOS C or better at all study segment locations because of the additional lane capacity. Alternative 2 would operate at a slightly worse LOS than Alternative 1 in the westbound direction during the AM peak hour at segment 2 and in the eastbound direction during an AM peak hour at segment 1. However, Alternative 2 operations would improve over Alternative 1 LOS at segments nine and ten under both peak hours in the east bound direction. For all other locations, the LOS would remain at LOS A, B, or C for both alternatives, showing no change in results**.**

Table 63: SR-138 Segment LOS – 2040

Segment	Direction	Existing		2040 No Build Alternative		2040 Alternative 1		2040 Alternative 2	
		AM	PM	AM	PM	AM	PM	AM	PM
1- I-5 Connector to Gorman Post Road	EB	A	A	B	B	A	B	B	C
	WB			B	A	C	B	C	B
2-Gorman Post Road to Old Ridge Route	EB	A	B	E	E	B	B	B	B
	WB					B	B	C	B
3-Old Ridge Route to 300th Street West	EB	A	B	E	E	B	B	B	C
	WB					C	B	C	B
4-280th Street West to 270th Street West	EB	A	B	D	D	B	B	B	B
	WB					C	C	C	C
5-Three Points Road to 245th Street West	EB	A	B	D	D	C	B	C	B
	WB					C	C	C	C
6-230th Street West to 190th Street West	EB	A	B	D	D	B	B	B	B
	WB					C	C	C	C
7-190th Street West to 130th Street West	EB	B	C	C	D	B	B	B	B
	WB					C	C	C	C
8-130th Street West to 80th Street West	EB	B	B	D	D	B	B	B	B
	WB					B	B	B	B
9-80th Street West to 30th Street West	EB	B	B	D	D	B	B	A	A
	WB					B	B	B	B
10-30th Street West to Route 14	EB	A	A	B	C	B	B	A	A
	WB					B	B	B	B

Truck Percentages Year 2040

The truck percentages for 2040 were based on the Year 2035 model projections for truck travel along the corridor. Truck percentages differed from the west and east end of the SR-138 corridor. As shown in Table 64, 2035 Truck Percentages – No Build Alternative/Alternative 1/Alternative 2, the 2040 No Build scenario forecast a 6% truck percentage on SR-138 near I-5 and 4% truck percentage on SR-138 near SR-14. The number of trucks using the corridor under Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway/Four-Lane Conventional Highway) would be higher than in the No Build Alternative; however, the traffic forecasts are also higher and, therefore, the overall truck percentage would be lower (approximately 5% trucks along the entire corridor). Considering truck volumes would decrease, impacts related to an increase in truck percentages would not be adverse.

Table 64: 2035 Truck Percentages– No Build/Alternative 1/Alternative 2

No Build			
Location	**2035 Truck ADT**	**2035 Model**	**2035 % Truck Growth**
SR-138 at I-5	1,970	34,000	6%
SR-138 at SR 14	560	14,600	4%
Alternative 1			
Location	**2035 Truck ADT**	**2035 Model**	**2035 % Trucks**
SR-138 at I-5	3,600	60,800	6%
SR-138 at SR 14	1,770	32,600	5%
Alternative 2			
Location	**2035 Truck ADT**	**2035 Model**	**2035 % Trucks**
SR-138 at I-5	3,470	59,300	6%
SR-138 at SR 14	1,600	29,800	5%

Source: Northwest 138 Corridor Improvement Project: Transportation Analysis Report, 2015

<u>Conclusions</u>

The analysis evaluation criteria described below were used to determine acceptable traffic operating conditions and are based on the level of service policies identified by Caltrans. A *Transportation Concept Report* (TCR, formerly the Route Concept Report) for SR-138 was prepared by Caltrans and approved in June 2014. To maintain an acceptable level of service through 2035, the TCR recommends adding two mixed-flow lanes in each direction to SR-138 between I-5 and SR-14. This is consistent with the planned improvements identified in the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016 (RTP ID: 1122004; *Northwest 138 Corridor Improvement Project – approximately 36 miles, providing an improved 4 to 6 lane facility between I-5 and SR 14*). Caltrans strives to have freeway facilities operate at a level of service between C and D. Future LOS on freeway facilities that are projected to operate at unacceptable LOS (worse than LOS D) may require mitigation.

Existing Conditions
All intersections and SR-138 mainline locations operate acceptably at LOS C or better under Existing Conditions.

No Build Alternative
Under 2020 No Build Alternative conditions, all segments of SR-138 would operate acceptably at LOS D or better during AM and PM peak hours. From Gorman Post to Road to 300th Street, SR-138 would operate unacceptably at LOS E during the AM and PM peak hours under 2040 No Build Alternative conditions. All other locations would operate acceptably at LOS D or better under 2040 No Build Alternative. However, congestion would result along the corridor at intersection locations.

Under 2020 No Build Alternative conditions, all intersection locations would operate acceptably at LOS C or better. However, the following intersections are forecast to operate unacceptably at LOS E or worse under 2040 No Build conditions during either the AM or PM peak hours, or both:

- SR-138 & Gorman Post Road
- SR-138 & Old Ridge Route Road
- SR-138 & Private Road
- SR-138 & 300th Street West
- SR-138 & 3 Points Road
- SR-138 & La Petite Avenue
- SR-138 & 210th Street West
- SR-138 & 190th Street West
- SR-138 & 170th Street West
- SR-138 & 110th Street West
- SR-138 & 90th Street West
- SR-138 & 85th Street West
- SR-138 & 80th Street West
- SR-138 & 60th Street West

Alternative 1- Freeway/Expressway
All intersections and SR-138 mainline locations operate acceptably at LOS D or better under 2025 and 2040 conditions.

Alternative 2 -Expressway/Limited Access Conventional Highway
All intersections and SR-138 mainline locations operate acceptably at LOS D or better under 2025 and 2040 conditions.

The Intersection Control Evaluation (ICE) Report in compliance with Caltrans Policy was prepared and attached in the approved NW 138 Corridor Improvement Project, Transportation Analysis Report. The ICE Report analyzed all viable intersection control alternatives at all listed intersections within the project limits. Caltrans reserves the right to determine its preferred intersection control based on traffic data and safety at the time the improvements occur.

Cumulative Impacts

Cumulative impacts identified for the segment of SR-138 are those impacts that result from past, present, and reasonably foreseeable future actions within the cities of Palmdale and Lancaster, as well as unincorporated Los Angeles County.

The North County Sub-Area model, which includes portions of Los Angeles County, the Cities of Lancaster, Palmdale and Santa Clarita was used to develop travel demand forecasts for the project under Alternative 1, and Alternative 2 along the SR-138 corridor. The sub-area model reflects the socioeconomic projections and transportation network improvements contained in the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP) and the Kern Council of Governments (COG) RTP model. The SCAG RTP model consist of three networks:

- Base Year Network
- 2035 Baseline Network – Includes all Near-Term Funded Projects
- 2035 Planning Network – Includes all Financially Constrained Projects to 2035

The following roadway improvements, are reflected in the 2035 Planning network and therefore included in this analysis:

- High Speed Rail – The 2035 Planning network reflects Phase I of the High Speed Rail project, extending from Anaheim into Kern County. In the model area, the High Speed Rail travels north-south between SR-14 and I-15. The High Speed Rail also travels south on SR-14 into Santa Clarita with a station in Palmdale.
- High Desert Corridor – New expressway route with limited access beginning at SR-14 and extending east into San Bernardino County. The High Desert Corridor would be a divided highway with three to four travel lanes in each direction.
- SR-138 between I-5 and SR-14 – Planned widening from a 2-lane full-access expressway route with at-grade crossings to a 6-lane limited-access expressway route with interchanges.
- Sierra Highway between SR-138 and Avenue E – Planned widening from a 2-lane full-access arterial to a 4-lane limited access expressway route (SR-138 extension/High Desert Corridor).
- Avenue E between Sierra Highway and 90th Street – Planned widening from a 2-lane full-access collector to a 4-lane limited access expressway route (SR-138 extension).
- 90th Street between Avenue E and Avenue L – Planned widening from a 2-lane full-access collector to a 4-lane limited access expressway route (SR-138 extension).
- I-5 between Ridge Route Road and SR-14 – Construction of an HOV lane in each direction.
- SR-14 between Avenue M and I-5 – Addition of an HOV lane in each direction.
- 30th Street between Avenue G and Avenue H – Planned widening from two to four lanes.

Both daily and peak hour traffic forecasts were obtained from the model to reflect Year 2035 traffic conditions based on planned improvements and growth in the study area. Since the sub-area model reflects Year 2035 conditions, the Design Year 2040 forecasts were developed using a calculated annual growth rate between existing volumes and the 2035 traffic forecasts, and extending the growth projections to Year 2040. Therefore, with project implementation, cumulative impacts would not be expected to result in adverse impacts.

Avoidance, Minimization, and/or Mitigation Measures
Construction of the proposed improvements would be staged to minimize impacts to traffic on SR-138.

TRAF-1 Construction of the proposed improvements would be staged to minimize impacts to traffic on SR-138, I-5 and SR-14 during construction.

On SR-138, a large portion of the proposed facility does not overlap the existing alignment which allows for the preservation and use of the existing facility during construction. Under these conditions the entire width of the proposed facility can be constructed adjacent to the existing facility without any major traffic interruptions. Sections of the proposed facility that do overlap the existing highway can be staged to allow construction of either the westbound or eastbound pavement while keeping traffic on the existing facility.

TRAF-2 A minimum of two lanes would remain open during the construction period. Temporary detours are needed at several locations along the corridor where the proposed facility intersects the existing to avoid full closure of the highway.

TRAF-3 Implement the Northwest 138 Corridor Improvement Project Revised Traffic Management Plan (TMP) to address specific short-term traffic impacts during construction of the proposed project. The TMP contains the following elements intended to reduce traveler delay and enhance traveler safety. These elements may be refined during final design for implementation during project construction.

TMP Elements
Public Information Motorist Information Strategies Incident Management Construction Zone Enhanced Enforcement Program (COZEEP) Alternative Route Strategies

TRAF-4 Coordination between Caltrans and the County of Los Angeles would be required during construction to ensure that potential impacts where the trails converge at SR-138 and Ridge Route Road are minimized by avoiding concurrent construction at this intersection.

TRAF-5 During implementation, temporary re- routing of bicycle traffic may be required during the second stage of construction. Bicycling advocacy groups could be included in planning the temporary detour, and the cycling public would be included as part of the scoping process to ensure the inclusion of bike-friendly design elements in the project.

Construction Impacts
Construction is estimated to begin April 2022 and end April 2025. Total duration is estimated at 3 years or 750 working days. Construction of the proposed improvements would be staged to minimize impacts to traffic on SR-138. Proposed improvements to SR-138 consist of widening existing shoulders to standard width.

Construction staging would require that one lane of traffic in each direction is open to the public at all times; the anticipated construction staging would allow construction of new lanes adjacent to the existing lanes (either north or south of the existing roadway), allowing traffic to continue to use the existing lanes and then allow traffic to use the new lanes during construction of the remaining lanes over the existing roadway.

Potential impacts may result during construction where the bicycle trails converge at the intersection of SR-138 and Ridge Route Road. However, impacts would depend on construction schedules for each new trail and would be expected to be minimal.

3.1.7 VISUAL/AESTHETICS

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of *aesthetic*, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

Affected Environment

This section is based on the NW SR-138 Visual Impact Assessment that was completed in September 2015 in accordance with the guidance outlined in the publication *Visual Impact Assessment for Highway Projects* published by the Federal Highway Administration (FHWA) in March 1981.

The existing visual context is characterized by miles of desert scenery with sparse, low density rural residential developments and some agriculture spread throughout the area. The landscape is characterized by desert chaparral consisting of desert scrub and Joshua trees.

The land use within the corridor is primarily rural and suburban residential, but it also includes some areas of commercial, industrial, recreational, open space, and agricultural land uses. Scenic resource areas have been identified within and adjacent to the project area. Scenic resources within the project area are views of poppy fields when in bloom, Joshua trees seen from the highway and the Kinsey mansion. Scenic resources outside the project area are the Arthur B. Ripley Desert Woodland State Park and California Poppy Reserve. No portion of this project is within an officially designated scenic highway.

Visual Assessment Units

A visual assessment unit is a portion of the regional landscape and can be thought of as an outdoor room that exhibits a distinct visual character. Units also make it easier to comprehend a large study area. The following Visual Assessment Units were defined within the study area:

- Route 5 Interchange Visual Assessment Unit

The interchange of SR-138 with I-5 on the west and the interchange with SR-14 on the east are in areas of little development. There are few landmarks other than the highway. (Key views 1 and 2)

- Sierra Pelona Foothills Visual Assessment Unit

The Sierra Pelona Mountains form the southern backdrop of SR-138 where it begins at I-5. The highway curves around hilly terrain. Gorman Post Road is the main road in this area and provides access to aqueduct service facilities. The highway and power transmission lines are the main signs of development in this area. (Key view 3)

- Open Water and Historic Resource Visual Assessment Unit

Quail Lake and portions of the California Aqueduct are visible from the road as the landscape character transitions to a flat desert topography. A historic building called the Kinsey Mansion is on the south side of the road opposite the lake. The main vegetation communities are scrub oak chaparral. (Key views 4 and 5)

- Desert Transition Visual Assessment Unit

The visual transition to desert typology is sudden when traveling eastbound. In the westbound direction there are sensory cues that one is leaving the desert including transition from flat terrain to hilly terrain, and curves in the road as the highway navigates the topography. (Key view 6)

- Desert Scrub Visual Assessment Unit

Desert Scrub Visual Assessment Unit: Flat terrain with views of the desert characterize the main portion of the corridor. Sparse desert scrub, stands of Joshua trees, some agriculture and distant views of mountains are visible from the road. The highway runs in a straight line on flat terrain from the community of Neenach to the SR-14 interchange, a distance of about 20 miles. (Key views 7-12)

- Developed Land Visual Assessment Unit

The two communities of Neenach and Antelope Acres have primarily single story residential and some commercial/retail development. This visual unit is distinguished by flat terrain, small buildings of wood frame construction, ornamental plantings, and relatively dense stands of ornamental trees. (Key views 13-14)

- State Route 14 Interchange Visual Assessment Unit

The approach to the interchange begins approximately 700 feet before the southbound on and off ramps with a slight increase in elevation that is not very noticeable in a motor vehicle. From SR-14 the overcrossing bridge is a simple minimalist structure with earthen abutments and two rectangular center columns. (Key views 13 and 14)

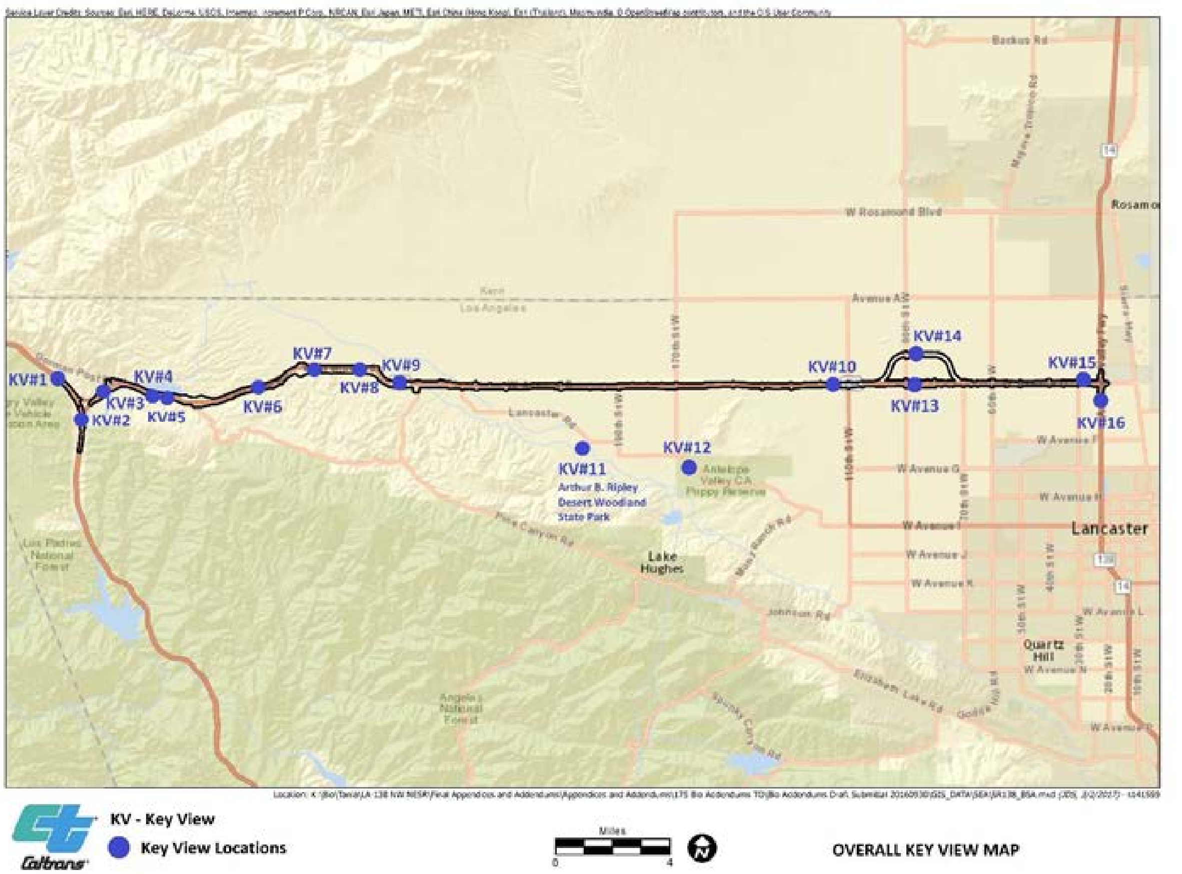
Key Views

Key views within the various visual assessment units were selected to best demonstrate the possible changes in the project's visual resources. A total of 16 key views were selected. The key view locations are listed below and are identified in Figure 28.

- Key View (KV)-1 - From I-5 looking north
- KV-2 - From I-5 looking south
- KV-3 - From SR-138 at Gorman Post Road, looking west
- KV-4 - From SR-138 looking north at Quail Lake

- KV-5 - From SR-138 looking south at Kinsey Mansion
- KV-6 - From SR-138 looking east toward 300th Street West
- KV-7 - From SR-138 looking west toward 300th Street West
- KV-8 - From SR-138 looking west toward 280th Street West
- KV-9 - Looking west at 269th toward new crossing of Pacific Crest Trail
- KV-10 - Joshua trees along the highway
- KV-11 - Looking toward SR-138 from Arthur B. Ripley Desert Woodland State Park
- KV-12 - Looking toward SR-138 from California Poppy Reserve
- KV-13 - From SR-138 looking west toward 90th Street West
- KV-14 - From Avenue C looking west
- KV-15 - From SR-138 looking east toward SR-14 Interchange
- KV-16 - From SR-14 looking north toward SR-138

Figure 28 Overall Key View Map



Visual impacts of the build alternatives were determined by assessing the characteristics and quality of the existing visual resources and how they would change from the proposed project, and ultimately predicting viewer response to that change. The degree of visual quality in a view was evaluated using the following FHWA descriptive terms:

- **Vividness** is the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements.
- **Intactness** is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.
- **Unity** is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

In the existing corridor, the view of the distant mountains adds to the visual vividness. Intactness is high due to the lack of visually intrusive, tall, vertical features in the landscape. The unity of the desert vegetation and color of the desert soil and rock is an important element of the existing visual quality.

The levels of visual impact are defined relative to the change from existing visual quality and are described as follows:

- **Low** – Minor change to the existing visual resource, with low viewer response to change in the visual environment. May or may not require mitigation.
- **Moderate** – Moderate change to the visual resource with moderate viewer response. Impact can be mitigated within 5 years using conventional practices.
- **High** – A high level of change to the resource or a high level of viewer response to visual change such that design treatments cannot mitigate the impacts. Viewer response level is high. An alternative project design may be required to avoid highly adverse impacts.

Visual Character

Visual character includes attributes such as form, line, color, texture. These attributes are neither considered positive or negative but a change in visual character can be evaluated when it is compared with the viewer response to that change. Changes in visual character and be quantified by identifying how visually compatible a proposed project would be with the existing visual condition by using visual character attributes as an indicator.

The visual character of the proposed project would be somewhat compatible with the existing visual character of the corridor in terms of form which currently exists as flat, open desert, mostly rural with minor levels of manmade intrusion. Views are far reaching due to the open and generally flat to gently rolling topography. Therefore there is a moderate to moderate-high rating in terms of form and line. There are distant views of the surrounding mountains influencing visual dominance and scale. At night the sky is usually starry, and is visible here because of the lack of city light pollution. This starry sky adds much to the visual character of color (light and dark). Diversity is low due to the likeness of color and mostly flat terrain. The existing desert provides uninterrupted flow of form, line, color, and textural pattern, which provides distinguished continuity.

Viewer Groups

The population affected by the project is composed of *viewers*. Viewers are people whose views of the landscape may be altered by the proposed project—either because the landscape itself has changed or their perception of the landscape has changed.

Viewers, or more specifically the response that viewers have to changes in their visual environment, are one of two variables that determine the extent of visual impacts that would be caused by the construction and operation of the proposed project.

1. Highway Neighbors (Views to the road)

Highway neighbors are people who have views *to* the road. They can be subdivided into different viewer groups by land use. For example, residential, commercial, industrial, recreational, and agricultural land uses may generate highway neighbors or viewer groups with distinct reasons for being in the corridor and therefore having distinct responses to changes in visual resources. For this project the following highway neighbors were considered:

- Resident Viewer Group and Pedestrian Viewer Group- The resident viewer group includes people who may have views of the project area from their homes or near their homes. Residents typically have a high concern about the visual effects of the project. The pedestrian viewer group would be people who are able to view the change while travelling on foot but do not necessarily have a constant view of the project and are slightly less concerned with the visual effects.

- Recreational Area Users Viewer Group- The recreational area user viewer group includes recreation and nature preserve users as the freeway would be adjacent to Quail Lake, the Pacific Crest Trail, the Arthur B. Ripley Desert Woodland State Park, the California Poppy Reserve, and other conservation easement lands. This group is also made up of trail users (bicyclists, hikers, off-road vehicle users, horseback riders, etc.) that use several recreational trails within the project area. Such viewers tend to experience similar, but longer duration, views of the local visual environment than motorists, and they may have high expectations for a scenic experience, particularly on streets or freeways abutting or leading to parks and open space. Those that visit an open space park near a freeway may have concerns about project appearance due to its potential to disrupt their experience of the natural environment.

- Worker Viewer Group- The worker user group includes but is not limited to workers at adjacent agricultural fields, staff of the California Poppy Reserve, the SCE Substation and Concrete/Cement Plant Employees. Employees working indoors would have low duration views of the facility. Those working outside may have a higher awareness of the project appearance.

2. Highway Users (Viewers from the road)

Highway users are people who have views *from* the road. They can be subdivided into different viewer groups in two different ways—by mode of travel or by reason for travel. For example, subdividing highway users by mode of travel may yield pedestrians, bicyclists, car drivers and passengers, and truck drivers. Dividing highway users or viewer groups by reason for travel creates categories like tourists, commuters, and truckers. It is also possible to use both mode and reason for travel simultaneously, creating a category like *bicycling tourists,* for example. For this project the following highway users were considered:

- Motorist Viewer Group- The motorist viewer group consists of commuters, local residents, commercial and industrial truck drivers, and tourist and recreational drivers. Motorist awareness of surrounding views varies based on travel speed, purpose of the drive, and visual quality of surrounding views. With frequent travel through the area, commuters are primarily focused on the commute. Commuters usually see the views as a secondary focus. Unlike local residents, commuters do not have the same sense of ownership and awareness of views because they do not reside within that environment, they only pass through it. Whereas, commuters and residents gain familiarity with surrounding views through repetitive exposure, tourists have less familiarity with existing views. Passengers are more aware of a wider range of views.

- Bicyclist Viewer Group- The bicyclist viewer group consists of bicycle commuters, resident recreational bicyclist and bicycle tourists. Bicyclist's awareness of surrounding views varies based on travel speed, purpose of the ride, and visual quality of surrounding views. Because bicyclists are generally traveling at a slower pace, they have a longer duration of views than the motorists regardless of their intent of travel.

Context Sensitive Solutions

To address local values, Caltrans uses "Context Sensitive Solutions" as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. CSS are reached through a collaborative, interdisciplinary approach involving all stakeholders.

Environmental Consequences

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental.

The visual quality of the existing corridor would be altered by the proposed project. The proposed project would have a moderate effect on the existing visual quality of the area. Structures would alter the continuity of the desert basin. The structures would become the most vivid element in some of those viewpoints. Any vertical or visually imposing elements would disrupt intactness of a viewpoint. The addition of lanes would affect the intactness of the short- range view.

Texture would be changed due to greater amounts of pavement and elimination of some existing vegetation. The proposed project would create new sources of light and glare that would adversely affect day and nighttime views in the area, therefore changing the character element of color (light and dark). The following section describes visual impacts, compares existing conditions to the proposed alternatives, and includes the predicted viewer response.

Key View (KV) #1: On I-5 looking north toward SR-138 interchange - *Existing Condition*

The existing view of the northbound I-5 to eastbound SR-138 connector in winter shows a stunning backdrop for the traveler unused to snow. This view is moderate-high in visual quality based on vividness, intactness and unity. The view during most of the year is of dry grasses and sparse chaparral scrub on the hillsides. Most of the year the vividness is low due to the lack of notable landmark features, however intactness and unity are constant through the change in the seasons.

<u>KV-1 Proposed Condition – All Build Alternatives</u>

There is no simulation provided for the proposed improvements to the interchange, primarily widening for an auxiliary lane. No notable excavation would be required and new fill slopes would be shallow. No trees or notable features would be removed for construction. No existing views would be blocked.

<u>KV-1 Resource Change</u>

The proposed I-5 and SR-138 freeway to freeway interchange improvements would not affect vividness and would have a very minor effect on visual intactness and unity of the view. This would result in an almost imperceptible change to the visual quality. Overall resource change is low.

<u>KV-1 Viewer Response</u>

I-5 is a major highway outside population centers. It is unlikely that any nearby residents consider this their local roadway. Viewers are not likely to be very sensitive to minor changes that do not impact the overall view. The anticipated viewer response is low. The combination of viewer response and resource change results in an impact rating of low.

Key View (KV) #2: From I-5 looking south toward SR-138 interchange -*Existing Condition*

The existing view of the southbound I-5 to eastbound SR-138 connector shows natural hills in the background and chaparral scrub in the foreground. This view is moderate in visual quality based on vividness, intactness and unity. While the scene is fairly intact and has much unity, it is not especially vivid due to the lack of notable landmark features.

<u>KV-2 Proposed Condition – All Build Alternatives</u>
There is no simulation provided for the proposed improvements to the interchange, which is primarily widening for an auxiliary lane. There could be some excavation of the adjacent hillside although it is likely to be minimized. Excavation at the gore (where the connector diverges from the main route) could result in steeper slopes up to 2:1 that could be difficult to revegetate. No trees or notable features would be removed for construction. No views would be blocked.

<u>KV-2 Resource Change</u>
The proposed I-5 and SR-138 freeway to freeway interchange improvements would not affect visual intactness, unity or vividness of the view. This would result in an almost imperceptible change to the visual quality. Overall resource change is low.

<u>KV-2 Viewer Response</u>
This is a major highway outside population centers. It is unlikely that any nearby residents consider this their local roadway and therefore viewer sensitivity is anticipated to be low. Viewers are not likely to be very sensitive to minor changes that do not impact the overall view. The anticipated viewer response is low. The combination of viewer response and resource change results in an impact rating of low.

Key View (KV) #3: From SR-138 looking west towards Gorman Post Road - *Existing Condition*

The existing view west of Gorman Post Road looking west has a mid-ground view of high power transmission towers and hills with mountains in the distance. It is moderate in visual quality based on vividness, intactness and unity.

KV-3 Proposed Condition – All Build Alternatives (*Proposed future condition*)

The interchange with Gorman Post Road would be moved approximately 1,000 feet west of the existing location. A side slope on the north side of the road and the median between the two directions of travel would be difficult to vegetate and might look barren for many years, affecting the natural character of the surrounding landscape. The relocated and widened interchange would be more noticeable from a distance than the current configuration. The grade separated interchange proposed in Alternative 1 would add another element of human infrastructure to the relatively pristine area.

KV-3 Resource Change

The proposed relocated interchange would slightly increase visual vividness of the view. More pavement in the form of more lanes and turn pockets or a bridge creating a grade separation would negatively affect the intactness and unity of the scene. This would result in a slight lowering of the visual quality. The greatest change to visual character is in the form of texture with the natural roughness of surfaces becoming smoothed and hardened. The visual character of the proposed view would be slightly less compatible than the existing. Overall resource change is low negative change.

KV-3 Viewer Response

There would be a small number of resident viewers affected by this visual change and a higher number of motorist viewers affected by this visual change. Viewer response is expected to be low-moderate. The combination of viewer response and resource change results in an impact rating of moderate low.

Key View (KV) #4: Looking north at Quail Lake - *Existing Condition*

The existing landform at this viewpoint is of Quail Lake with mountains in the background. On the viewer's right is the white picket fence and front yard of the Kinsey Mansion.

KV-4 Proposed Condition - All Build Alternatives

There is no simulation provided for this view. No changes would be made to the view towards Quail Lake. Road widening would be to the south (right side of this picture). The median width would be minimized to protect Quail Lake and the historic mansion to the south. A concrete barrier between the two directions of travel would have some visual impact as a new feature on this route. Effects on the views to Quail Lake would be low.

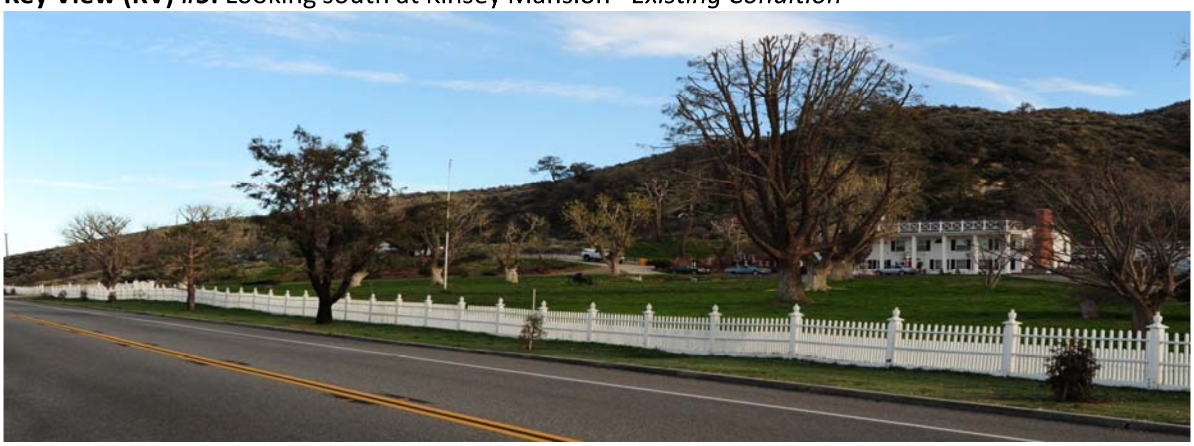
KV-4 Resource Change

The proposed widening and concrete median barrier would have a low effect on visual intactness, unity and vividness of the view. Due to the low viewing angle, the lake is not well seen from the road in a passenger car such as a sedan. However, views to open water are considered important in visual quality ratings. Therefore a conservative rating of moderate negative change to the visual quality is assigned. Overall resource change is low.

KV-4 Viewer Response

Viewer response is expected to be moderate. The combination of viewer response and resource change results in an impact rating of low.

Key View (KV) #5: Looking south at Kinsey Mansion - *Existing Condition*

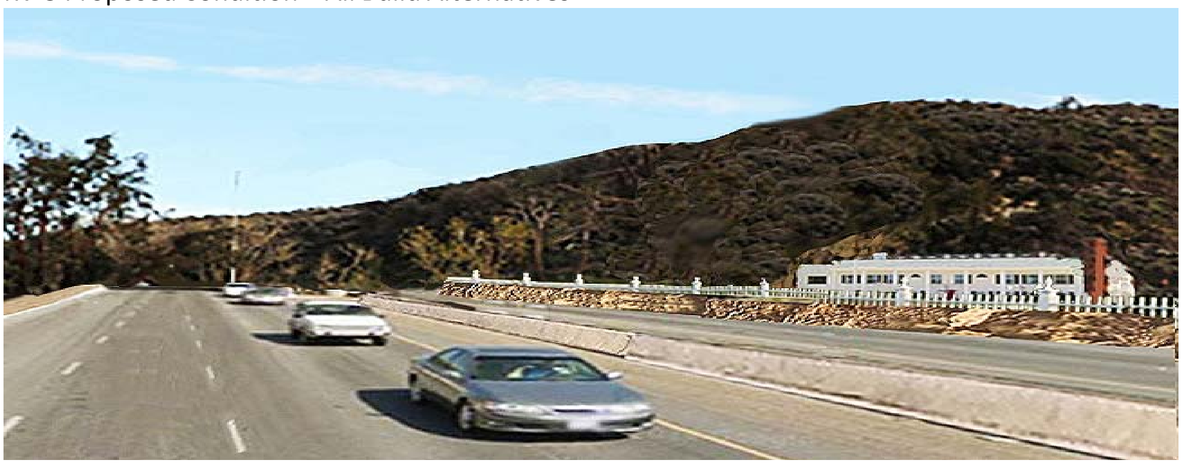


The Kinsey Mansion is located adjacent to SR-138 on Lancaster Road. The mansion was found eligible for inclusion on the National Register at the local level of significance with a period of significance equal to its construction date of 1946. While determinations of impact to historic character defining features are not a part of the Visual Impact Assessment, some consideration is given to its status as a protected feature in the landscape.

The Kinsey Mansion is considered a rare example of Neoclassical architecture in the desert area of Los Angeles County. Elements contributing to its eligibility in the National Register include its massing, Georgian-style pediment over the door, Chinese Chippendale railing on the roofline façade, side wing, full-façade porch, and classical columns along the porch façade. The front yard includes lawn ornamentation, statues, and an ornate white picket fence adjacent to SR-138. Elements that do not contribute to the mansion's historical significance include the detached garage in the rear of the property and the two smaller residential buildings east of the mansion.

The existing view from SR-138 toward the mansion is moderate in vividness. To the infrequent traveler the view to the mansion is in competition with views to Quail Lake. There is a short window to get a full view of the mansion and objects on the front lawn. A frequent traveler or a bicyclist would be able to time their viewing of the mansion to get a full view of it. The buildings surrounding the mansion itself are not related in architectural influences and do not contribute to the intactness or unity of the view. The arrangement of exotic trees in the front yard appears designed for the benefit of viewing from the mansion and does not present a cohesive pattern to the highway user viewer group. The view to the mansion is moderate in visual quality based on vividness, intactness and unity.

KV-5 Proposed Condition - All Build Alternatives



Proposed changes at this location would include widening SR-138 toward the mansion in order to preserve wetlands surrounding Quail Lake. The white picket fence would be removed and approximately half of the mansion's front yard would be taken for highway widening. A low retaining wall would be installed to hold back the slope and a frontage road created to provide access to residents of the mansion. Several mature non-native trees would be removed.

KV-5 Resource Change

The proposed widening would have the effect of bringing the historic mansion closer to the highway while removing the setting which frames it. Recommended mitigation includes treating the retaining wall with a rustic rock finish and installation of fencing visually similar to the original fencing. These mitigation measures would reduce the impact of the proposed changes and could increase the visual vividness of the resource. Overall resource change is low negative.

KV-5 Viewer Response

Resident viewers would be the residents of the mansion and are anticipated to be highly sensitive to the changes proposed. Motorist viewer response is expected to be moderate. The combination of viewer response and resource change results in an impact rating of moderate low.

Key View (KV) #6: Looking east toward 300th Street West - *Existing Condition*

The desert transitional area includes historic resources such as the Cement Plant and Bell Telegraph switching station. Rolling hillsides transition to the flat topography of the Mojave Desert as oak woodland chaparral gives way to desert scrub. There is little human development seen from the highway.

KV-6 Proposed Condition – All Build Alternatives

There is no visual simulation of how the proposed project would look for this view. The proposed realignment of the highway would require grading into some of the rolling hillsides. No trees would be removed for this work. Retaining walls would be used if necessary to protect oak trees. Recommended measures includes the use of geomorphic grading principles to provide more natural looking slopes and aesthetic treatment on retaining walls to provide a rustic look suitable to the adjacent oak woodlands.

KV-6 Resource Change

The proposed project would have a minor effect on visual vividness, intactness and unity of the view. Grading of the hillsides would result in a lowering of the visual quality. However, moving the corridor alignment to higher ground would provide a vantage point for views to the north. Visual vividness could be increased with the addition of low retaining walls, although it is unlikely they would be required. The color and texture of the landscape would be changed to include more smooth paved elements. This reduction in texture would be incompatible with the visual character of the existing view. There are no structures proposed in this location. Overall resource change is low-moderate negative change.

KV-6 Viewer Response

There are few residential viewers near this location. Overall viewer response is expected to be moderate. The combination of viewer response and resource change results in an impact rating of moderate low.

Key View (KV) #7: Looking west toward 300th Street West - *Existing Condition*

The existing view of grasslands with hills in the distance is moderate in visual quality based on vividness, intactness and unity. To the right of the photo and north of the highway are native scrub vegetation, an element of Desert Scrub Landscape Unit and a wide expansive view that is typical of the visual character of the desert landscape. The view to the south is of hills and foothills, providing visual interest. The main vegetation types through most of this area are native scrub and cheatgrass grassland, which is a non-native grass. There are also other non-native vegetation types.

KV-7 Proposed Condition – Alternative 1 (*Proposed future condition)*

The highway alignment would be shifted to the south of the existing alignment and the existing highway could be used as a frontage road. Alternative 1 proposes a grade separation with an interchange on 300th Street West; 300th Street West would cross under proposed SR-138.

KV-7 Resource Change- Alternative 1

The greatest visual impact would be for the Highway Neighbors viewer group, those with a view of the new alignment. The roadway would be raised several feet, creating a new linear ridge in contrast to the nearby rolling foothills. The undercrossing would appear as a short tunnel.
The undercrossing structure would not be seen by the majority of viewers, the Highway Users viewer group. Raising the highway elevation would change the highway user's view of the surrounding landscape, bringing them closer to the foothills on the south and giving a longer view of the desert on the north.

Alternative 1 has the potential to create a visual landmark of greater vividness than the existing view, however, the change in natural character and topography might be seen as more important by some viewers. The proposed project will affect visual vividness, intactness and unity of the view. This would result in a slight lowering of the visual quality. Overall resource change is a low-moderate negative change.

KV-7 Viewer Response – Alternative 1
There are few residential viewers near this location. Overall viewer response is expected to be moderate. For Alternative 1, the combination of viewer response and resource change results in an impact rating of moderate.

KV-7 Proposed Condition – **Alternative 2** (*Proposed future condition*)

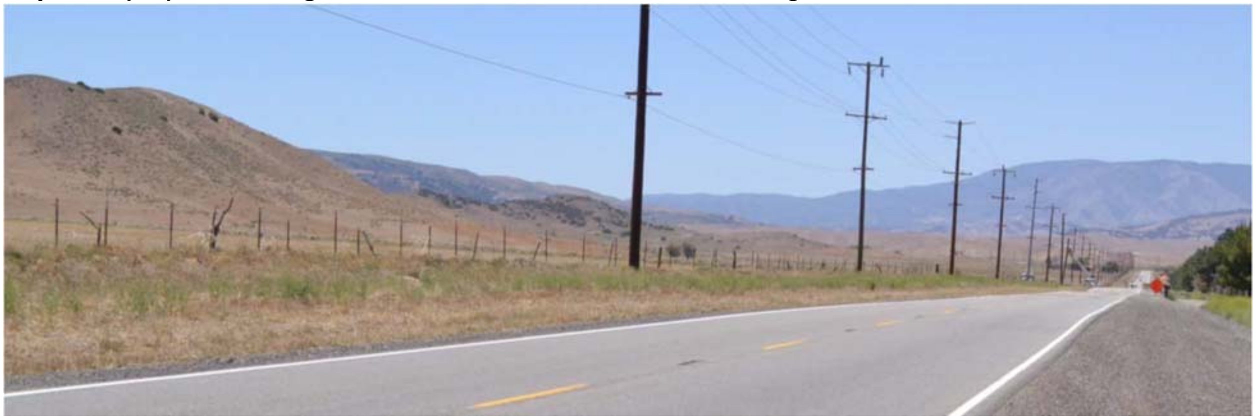
The highway alignment would be shifted to the south of the existing alignment and the existing highway could be used as a frontage road. Alternative 2 proposes an at-grade signalized intersection at 300th Street West. No trees would be removed for construction. No sensitive vegetation types would be removed.

KV-7 Resource Change- Alternative 2
Alternative 2 would shift the roadway south and add signalization at the 300th Street West intersection. The widened roadway and tall signal masts would be incongruous with the natural desert landscape, but they could be considered less objectionable than a full undercrossing structure. There would be a negative change in vividness, integrity and unity.

From the existing SR-138 alignment which would become a frontage road, or from 300th Street West, the color and texture of the desert landscape will be changed to include more smooth paved elements. This change in color and texture would be incompatible with the visual character of the view. The proposed project will affect visual vividness, intactness and unity of the view. This would result in a slight lowering of the visual quality. Overall resource change is a moderate-low negative change.

KV-7 Viewer Response- Alternative 2
There are few residential viewers near this location. Overall viewer response is expected to be moderate. For Alternative 2, the combination of viewer response and resource change results in an impact rating of moderate.

Key View (KV) #8: Looking west toward 280th Street West - *Existing Condition*



The existing view of grasslands with hills in the distance is moderate in visual quality based on vividness, intactness and unity. To the right of the photo and north of the highway are native scrub vegetation, an element of Desert Scrub Landscape Unit and also some active agricultural fields. This stretch of SR-138 has a wide expansive view typical of the visual character of the desert landscape. The view to the south is of hills and foothills, providing visual interest. The main vegetation types through most of this area are native scrub and cheatgrass grassland, which is a non-native grass. There are also other non-native vegetation types. The existing view is moderate in visual quality based on vividness, intactness and unity.

KV-8 Proposed Condition – All Build Alternatives (*Proposed future condition*)

SR-138 would shift to the south and the existing highway would become a frontage road. The realigned SR-138 would be at a slightly higher elevation and two lanes wider than the current configuration.

From the existing SR-138 alignment which would become a frontage road, the color and texture of the desert landscape would be changed to include more smooth paved elements. This change in color and texture would be incompatible with the visual character of the view. There would be a slight negative change in vividness, integrity and unity. This would result in a slight lowering of the visual quality. Overall resource change is a slight negative change.

KV-8 Resource Change

The proposed roadway alignment would not be visually intrusive. Vividness would remain the same, unity and intactness would only be slightly affected. This would result in a slight lowering of the visual quality. Overall resource change is low.

KV-8 Viewer Response

There are a small number of resident viewers affected by this visual change. Viewer response is expected to be low.

KEY VIEW (KV) #9: Looking west at 269th toward proposed crossing of Pacific Crest Trail *Existing Condition*

The existing view of desert scrub in the foreground with low hills in the mid-ground and mountains in the distance is moderate in visual quality based on vividness, intactness and unity. At this time the area is not connected to a trail system.

KV-#9 Proposed Condition – All Build Alternatives (*Proposed future condition*)

The proposed realignment of the Pacific Crest Trail would bring the crossing of SR-138 to this location where a culvert would provide safe crossing for hikers and wildlife as well. The roadway would be raised to accommodate the crossing.

KV-9 Resource Change

Raising the highway above grade would affect visual intactness, vividness and unity of the view. For trail users, visual vividness could be increased by creating a portal through which to view the other side of the trail. There are no residences in this area, so off highway viewers would most probably be trail users. While this would result in a slight drop in unity and intactness, it would provide motorists with a raised vantage point without increasing the view of human infrastructure. This would result in a slight improvement to the visual quality. Overall resource change is low negative change.

KV-9 Viewer Response
Hikers will be the main viewers affected by this visual change for long durations. Viewer response is expected to be moderate. The combination of viewer response and resource change results in an impact rating of moderate low.

KEY VIEW (KV) #10: Joshua trees along the highway - *Existing Condition*

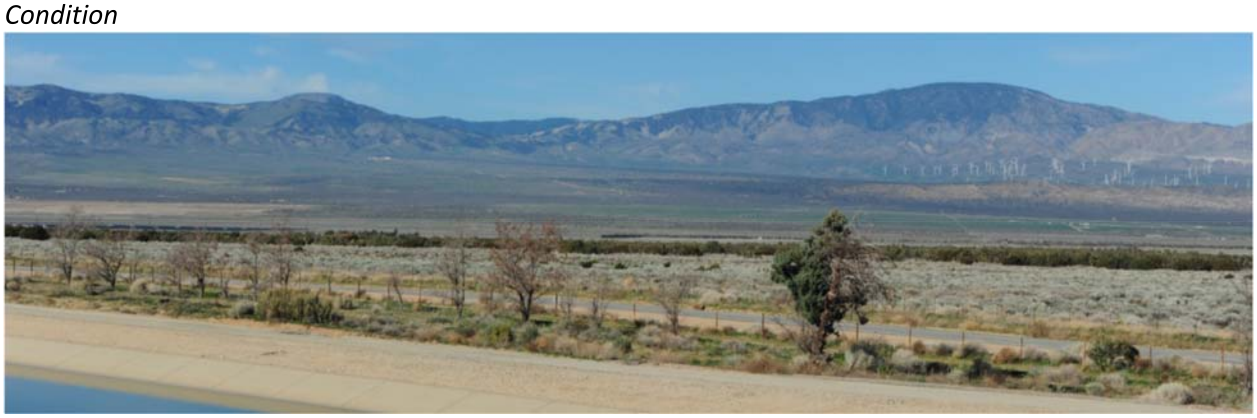
Joshua trees close to the highway alignment.

KV-10 Proposed Condition – All Build Alternatives
There is no simulation provided for this view. The proposed project would require that some Joshua trees and other native plants be relocated for construction of more highway lanes. The additional pavement would increase the amount of human intrusion, but the effect will not change the character of the setting. The change to visual intactness, vividness and unity of the view are anticipated to be low.

KV-10 Resource Change
While existing vegetation close to the highway would be removed, the viewer would be brought closer to other existing vegetation beyond. The proposed project is not anticipated to cause much if any change in the viewshed. Overall resource change is low-negative.

KV-10 Viewer Response
Viewer response is expected to be moderate- low. The combination of viewer response and resource change results in an impact rating of moderate low.

KEY VIEW (KV) #11: Looking toward SR-138 from Arthur B. Ripley Desert Woodland State Park- *Existing Condition*



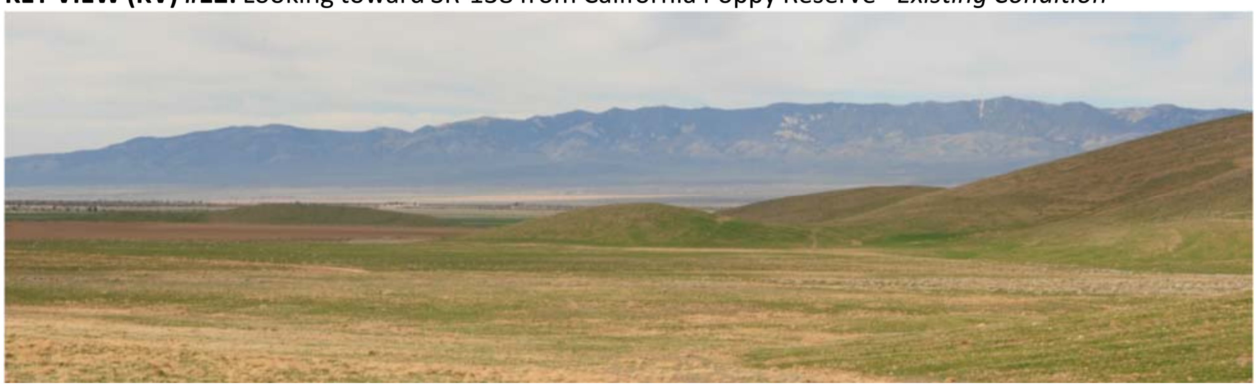
The existing landform at this viewpoint is flat with open desert landscape and human infrastructure of a canal in the foreground. In the background is SR-138 with windmills in the far background. The existing view is moderate-high in visual quality based on vividness, intactness and unity. The highway can hardly be seen from this viewpoint.

KV-11 Proposed Condition – All Build Alternatives
The proposed project would not be readily noticed from this vantage point. No changes to visual intactness, vividness or unity of the view are anticipated.

KV-11 Resource Change
The existing highway is barely perceptible from the Park. The proposed project is not anticipated to cause much if any change in the viewshed from the Park. Overall resource change is practically none.

KV-11 Viewer Response
Viewer response is expected to be low. The combination of viewer response and resource change results in an impact rating of low.

KEY VIEW (KV) #12: Looking toward SR-138 from California Poppy Reserve - *Existing Condition*



The existing view from the Poppy Reserve with SR-138 in the distance is high in visual quality based on vividness, intactness and unity. The highway can barely be seen from the Reserve.

KV-12 Proposed Condition – All Build Alternatives
The proposed project would not be readily noticed. No changes to visual intactness, vividness or unity of the view are anticipated.

KV-12 Resource Change
The existing highway is barely perceptible from the Reserve. The proposed project is not anticipated to cause much, if any, change in the viewshed from the Park. Overall resource change is none.

KV-12 Viewer Response
Viewer response is expected to be low. The combination of viewer response and resource change results in an impact rating of low.

KEY VIEW (KV) #13: Looking west toward 90th Street West - *Existing Condition*

The existing view is of non-native vegetation in a sparsely developed section of Antelope Acres. The mid-ground is dominated by human artifacts such as utility poles with distant mountains in the background. The visual quality based on vividness, intactness and unity is low-moderate.

KV-13 Proposed Condition – Alternative 1 (*Proposed future condition*)

Alternative 1 includes a divided roadway with cross traffic at grade. Medians less than 60 feet wide will most likely be treated with rock mulch for erosion control. The visual qualities of vividness, intactness and unity would be decreased slightly.

<u>KV-13 Resource Change – Alternative 1</u>

This alternative will result in much more paving. Overall resource change is low negative change.

<u>KV-13 Viewer Response – Alternative 1</u>

The primary viewers of the change at this location will be motorist, bicyclist and resident. This would be a change at the neighborhood level, changing the rural character to one of a developing town. Viewer response is expected to be moderate-high. The combination of viewer response and resource change results in an impact rating of moderate.

KV-#13 Proposed Condition – Alternative 2 (*Proposed future condition*)

Alternative 2 would include a signalized intersection and realignment of the highway, retaining the existing roadway as a local frontage road. The result would be a much larger paved area adding to light and heat reflection. The tall signal poles would be visually intrusive and imply urban development that does not otherwise exist at this location. It would be difficult to establish new plantings and cactus would probably be used to establish the first generation of live plants in the newly graded areas before local native plants could be established. The visual qualities of vividness, intactness and unity would be decreased.

<u>KV-13 Resource Change- Alternative 2</u>
The natural character would be changed to include more manmade elements. This introduction of large manmade elements would be incompatible with the visual character of the existing view. Overall resource change is moderate- low negative change.

<u>KV-13 Viewer Response- Alternative 2</u>
The primary viewers of the change at this location would be motorists, bicyclists and residents. This would be a change at the neighborhood level, changing the character of the rural settlement far from the city to one of a developing town. Viewer response is expected to be high for Alternative 2. The combination of viewer response and resource change results in an impact rating of moderate high.

KEY VIEW (KV) #14: Antelope Acres Bypass**-** Avenue C looking west - *Existing Condition*

The existing view of open land with mountains in the background is a neighborhood view in Antelope Acres. This new alignment is proposed to go around several houses that would be removed for widening along the existing highway alignment and develop the highway along a residential street where only one house would be impacted. The existing view based on vividness, intactness and unity are low-moderate. The mountains are distant elements in this view. The open area is primarily non-native vegetation which is not intact desert, however, the limited amount of human infrastructure allows for the view to retain unity. The overall visual quality is moderate.

KV-14 Proposed Condition – Alternative 1 (*Proposed future condition*)

Construction of a four- lane expressway at Avenue C and grade separation at 90th Street West.

<u>KV-14 Resource Change</u>

The proposed overcrossing structure would increase visual vividness while decreasing intactness and unity of the view. The addition of a multi-lane roadway would adversely affect day and nighttime views in the area. This would result in a lowering of the visual quality. The natural character would be changed to include more manmade elements. This introduction of large manmade elements would be incompatible with the visual character of the existing view. Overall resource change would be a moderate negative change.

KV-#14 Viewer Response

The primary viewers of the change at this location will be motorist, bicyclist and resident viewers. Human infrastructure will become much stronger visual elements. Views of existing natural features will be slightly obstructed by the bridge over the existing local roadway. A bridge structure will be a completely new type of visual element in this rural area. This road is currently used by very few people, mainly residents of this street and the two streets that connect to it. Construction of this bypass road will bring thousands of motorists per year past the houses on Avenue C. Viewer response is expected to be moderate-high. The combination of viewer response and resource change results in an impact rating of moderate-high.

KEY VIEW (KV) #15: SR- 14 IC from SR-138 looking east - *Existing Condition*

The existing view of the approach to SR-14 is not remarkable, with low vividness. Desert scrub is visible in the foreground providing a measure of unity and intactness. The visual quality rating is moderate. The SR-14 undercrossing is not readily seen from this vantage point.

KV-15 Proposed Condition – All Alternatives

There is no simulation provided for this view. The new structure would be raised the minimum needed for standard clearance over SR-14. The main change visible from SR-138 would be higher side slopes and the approach would begin further back. Viewer response is expected to be low.

KV-15 Resource Change

Overall resource change is moderate- low negative change.

KV-15 Viewer Response

The primary viewers of the change at this location would be motorists, rail passengers, bicyclists and a few residents. Viewer response is expected to be moderate. The combination of viewer response and resource change results in an impact rating of moderate.

KEY VIEW (KV) #16: From SR-14 looking north toward SR-138 - *Existing Condition*

The existing view of the existing SR-138 overcrossing based on vividness, intactness and unity the visual quality rating is low to moderate.

KV-16 Proposed Condition – All Alternatives

There is no simulation provided for this view. The proposed new structure would provide more vertical clearance. No elements in the view would be blocked. The new structure can be expected to include more aesthetic treatment that could provide greater visual interest for motorists.

KV-16 Resource Change

Overall resource change is low.

KV-16 Viewer Response

The primary viewers of the change at this location would be motorists. The bridge would become more dominant in the view, however it would not block views of other elements. Viewer response is expected to be moderate- low. The combination of viewer response and resource change results in an impact rating of moderate-low.

Summary of Visual Impacts

The introduction of more manmade elements would alter the existing natural visual character of the project area. The increased roadway width and grade separated interchanges would negatively affect visual vividness, intactness and unity. The color and texture of the desert landscape would be changed to include more smooth paved manmade elements. In a few areas such as at the new Pacific Coast Trail crossing, proposed construction would increase vividness while having a minimal effect on unity and intactness. In the desert transition areas where realigning the highway would cause cuts into hillsides, the character of the landscape would be changed. Signalized intersections may cause greater visual impact than grade separation structures if the structures are well designed and given appropriate aesthetic treatment to make them visually appealing and consistent with the local landscape typology.

The largely expansive horizontal character of the desert would be moderately affected by wider paved segments and realigned segments of highway. The horizontal character of the existing views would be changed at bridges for grade separations and moderately where the profile is raised an average of five feet for culverts to cross under the highway. The primary viewers of the change would be motorists, bikers and residents. The most sensitive viewer to the change would be residential users and the overall viewer response rating is moderate. The overall visual impact is characterized as moderate. Temporary impacts would not be great due to the relatively low amount of cut and fill operations.

Cumulative Impacts

The project study area is used as the RSA for the purpose of the visual cumulative impacts analysis. The project corridor is situated on the north side of the San Gabriel Mountains, largely within the Antelope Valley that comprises the western Mojave Desert, and south of the Tehachapi Mountains. The project corridor is largely situated in undeveloped areas within the Antelope Valley. The RSA is dominated by desert vegetation communities and agricultural fields. A number of solar farms have recently been developed along the project corridor in the central portion of the study area. The project corridor also passes through several small residential communities and bisects the California aqueduct. The majority of the eastern portion of the corridor largely comprises vegetation communities characteristic of the Mojave Desert, whereas the western one-third of the project corridor represents a transition zone between desert, foothill and montane environments. Vegetation is more diverse and a larger number of vegetation communities are present in the western portion of the RSA where the corridor reaches the foothills of the Tehachapi Mountains. The overall viewer response rating and visual impact is characterized as moderate. With implementation of the avoidance, minimization, and/or mitigation measures, the proposed project would not contribute to cumulatively considerable impacts to visual resources.

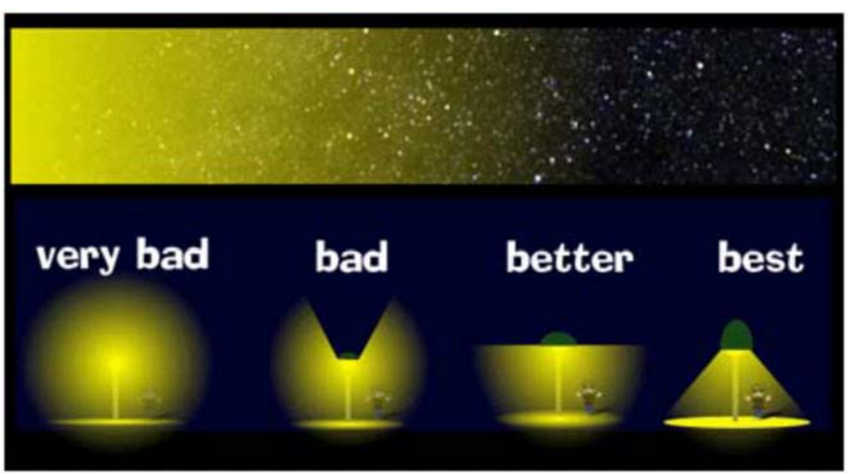
Avoidance, Minimization, and/or Mitigation Measures

Caltrans and the FHWA mandate that a qualitative aesthetic approach should be taken to address visual quality loss in the project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses the actual cumulative loss of visual quality due to a project. This approach also results in avoidance, minimization, and/or mitigation measures that can lessen or compensate for a loss in visual quality. These would be designed and implemented with concurrence of the District Landscape Architects. The following measures to avoid or minimize visual impacts shall be incorporated into the project:

VIS-1 To the extent practicable, preserve existing vegetation through thoughtful alignment of the route so that large areas of vegetation are not in the alignment's path. During construction, take good care to minimize disturbance of and protect in place the existing native vegetation, such as native riparian vegetation, California juniper, and Joshua trees as much as possible.

VIS-2 Use context sensitive street lighting designs. The project's lighting design shall be consistent with Caltrans and County lighting guidelines and standards and would be developed in coordination with Caltrans Landscape Architecture staff for areas within state right-of-way as well as with County staff.

To preserve the dark night sky as a natural resource in the desert region communities, dark-sky compliant lighting should be selected to minimize light pollution cast into the sky while maximizing light cast onto the ground, as appropriate. A lighting plan shall be developed that requires project lighting to be appropriately shielded. It is a goal of the Los Angeles County Specific Plan to preserve the dark night sky as a natural resource in the Desert Region communities. In accordance with the Antelope Valley Area Plan, Dark Sky Policies have been developed so that humans and wildlife may enjoy beautiful dark Antelope Valley skies unimpeded by light pollution. The lighting plan and context sensitive designs would help accomplish that goal.



Source: International Dark Sky Association, darksky.org

VIS-3 The project should consolidate signs to minimize visual clutter. Lack of visual obstructions, such as cables and billboards is desirable. To the extent practicable, place traffic control cabinets, irrigation controller cabinets, electrical systems cabinets, etc. so that they are not in direct view of the public.

VIS-4 Grading shall appear natural through slope rounding that facilitates a smooth and seamless transition from existing to new slopes. Recommended measures include the use of geomorphic grading principles to provide more natural looking slopes and aesthetic treatment on retaining walls to provide a rustic look suitable to the adjacent landscape.

VIS-5 To the extent practicable, keep elevated structures as low as possible or design to integrate them within the surrounding environment.

VIS-6 Plant native vegetation to replace the vegetation that would be removed or affected by construction activity. Plant vegetation that is consistent with the character of the adjacent community landscape in the Developed Land Visual Assessment Unit.

Where feasible, vegetation would be planted between roadway and communities to provide a more natural visual buffer. Use context-sensitive aesthetic treatments on structures and architecture and provide context sensitive design through color incorporated into the project elements. The aesthetic features shall be developed in coordination with Caltrans Landscape Architecture.

The recommended measures would reduce the project's visual impact. However, the inherent visual change associated with an increase in visual scale and additional hardscape would be unavoidable and noticeable even with implementation of the measures listed above. The primary overall visual effect of the project would be the increased urban character caused by the additional highway lanes, reduction of desert landscape, and at some locations, the construction of structures that would block views. The intent of the measures above would be to reduce the urbanizing effect of the project and lessen the negative visual change to the corridor. Overall however, viewer sensitivity and response to change is expected to be moderate but overall visual impacts would be less than significant with the avoidance and minimization measures included.

3.1.8 CULTURAL RESOURCES

Regulatory Setting

The term "cultural resources" as used in this document refers to all "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966 (NHPA), as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800). On January 1, 2004, a Section 106 Programmatic Agreement (Section 106 PA) between the Advisory Council, Federal Highway Administration (FHWA), State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

On January 1, 2014, the First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California (2014 PA) became effective and replaced the 2004 PA.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties. See Appendix B for specific information about Section 4(f).

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as CA Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the National Register of Historic Places listing criteria. It further specifically requires the Department to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

Affected Environment

The project area is within the region occupied by the Vanyume Serrano and Tataviam Native American groups at the time of Euro-American contact in the nineteenth century (Earle 2004; Johnson and Earle 1990). The Vanyume Serrano also had villages at the mouths of canyons along the north slope of the San Gabriel Mountains and in the rift zone that runs along the south side of the Antelope Valley (Earle 2004). Settlement locations were determined by water availability, and most Serranos lived in villages near water sources. The Tatavium had villages in the rift zone south of the western end of the Antelope Valley. The Tataviam settlement system consisted of villages located near permanent water sources at lower elevations, with resource-gathering camps in the higher elevations.

Late Prehistoric (A.D. 1200 to Contact (ca. 1800)) sites are abundant in the Mojave Desert, and include lithic scatters, temporary campsites, and large villages with middens and cemeteries. The villages were located near permanent water sources (along the Mojave River and near springs. During the Late Prehistoric Period people who lived in villages in the surrounding mountains and foothills probably went into the Antelope Valley to collect resources including rhyolite lithic material and plant foods from the juniper and Joshua tree woodlands. Rhyolite was obtained from sources at Fairmont Butte and Rosamond Hills (Scharlotta 2014). While collecting resources in the Antelope Valley people stayed overnight in temporary camps indicated by the presence of fire-affected rock (from hearths) and flaked and ground stone. There were no villages in the portion of the Antelope Valley traversed by the SR-138 study area because of a lack of permanent water sources. There are residential sites with midden at the

Fairmont Butte rhyolite source, but these may be a result of short term stays at the source repeated over thousands of years.

The first major European settlement of California began during the Spanish Period (1769 to 1821) when 21 missions and four presidios (military posts) were established between San Diego and Sonoma. Although located primarily along the coast, the missions dominated economic and political life over the majority of the California region. The Mexican government closed the missions in the 1830s and former mission lands were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or “ranchos” (Robinson 1948). However, other than the La Liebre land grant in the westernmost part of the Antelope Valley, there were no Mexican land grants in the Mojave Desert. In 1854 the establishment of Fort Tejon military post in Castac Valley and Grapevine Canyon created a gateway for travelers from the San Joaquin Valley to the Antelope Valley (COLAPL 2014). Beale established an Indian reservation at Fort Tejon and later purchased Mexican land grants in and around the Tehachapi Mountains, including Rancho La Liebre, which includes a portion of the SR-138 study area. Beale joined all of the ranchos and some former railroad grant land to create the Tejon Ranch which consisted of over 276,000 acres of land. The Tejon Ranch still exists today and has plans to develop land it owns in the western Antelope Valley.

Several developments contributed to Antelope Valley's growth starting in the mid-1800s, including gold mining along the Kern River and Owens River; cattle ranching; the start of a Butterfield stagecoach route in 1858; construction of the Los Angeles-to-San Francisco telegraph line in 1860; completion of the Southern Pacific Railroad line from San Francisco to Los Angeles in 1876; and plentiful rainfall during the 1880s and early 1890s, which attracted many farmers (Settle 1967a). The rural areas outside Lancaster, including the SR-138 study area, were settled by individual families who purchased land from the federal government or the railroad, or obtained land through the Homestead Act or the Desert Land Act. The decade-long drought that began in 1894 forced many settlers to abandon their homesteads, but after the turn of the twentieth century irrigation methods and electricity brought back local farming. The construction of the Los Angeles aqueduct (completed in 1913), spanning 233 miles between the Owens Valley and Los Angeles, also revived the valley's economy.

In the late 1960s, the California Aqueduct, part of the State Water Project (SWP), was built through the area, which expanded Crane Lake into the present Quail Lake. The road in front of the Kinsey Mansion (now Lancaster Road and SR-138) was rerouted to accommodate the expansion of Quail Lake. The new roadbed of SR-138 was aligned farther to the south, and up the slope, from the original path of the Ridge Route roadbed. The new path of SR-138 cut into the large front yard of Kinsey Mansion and brought the highway closer to the front of the property (Daly 2009). At that time, the road bed was also raised approximately 50 feet higher than the original road (Kane 2008).

The Kinsey Mansion is eligible for inclusion on the National Register at the local level of significance under Criterion C as an excellent high-style example of Neoclassical architecture in Los Angeles County. Its period of significance is its original construction date of 1946. Contributing elements include its massing, Georgian-style pediment over the door, Chinese Chippendale railing on the roofline façade, side wing, full-façade porch, and classical columns along the porch façade. Non-contributing elements include the detached garage in the rear of the property and the two smaller residential buildings east of the mansion, but within the same parcel and property. These buildings are not related in construction dates or architectural influences

With regards to integrity, close inspection of the Kinsey Mansion shows that the windows were updated at some point in history from single-pane to dual-pane. The artistic and architectural value of the mansion, however, was clearly considered when updating the windows as the wood frames still appear intact. Upgrading the windows did not significantly change the appearance or architectural merit of the mansion. The mansion was not moved from its original location and the setting remains relatively unchanged with the exception of Quail Lake across the highway changing from a natural body of water to a man-made reservoir. The feeling of early Eclectic architecture is still obvious upon looking at the mansion and it is clear that the purpose of the mansion, to be trendy and cater to popular entertainment and guests of the Kinsey's, is still present upon looking at the mansion and property. The materials, including the composite shingle roof and windows, were updated at some point to match the previously existing design theme and have not detracted from the architecture of the mansion. The remaining materials appear original and have not been altered. Overall, the property remains in very good condition, is representative of the Neoclassical style of architecture and retains good integrity of location, design, setting, feeling, materials, workmanship, and association.

The following documents provide information on historic properties within the Area of Potential Effect (APE) and serve as the basis for the analysis in this section:

Historic Property Survey Report (HPSR)	November, 2015
Historical Resources Evaluation Report (HRER)	August, 2015
Archaeological Survey Report (ASR)	August, 2015
Supplemental Archaeological Survey Report	August, 2015
2nd Supplemental Archaeological Survey Report	October, 2016
Extended Phase I Geoarchaeological Report	February, 2015
Ethnohistory Report	May, 2015
Archaeological Evaluation Report (AER)	August, 2015/ Revised May 2016
Finding of Adverse Effect (FAE)	April 11, 2017
Programmatic Agreement (PA)	June 23, 2017

The APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if present. The APE was established in consultation with Caltrans District 7 Cultural Studies staff and the Caltrans Project Manager. For the proposed project, the indirect (architectural) APE is the same as the direct (archaeological) APE and therefore there is a single APE boundary. Since the project is located along a pre-existing highway in a desert landscape that consists primarily of modern construction or vacant parcels where there is little potential for direct or indirect (visual or audible) effects, the APE is generally within a corridor that includes the Caltrans right of way. The APE includes most parcels that are adjacent to the existing Caltrans right of way. However, where parcels extend a great distance away from the highway, only the portion of the parcel directly adjacent to the highway was included. The entire APE was surveyed for archaeological resources (see APE Map in Attachment A to the HPSR).

The APE is 36.8 miles long and extends from I-5 on the west to SR-14 on the east. The APE includes the SR-138/I-5 interchange and the SR-138/SR-14 interchange plus short segments of I-5 and SR-14. An alternative route, consisting of a loop to the north around a portion of the community of Antelope Acres, is also included in the APE. The APE varies in width from 600 feet to 1,700 feet. The maximum width of the APE occurs west of 270th Street West in the community of Neenach. The vertical APE includes the depth of grading and excavation needed to construct the new roadway and the two bridge structures (crossing the California Aqueduct and at one of the overcrossing connectors to I-5 near Gorman Post Road). Grading for the roadway would be shallow, but the maximum depth of excavation for the structures is 58 feet.

Record Searches and Findings
A record search was performed May 21 to 23, 2014 at the South Central Coastal Information Center (SCCIC) of the California Historic Resources Information System at California State University, Fullerton for previously recorded cultural resources within the APE and within a 1-mile radius of the APE.

In addition to site records and reports on file at the SCCIC, the California Historic Property Data File (HPDF) for Los Angeles County (also on file at the SCCIC) was consulted for the project area. The HPDF provides information about resources determined eligible for, or listed on, the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR). It also provides information on resources that are California Historical Landmarks and California Points of Historical Interest. Historical maps were also consulted.

Property-specific historical research was conducted using the Los Angeles County Assessor's records and other public records. Ethnohistoric research was conducted using mission records, Spanish explorer's accounts, and the notes of John C. Harrington, an early ethnographer. The Caltrans on-line Inventory of State Agency Bridges – Historical Significance was consulted.

Native American consultation commenced in April 2014 in a letter requesting the Native American Heritage Commission (NAHC) perform a search of the Sacred Lands File. This request was followed with letters, telephone calls, and an in-person meeting in January 2015 with the Native American contacts listed for the project area. This consultation is on-going. Three historical societies with an interest in the project area were also contacted during the survey and property identification phase of the cultural resources studies.

<u>Properties Identified</u>
The APE was surveyed for both built environment resources and archaeological resources. Because the APE includes parcels that are private property, permission to access was requested from each property owner. All areas of the APE where right of entry was obtained were surveyed for archaeological resources, however, 24 percent of the APE could not be surveyed because right of entry was not granted. In accordance with Stipulation XII.B of the Section 106 PA, Caltrans district has sought and gained approval from the Division of Environmental Analysis/ Cultural Studies Office to phase the continued identification and evaluation for the remaining un-surveyed areas within the APE until after project approval but prior to any construction activities. A project-specific Programmatic Agreement (project-specific PA) has been developed to guide this phased identification and evaluation of any newly identified resources, as well as to resolve any adverse effects if necessary. The project-specific PA was executed on June 23, 2017.

All of the APE was surveyed for built environment resources from the public right of way. As a result of the built environment survey, 20 historic-age buildings or groups of buildings and structures that required evaluation were inventoried. Five of these were either previously determined eligible for the NRHP or were evaluated as eligible for the NRHP as a result of the current study. The historic properties include a large residence, a Bell Telephone switching station, the Los Angeles Aqueduct, and various transmission lines. One resource, a LADWP Transmission Line, could not be evaluated because LADWP could not provide information about age or function.

As a result of the archaeological survey, ten prehistoric archaeological sites and six archaeological resources from the historic period that required evaluation were identified. Seven of the prehistoric sites are lithic reduction sites. The other three prehistoric sites are located in or near the western end of the Antelope Valley. Two are lithic scatters and one is a temporary camp. The temporary campsite is evaluated as a historic property eligible for the NRHP and is also considered a historical resource for the purposes of CEQA. One of the lithic reduction sites and a portion of a second are to be treated as NRHP-eligible (and CRHR-eligible) for the purposes of the undertaking only. The archaeological sites from the historic period include three farming sites with irrigation features, structure foundations, building material, and domestic refuse; two roads; and a World War II landing field used for training. None of the archaeological resources from the historic period are evaluated as eligible for the NRHP and they are not historical resources for the purposes of CEQA.

Three prehistoric archaeological sites within the APE are determined or assumed eligible for listing on the NRHP. Six built environment cultural resources within the APE were either previously determined eligible, determined eligible as part of this undertaking or assumed eligible for listing on the NRHP. The following is a summary of eligible resources according to the National Register of Historic Places.

Archaeological Site SR-049

SR-049 is a lithic reduction site for rhyolite obtained from nearby Fairmont Butte. In total, 262 artifacts, primarily rhyolite flakes, were collected from the surface of this site. Only two of the artifacts found at the site were made out of a material other than rhyolite. Almost all of the artifacts were debitage resulting from bipolar core reduction and biface production techniques. In addition, some cores and tools were collected, including 6 cores, 1 edge-modified flake, 6 biface fragments, and 1 blade with use-wear on two edges. A total of 35 flakes and 7 shatter came from 12 STPs (only 3.5 artifacts per STP). The surface and subsurface material was evaluated as eligible for the NRHP under Criterion D because it has potential to address the research themes of settlement patterns, subsistence, lithic reduction, and chronology. The SHPO did not concur with the evaluation and determined that since archaeological site SR-049 lies outside of the area of direct impact (ADI) it will not be adversely affected by the undertaking. For the purposes of this undertaking only, this resource will be treated as eligible for listing on the NRHP under Criterion D.

Archaeological Site P19-003723

Archaeological site P19-003723 is a lithic reduction site. Most of the artifacts collected from the surface was waste material produced during the manufacture of stone tools, known as debitage. In addition, some cores and tools were collected, one of which may have been used as a large chopping tool or hammerstone. Other tools included one edge-modified secondary flake and one edge-modified rhyolite chopping or scraping tool. Five pieces of fire-affected rock (FAR) were also found on the surface. The surface cultural material was collected, but the subsurface material was evaluated as eligible for the NRHP under Criterion D because it has the potential to address the research themes of settlement patterns, subsistence, lithic reduction, ethnicity, and chronology. Caltrans evaluated this site as eligible for listing on the NRHP under Criteria D. The SHPO did not concur with the evaluation and has determined that the portion of this site that lies within and south of the ADI lacks data that contributes to the site's overall significance. Therefore for the purposes of this undertaking only the remainder northernmost portion of the site will be treated as eligible for listing on the NRHP under Criterion D.

Archaeological Site SRAS-003

Archaeological site SRAS-003 is a prehistoric temporary campsite in the western part of the APE on a ridge overlooking Quail Lake. Most of the artifacts collected from the surface were debitage which refers to all the material produced during the process of lithic reduction and the production of chipped stone tools. The surface cultural material was collected, but the subsurface material was evaluated as eligible for the NRHP under Criterion D because it has the potential to address the research themes of settlement patterns, subsistence, lithic reduction, ethnicity, and chronology. SRAS-003 is also a historical resource for the purposes of CEQA. The SHPO has concurred with Caltrans' determination of eligibility.

Kinsey Mansion

The Kinsey Mansion is located within the APE at 34860 Lancaster Road. The Kinsey Mansion was found eligible for inclusion on the National Register at the local level of significance under Criterion C with a period of significance equal to its construction date of 1946. The Kinsey Mansion is eligible under Criterion C because it is as an excellent high-style example of Neoclassical architecture in Los Angeles County. In addition, the Kinsey Mansion retains sufficient integrity to convey that significance. Contributing elements to the Kinsey Mansion include its massing, Georgian-style pediment over the door, Chinese Chippendale railing on the roofline façade, side wing, full-façade porch, and classical columns along the porch façade. In addition, the mansion is a rare example of Neoclassical architecture in the desert area of Los Angeles County.

The large front yard that includes decorations, lawn ornamentation, statues, and other iconic features contributes to the feeling and setting of the mansion. Contributing elements to the significance of the Kinsey Mansion property include the mansion building at the southern end of the property and the front lawn bounded by a driveway on both the eastern and western ends of the lawn and a white picket fence on the northern end, adjacent to SR-138. Non-contributing elements include the detached garage in the rear of the property and the two smaller residential buildings east of the mansion, but within the same parcel and property. These buildings are not related in construction dates or architectural influences. The Kinsey Mansion is also a historical resource for the purposes of CEQA. The SHPO has concurred with Caltrans' determination of eligibility.

Kinsey Mansion façade and lawn, view from SR-138 towards the south

Bell Telephone and Telegraph Switching Station

The Bell Telephone and Telegraph Switching Station (Bell Station) is located within the APE at 33700 West Lancaster Boulevard. The Bell Station was found eligible for inclusion on the National Register at the local level of significance under Criteria A and C with a period of significance from 1927 to 1934 which includes its construction and early years of use when it served as a communications switching station. The Bell Station is eligible under Criterion A because it served a valuable purpose of extending the network range of the communication industry in Los Angeles County into the developing rural regions of Southern California and was an important element of the expansion of the entire Los Angeles communication industry at the local level. The Bell Station is eligible under Criterion C because several of the buildings on the property are excellent examples of the Spanish Revival style of architecture, particularly for rural Los Angeles County. In addition, the Bell Station retains sufficient integrity to convey that significance.

Contributing elements to the Bell Station include all of the original buildings constructed on the property that were designed in the Spanish Revival style of architecture and their features such as the tile roof, stucco siding, elaborate chimneys, large focal windows, covered porches, and decorative vents. The contributing buildings include the primary switching station building, three small inter-connected buildings which were used as residences for married couples during the use of the station for that purpose, the large residential building which was used as residential quarters for up to two single men per room, and the covered water tower. The boundary of the property and its contributing elements includes the fenced-in parcel which includes all contributing buildings to the property, adjacent to the south of SR-138. Non-contributing elements include the modern corrugated metal shed and barn and animal shelter, which were constructed after the period of significance and do not match in architectural style or design. The Bell Telephone and Telegraph Switching Station is also a historical resource for the purposes of CEQA. The SHPO has concurred with Caltrans' determination of eligibility.

East elevation main Bell Switching Station building, view from SR-138 towards the southwest

Typical Spanish-Revival building within the Bell Station boundary, view from SR-138 towards the south

Spanish-Revival buildings on the western end of the Bell Station boundary, view from SR-138 south

Los Angeles Aqueduct

The Los Angeles Aqueduct intersects the APE approximately 300 meters east of Three Points Road at SR-138, and was previously determined eligible for the National Register at the State level of significance. The previous evaluations indicate that the Los Angeles Aqueduct is eligible under Criteria A , B, and C with a period of significance from 1913-1940. The Los Angeles Aqueduct is considered a historical resource for purposes of CEQA. The short segment that intersects the APE includes a large underground, yet partially exposed, concrete pipe and adjacent concrete lined canal that are both contributing elements to the eligible property.

The Los Angeles Aqueduct was previously determined eligible for the NRHP through the Section 106 process and the SHPO has agreed that the eligibility determination is still valid. The Los Angeles Aqueduct is also a historical resource for the purposes of CEQA.

Los Angeles Aqueduct partially exposed concrete pipe, view from near SR-138 towards the north

Big Creek East-West Transmission Line

A 1,000-foot segment of the Big Creek Hydroelectric System East-West Transmission Line intersects SR-138 and the APE south of the Bailey Substation. The Big Creek Transmission Line is eligible for inclusion on the National Register at the State and National level of significance under Criteria A, B, and C as a contributing element to the Big Creek Hydroelectric System Historic District (BCHS Historic District) with a period of significance the same as that of the BCHS Historic District, which is 1911 to 1929. The BCHS Historic District was determined eligible (consensus determination with SHPO) on December 24, 1993. The Big Creek Transmission Line is eligible under Criterion A because it contributed to the events that included construction and operation of a large, complex, and interrelated power system which made possible the development of the Los Angeles metropolitan area. The Big Creek Transmission Line is eligible under Criterion B because it is associated with several individuals who are significant to the past including John S. Eastwood, Henry E. Huntington, and George C. Ward. The Big Creek Transmission Line is eligible under Criterion C because it illustrates and enhances understanding of hydroelectric systems as well as the kind of construction characteristic of such systems. The character-defining features of this transmission line are not stated in the original evaluation of the line, but can be assumed to be the corridor through which it travels; similar to a roadway, fence line, or other linear feature. The steel lattice towers are contributing elements. Non-contributing elements include the conductor wire and insulators which, through routine and regular maintenance, likely have been replaced.

The Big Creek East-West Transmission Line is a contributor to the BCHS Historic District which was determined eligible for the NRHP in 1993 through a consensus determination and the SHPO has agreed that the eligibility determination is still valid. The Big Creek East-West Transmission Line is also a historical resource for the purposes of CEQA.

Big Creek East-West Transmission Line, view towards the east

Antelope-Magunden #2 Transmission Line

A 2,000 foot segment of the Antelope-Magunden #2 (Vincent 220kV/P-19-186876) Transmission Line intersects the APE and SR-138 just east of 140th Street West. The Antelope- Magunden #2 Transmission Line, similar to the Big Creek East-West Transmission Line, is eligible for inclusion on the National Register at the State and National level of significance under Criteria A and C as a contributing element to the BCHS Historic District. Its period of significance is the same as that of the Historic District, which is 1911 to 1929. The Antelope Magunden #2 Transmission Line is eligible under Criterion A for its direct association with the Big Creek Hydroelectric System, as the third high-voltage transmission line constructed from Big Creek to convey electricity to the Los Angeles region. The Antelope-Magunden #2 Transmission Line is eligible under Criterion C for its embodiment of innovative electrical engineering techniques for an electric power conveyance system between 1925 and 1929. The character-defining features of this transmission line are not stated in the original evaluation of the line, but can be assumed to be the corridor through which it travels; similar to a roadway, fence line, or other linear feature. Contributing elements include the steel lattice towers. Non-contributing elements include the conductor wire and insulators which, through routine and regular maintenance, likely have been replaced.

The Antelope-Magunden #2 Transmission Line is a contributor to the BCHS Historic District which was determined eligible for the NRHP in 1993 through a consensus determination and the SHPO has agreed that the eligibility determination is still valid. The Antelope-Magunden #2 Transmission Line is also a historical resource for the purposes of CEQA.

Antelope-Magunden #2 Transmission Line, view towards the north

Los Angeles Department of Water and Power Transmission Line

A 650-foot segment of a LADWP Transmission Line intersects the APE and SR-138 at 120th Street West. The LADWP Transmission Line could not be evaluated because sufficient information was not available during focused archival research, and an evaluation against all four criteria was not possible. Despite extensive outreach to LADWP, the only historical information available was obtained from historical aerial photographs showing that the transmission line is more than 50 years old. The LADWP provided further information in a comment letter submitted during the public review period. The LADWP Transmission Line Rights of Way are integral components of the transmission line system, which provides electric power to the City of Los Angeles and other local communities. Their use is under the jurisdiction of the Federal North American Electric Reliability Corporation (NERC). Caltrans has assumed eligibility under Criterion A of the NRHP for the LADWP Transmission Line, in accordance with Stipulation VIII.C.4 of the 2014 First Amended PA for purposes of this undertaking. The Caltrans Cultural Studies Office (CSO) has no objection to the assumption of eligibility of the LADWP Transmission Line. Since the LADWP Transmission line was assumed eligible and not evaluated, no character defining features of this transmission line were defined. It can be assumed that the character defining feature of the transmission line is the corridor through which it travels; similar to other transmission lines, a roadway, fence line, or other linear feature. The steel lattice towers are contributing elements. Non-contributing elements include the conductor wire and insulators which, through routine and regular maintenance, likely have been replaced.

LADWP Transmission Line, view towards the south

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC), which would then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains would contact the Caltrans District 7 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

Environmental Consequences

The potential for the State Route 138 Northwest Corridor Improvement Project to affect cultural resources is based on the Finding of Adverse Effect for the project (2016) and the analyses in other sections of this EIR/EIS including Appendix B, Section 4(f) Evaluation, as summarized in this section. Consultation with SHPO regarding the Finding of Adverse Effect was initiated in accordance with Section 106 PA Stipulations IX.B and X. SHPO concurred on the Finding of Adverse Effect on April 11, 2017.

In accordance with Section 106 of the NHPA and the implementing regulations, if there are historic properties in the APE that may be affected by a federal undertaking, the agency official shall assess adverse effects, if any, in accordance with the Criteria of Adverse Effect as defined by 36 CFR 800.5. This section describes the results of that assessment, explains why the undertaking was found to have an adverse effect on historic properties, and describes efforts that have and/or would be undertaken to avoid or minimize adverse effects.

The Criteria of Adverse Effect state that "an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" [36 CFR 800.5(a)(1)]. Application of the Criteria of Adverse Effect is largely an assessment of an undertaking's impacts on the historic integrity of a historic property and how an undertaking would affect those features of a historic property that contribute to its eligibility for listing in the NRHP. Effects can be direct, indirect, and cumulative. Direct effects include such actions as physical destruction or damage. Indirect effects include the introduction of visual, auditory, or vibration impacts, as well as neglect of a historic property, or cumulative effects. Cumulative effects are the impacts of the project taken into account with known past or present projects along with foreseeable future projects. Table 65 lists examples of the types of possible adverse effects, as provided by 36 CFR 800.5(a)(2).

Table 65: Examples of Adverse Effects [36 CFR 800.5(a)(2)]

Example Number	Adverse Effect Example
(i)	Physical destruction of or damage to all or part of a property
(ii)	Alteration of a property
(iii)	Removal of the property from its historic location
(iv)	Change to the character of the property's use or of physical features within the property's setting that contributes to its historic significance
(v)	Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features
(vi)	Neglect of a property which causes its deterioration
(vii)	Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance

The following discussion refers to potential impacts under both Alternatives 1 and 2. The No-Build Alternative would have no impact to any of the listed resources.

Archaeological Site SR-049

Archeological site SR-049 lies outside of the area of direct impact (ADI) and would not be adversely affected by the project. For the purposes of this undertaking only, this resource will be treated as eligible for listing on the NHRP under Criterion D and will be avoided with the establishment and enforcement of an environmentally sensitive area (ESA) to avoid adverse effects.

Archaeological Site P19-003723

Archaeological site P19-003723 will be treated as eligible for listing on the NHRP because its subsurface deposits have the potential to yield important information in prehistory. However, the southern portion of the site that lies within and south of the ADI lacks data that contributes to the site's overall significance. Alternatives 1 and 2 each propose to construct a new alignment for SR-138 that would extend approximately 30 feet farther north from the existing SR-138 road shoulder. The northern portion of the site that lies outside of the ADI will not be adversely affected since it will be avoided with the establishment and enforcement of an ESA.

Archaeological Site SRAS-003

Archaeological site SRAS-003 is eligible because its subsurface deposits have the potential to yield important information in prehistory. Alternatives 1 and 2 each propose to construct a new alignment for SR-138 that would extend approximately 415 feet south from the existing SR-138 road shoulder to the northern boundary of SRAS-003. All of SRAS-003 is outside the ADI and will be avoided. Therefore, Alternatives 1 and 2 would have no effect on SRAS-003.

Kinsey Mansion

The Kinsey Mansion faces north overlooking a vast front lawn with ornamentation and statues, a white picket fence, and views of Quail Lake. Access to the property is from a personal driveway with two-point access to SR-138, secured behind fencing and gates. Alternatives 1 and 2 each propose to construct a new alignment for SR-138 which would route through a portion of the Kinsey Mansion property. The new route would cut directly through the Mansion property and impact the white picket fence and large half-circle private driveway, as well as forcing the removal or relocation of iconic lawn ornamentation. Many of the Mansion's character-defining features, including the expansive lawn and ornamentation, which contribute to the Mansion's fashionable Neoclassical eclectic design style, would be physically impacted. Because these alternatives would result in physical alteration to part of the Kinsey Mansion property [36 CFR 800.5(a)(2)(i)j, Alternatives 1 and 2 would result in an adverse effect on the Kinsey Mansion. Proposed mitigation measures have been developed to minimize this impact. SHPO concurrence was obtained on April 11, 2017. (See Appendix I)

Bell Telephone and Telegraph Switching Station

The Bell Telephone and Telegraph Switching Station is a fenced-in complex of buildings adjacent to the south side of SR-138. Access to the complex is via a dirt driveway that connects with SR-138 on the eastern edge of the complex. Alternatives 1 and 2 propose to construct a new alignment for SR-138 several hundred feet north of the existing alignment at the location of the Bell Switching Station. These alternatives would not include construction of any noise abatement feature for noise reduction. Under these alternatives, the Bell Switching Station would remain in its existing condition with character-defining features intact. The Bell Switching Station's significance as a valuable communications network facility for the developing rural regions of Southern California remains intact with no changes and the integrity of its Spanish Revival style of architecture remains high. The Bell Switching Station's importance is not dependent on any view sheds of the area or adjacent access from SR-138. The introduction of the audible element of the new SR-138 route would be minor and consistent with the noise already existing with the current SR-138. Therefore, the audible element of the new SR-138 would have no effect on the integrity of the Bell Switching Station. There would be no adverse effect to the Bell Switching Station with Alternatives 1 or 2. SHPO concurrence was obtained on April 11, 2017. (See Appendix I)

Los Angeles Aqueduct

The Los Angeles Aqueduct consists of two buried concrete pipes underground, one partially exposed, intersecting SR-138 located approximately ¼ mile east of Three Points Road. Alternatives 1 and 2 each propose to construct a new alignment for SR- 138 several hundred feet south of the existing alignment at the location of the Los Angeles Aqueduct. The new alignment would include the construction of a special crossing over the shallow large-diameter pipes, which would not physically touch the pipes.

Under these alternatives, the Los Angeles Aqueduct would remain fully intact and would not be physically altered or removed in any way. The significance of the Aqueduct is not tied to the physical environment around this segment of the Aqueduct or subject to any visual or audial limitations. There would be no adverse effect to the Los Angeles Aqueduct with Alternatives 1 or 2. SHPO concurrence was obtained on April 11, 2017. (See Appendix I)

Big Creek East-West Transmission Line

The Big Creek East-West Transmission Line corridor consists of two parallel transmission lines with steel lattice towers that cross SR-138 approximately ¼ mile southwest of the Bailey Substation and Gorman Post Road. The Big Creek East-West Transmission Line is a contributing element to the Big Creek Hydroelectric System (BCHS) Historic District. Alternatives 1 and 2 each propose to widen the existing SR-138 just east of the Big Creek East-West Transmission Line corridor. The alternatives would require relocation of two to four existing transmission line towers within the APE. Although the transmission towers would be moved, the overall Big Creek East-West Transmission Line corridor would remain intact. The significance of the transmission line corridor is tied with its association to the Big Creek Hydroelectric System. Its' integrity would remain as the tower relocation would be done in a linear route and its associative connection with the BCHS Historic District would not change. It is anticipated that there would be no adverse effect to the Big Creek East-West Transmission Line or the BCHS Historic District as a result of Alternatives 1 or 2. . SHPO concurrence was obtained on April 11, 2017. (See Appendix I).

Antelope-Magunden #2 Transmission Line

The Antelope-Magunden #2 Transmission Line consists of a transmission line with steel lattice towers that crosses SR-138 approximately ¼ mile east of 140th Street West. The Antelope- Magunden #2 Transmission Line is a contributing element to the Big Creek Hydroelectric System (BCHS) Historic District. Alternatives 1 and 2 each propose to widen or realign the existing SR-138 towards the south of the existing alignment at the location of the Antelope-Magunden #2 Transmission Line. The alternatives include avoidance of the single existing Antelope-Magunden #2 transmission Line tower located within the APE leaving it in place and in its current condition. Under these alternatives, the Antelope-Magunden #2 Transmission Line would remain fully intact and would not be physically altered or removed in any way. The significance of the transmission line corridor is tied with its association to the Big Creek Hydroelectric System and its integrity remains as its existing linear route through the area and its physical and associative connection with the BCHS Historic District would not change or be affected in any way. There would be no adverse effect to the Antelope-Magunden #2 Transmission Line or the BCHS Historic District as a result of Alternatives 1 or 2. SHPO concurrence was obtained on April 11, 2017. (See Appendix I)

Los Angeles Department of Water and Power Transmission Line

The Los Angeles Department of Water and Power (LADWP) Transmission Line consists of a transmission line with steel lattice towers that crosses SR-138 at 120th Street West. Alternatives 1 and 2 each propose to widen the existing SR-138 alignment at the location of the LADWP Transmission Line. The alternatives include complete removal of the singular steel lattice transmission line tower located within the APE. The LADWP Transmission Line would remain in its same linear alignment and overall location and setting, as well as retain its association with the development of Los Angeles County. In addition, the design and workmanship of the overall LADWP Transmission Line system would remain intact, despite removal of a single transmission line tower. In all, the LADWP Transmission Line as a whole system would not be altered, destroyed, or changed in any considerable way as a result of the alternatives. There would be no adverse effect to the LADWP Transmission Line as a result of Alternatives 1 or 2. SHPO concurrence was obtained on April 11, 2017. (See Appendix I)

Cumulative Impacts
The Resource Study Area (RSA) is a localized area that may include other planned projects that would have some effect on cultural resources in the project vicinity. This is established for the purpose of the cumulative impacts analysis. Usually the RSA is larger than the APE because it looks at a broader potential for cumulative impacts. The APE includes most parcels that are adjacent to the existing Caltrans right of way. However, where parcels extend a great distance away from the highway, only the portion of the parcel directly adjacent to the highway was included.

As a result of the project archaeological survey, ten prehistoric archaeological sites and six archaeological resources from the historic period that required evaluation were identified. Seven of the prehistoric sites are lithic reduction sites. The other three prehistoric sites are located in or near the western end of the Antelope Valley. Two are lithic scatters and one is a temporary camp. One lithic reduction site (which also had evidence for overnight stays) and two temporary camps are evaluated as eligible for the NRHP and are historical resources for the purposes of CEQA. The temporary campsite is evaluated as a historic property eligible for the NRHP and is also considered a historical resource for the purposes of CEQA. One of the lithic reduction sites and a portion of a second are to be treated as NRHP-eligible (and CRHR-eligible) for the purposes of the undertaking only. The archaeological sites from the historic period include three farming sites with irrigation features, structure foundations, building material, and domestic refuse; two roads; and a World War II landing field used for training. None of the archaeological resources from the historic period are evaluated as eligible for the NRHP and they are not historical resources for the purposes of CEQA. The APE was surveyed for both built environment resources and archaeological resources. From the finding of effect for the nine (9) properties eligible for the NRHP, it appears that only the Kinsey Mansion would be adversely affected by the proposed project.

Reasonably Foreseeable Actions and Their Impacts
The Centennial Specific Plan and Project and AV Solar Ranch One are both within the Cultural Resource Study Area (RSA).

The Centennial Specific Plan and Project would incorporate mitigation measures to reduce all direct and indirect impacts to a less than significant level. Impacts to cultural resource sites would be mitigated through avoidance by means of construction monitoring, preservation through restricted access or, if that is not feasible through data recovery. As a result, all impacts to these resources are anticipated to be reduced to a less than significant level.

The AV Solar Ranch One was completed in April 2014. Operations would increase the number of people in close proximity to archaeological resources and thus increase potential impacts from unauthorized artifact collection, looting, or other intentional or unintentional disturbance to archaeological sites. However, the impacts would be reduced to a less than significant level through implementation of mitigation measures.

Neither of the aforementioned projects would result in an adverse impacts to cultural resources in the RSA.

The SR-138 Northwest Corridor Improvement Project would incorporate the measures listed in the section below to reduce the adverse effect on the Kinsey Mansion, and other cultural resources in the RSA. Cumulative impacts to cultural resource are not anticipated to be substantial.

Avoidance, Minimization, and/or Mitigation Measures
A project-specific Programmatic Agreement was executed on June 23, 2017 to establish a phased identification and evaluation process for archaeological resources once access is granted and to identify measures to address impacts to the Kinsey Manor.

CUL-1: Caltrans will develop a research design for the prehistory of the Antelope Valley that provides an archaeological context as well as prehistoric and historic-era research themes and questions appropriate to known site types within the valley proper. The research design will serve as guidance for future archaeological investigations in the region.

CUL-2: An Environmentally Sensitive Area (ESA) Action Plan will be developed to ensure the avoidance and protection of historic properties/historical resources during project construction. The ESA Action Plan details the protective measures to be employed at various states of the project (before, during, and after construction) and identifies the parties responsible for the implementation of the measures, which include the placement of protective fencing. The ESA Action Plan will be included in the Resident Engineer (RE) pending file.

CUL-3: Caltrans will develop a Historic Properties Treatment Plan (HPTP) with delineation of archaeological monitoring areas (AMAs) for locations with the highest geoarchaeological sensitivity. If unanticipated discoveries occur during archaeological monitoring, Caltrans will implement the procedures outlined under the PRDM Plan.

CUL-4: Caltrans will provide project design plans to the State Historic Preservation Officer (SHPO) for review and comment for the retaining wall, fencing, and relocated driveway associated with the Kinsey Mansion to ensure conformance with the Secretary of Interior's Standards for the Treatment of Historic Properties. Specifically, fencing visually similar to the original fencing would be installed at the mansion and a retaining wall at this location would be treated with a rustic rock finish, including color.

CUL-5: Caltrans will create electronic content for a smartphone traveler application that describes and interprets the historic and cultural properties along the State Route 138, between Interstate 5 and State Route 14.

3.2 PHYSICAL ENVIRONMENT

3.2.1 HYDROLOGY AND FLOODPLAIN

Regulatory Setting

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

Affected Environment

Existing data sources used to prepare this section were taken from the *Draft Preliminary Drainage Report, Northwest 138 Corridor Improvement Project (Volumes 1A, 1B, and 2),* (Kimley Horn, 2015).

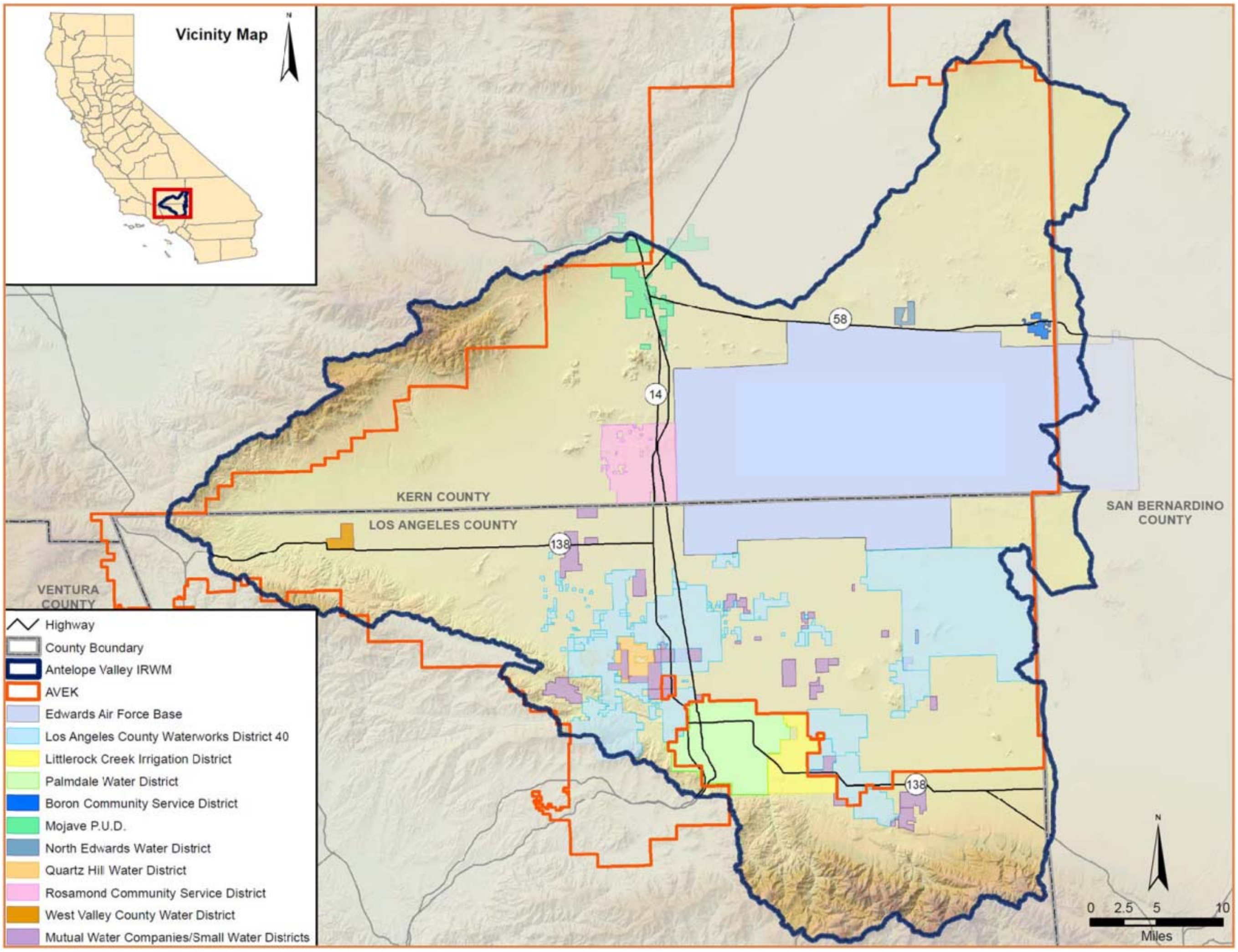
<u>Existing Hydrology</u>

The SR-138 improvements extend west to east across the Antelope Valley Watershed (see Figure 29). The valley is generally characterized by flat, sandy terrain with widely scattered hills and isolated peaks comprised of erosion resistant bedrock formations. The valley is bounded on the south by the southeast trending San Andreas Fault zone and the Transverse Ranges. Drainage across the valley area is generally to the northeast and east. The western portion of the alignment crosses the San Andreas Fault zone and is located in the foothills of the Transverse Ranges.

The majority of the SR-138 project area is within the Lancaster and Neenach sub-watersheds of the Antelope Valley Watershed. The west end of the area, at the intersection of I-5 and SR-138, is within the Hungry Valley of the Piru sub-watershed, which is part of the larger Santa Clara River watershed. This area discharges to Quail Lake and then to Pyramid Lake via Lower Quail Canal and Gorman Creek. Pyramid Lake is located approximately five miles south of the interchange of SR 138 and I-5. The ultimate receiving water body for this project is the Pacific Ocean via the Santa Clara River.

Relief over the majority of the alignment is minor with a gradual elevation loss towards the east. The total elevation difference along the SR-138 project corridor is approximately 1,090 feet. The highest point along the alignment is approximately 3,410 feet above sea level at the eastern end of the Quail Lake Sky Park Airport while the lowest point is at the interchange of SR-138 and SR-14 with an elevation of approximately 2,320 feet.

Figure 29 Antelope Valley Watershed Area Map



Source: Antelope Valley IRWMP

The Antelope Valley Watershed is a closed basin with no outlet to the ocean. Water discharges to Amargosa Creek and eventually to Rosamond Dry Lake, which is located approximately four miles northeast of the interchange of SR-138 and SR-14. Along the alignment of the proposed improvement the valley drains to the northeast and east. No substantial streams are present in the project area; however numerous unnamed drainages descend from the mountains along the southerly margin of the valley and pass under SR-138. Most of these drainages do not experience flow except during heavy rainfall and are not confined to manmade channels. Scour potential, which occurs with the passage of one or more flood events or site-specific hydraulic conditions that may be natural or human-caused origin, exists at these locations during flash flood conditions, and may cause channel degradation due to the excessive forces associated with extreme flow events.

Climate

The climate of the project region is arid with an average annual high temperature is about 76°F. The hottest months are June through September when high temperatures average about 95°F and low temperatures average about 58°F. Coolest temperatures occur in the winter months of December and January when the average high is about 56°F and average low is 30°F. Extreme low temperatures occur from November to March when freezing is possible. Snowfall is possible from December through March with an annual average up to about seven inches of snow during these months. The maximum recorded snowfall of 27 inches was recorded in 1916. Annual precipitation is about 7.4 to 8.5 inches with most of the rain falling between December and February. The driest months are June, July, and August when rainfall is generally less than 0.1 inch per month. Monsoon-type rains occasionally occur during the summer months and cause local flooding.

Soil Types

The SR-138 improvements extend west to east across the Antelope Valley between I-5 and SR-14. The Antelope Valley is generally characterized by flat, sandy terrain with widely scattered hills and isolated peaks comprised of erosion resistant bedrock formations. The valley is bounded on the south by the southeast trending San Andreas fault zone and the Transverse Ranges. Drainage across the valley is generally to the northeast and east. The western portion of the alignment crosses the San Andreas fault zone and is located in the foothills of the Transverse Ranges. The condition and type of soil are major factors affecting infiltration and runoff. The Natural Resources Conservation Service (NRCS) has classified soils into four general categories, A, B, C, and D for comparing infiltration and runoff rates. The categories are based on properties that influence runoff, such as water infiltration rate, texture, natural discharge and moisture condition. The runoff potential is based on the water runoff at the end of a long-duration storm that occurs after wetting and swelling of soil not protected by vegetation. According to the NRCS, the soil types on the western third of the project consist mainly of Oak Glen, Gorman, and Chino series soil and range from hydrologic soil group (HSG) B to C. The middle third of the project consists mainly of Greenfield, Hanford, and Oak Glen series soil, with the majority of the soils are in HSG B. The eastern third of the project consists mainly of Greenfield, Hesperia, Pond-Oban Complex, Romona, Rosamond series soils and are predominately in HSGs A and B, with less than 30% in HSG C.

Location of the Project Relative to Designated Floodways

Flood Insurance Rate Map (FIRM) panels are provided in the *Draft Preliminary Drainage Report* and are summarized in Table 66.

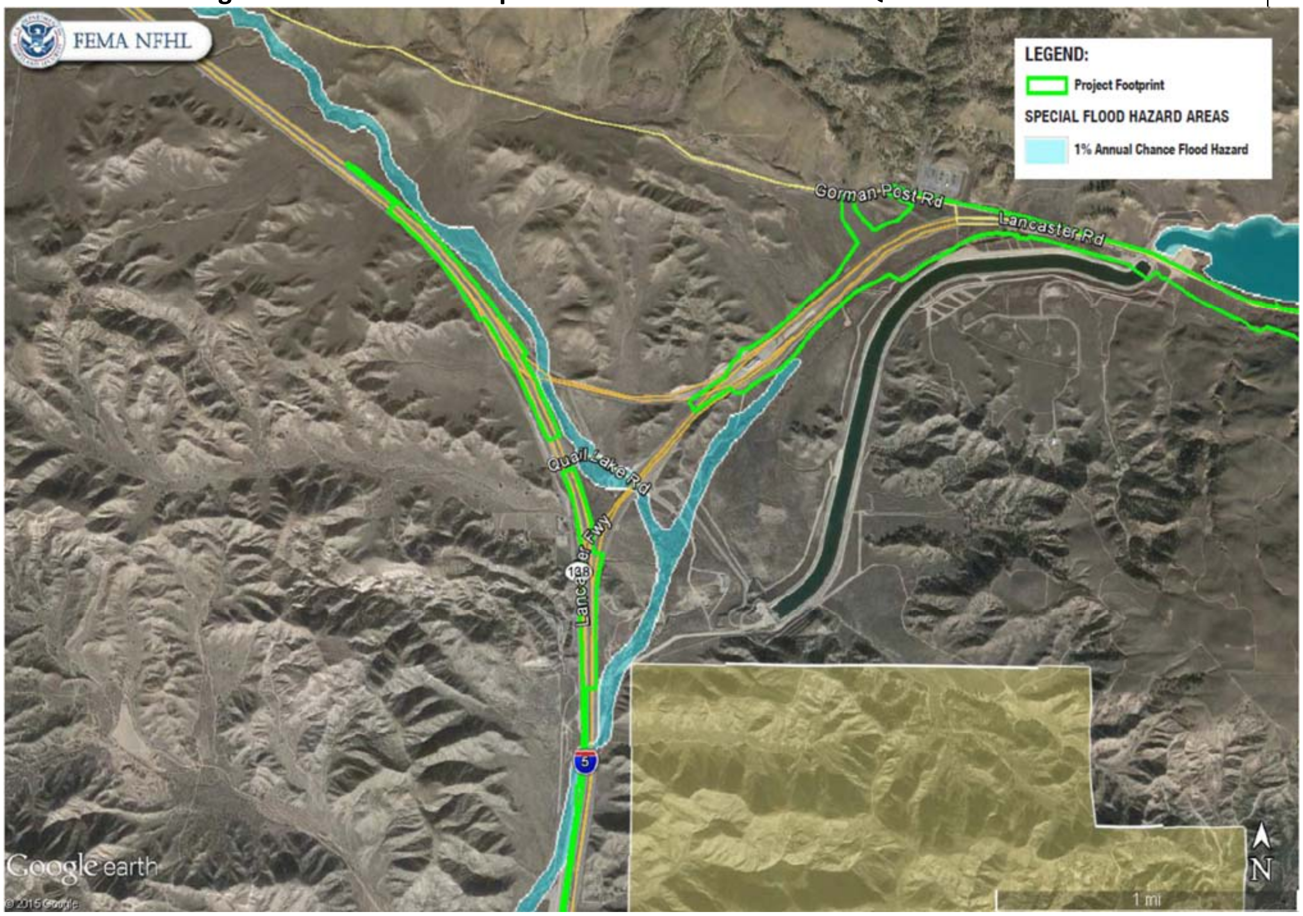
Table 66: Flood Insurance Rate Map Panels within the SR-138 Project

Flood Map No.	General Area	Flood Zone
06037C0050F	Gorman Creek and Quail Lake at I-5	A
06037C0075F	South of Kern County line to Quail Lake	A
06037C0100F	Three Points Road	A
06037C0125F	170th Street West	A
06037C0150F	110th Street West	A
06037C0175F	SR-14/SR-138 Interchange	A

Source: Kimley-Horn and Associates, Hydraulics/Drainage Report, June 2015

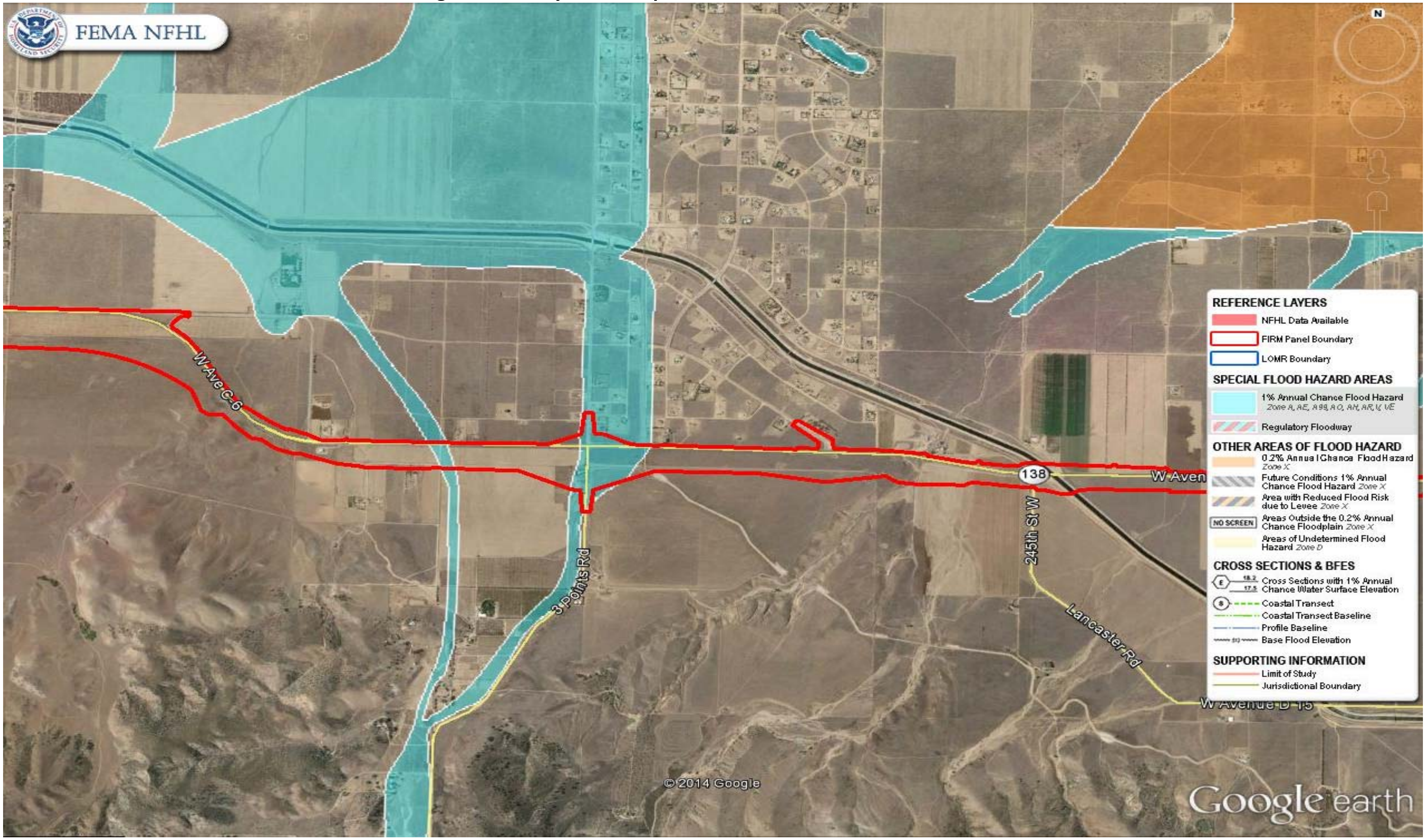
A preliminary floodplain analysis indicates that the project segment of SR-138 is within flood zone A. As defined by Federal Emergency Management Association (FEMA) Flood Insurance Rate Maps (FIRMs): Zone A: areas of 100-year flood, base flood elevations, and flood hazard factors not determined. The source of flows in the ephemeral, intermittently flowing streams is storm water runoff and sheet flow from nearby hillsides. These flows can be concentrated in canyons and washes to create short-term flood impacts. The FEMA FIRMs provided below show the limits of the 100-year floodplains within the project footprint (Figures 30 through 34). Limits of floodplain are shown in blue and the project footprint is shown in green.

Figure 30 100-Year Floodplain near Gorman Creek and Quail Lake at I-5



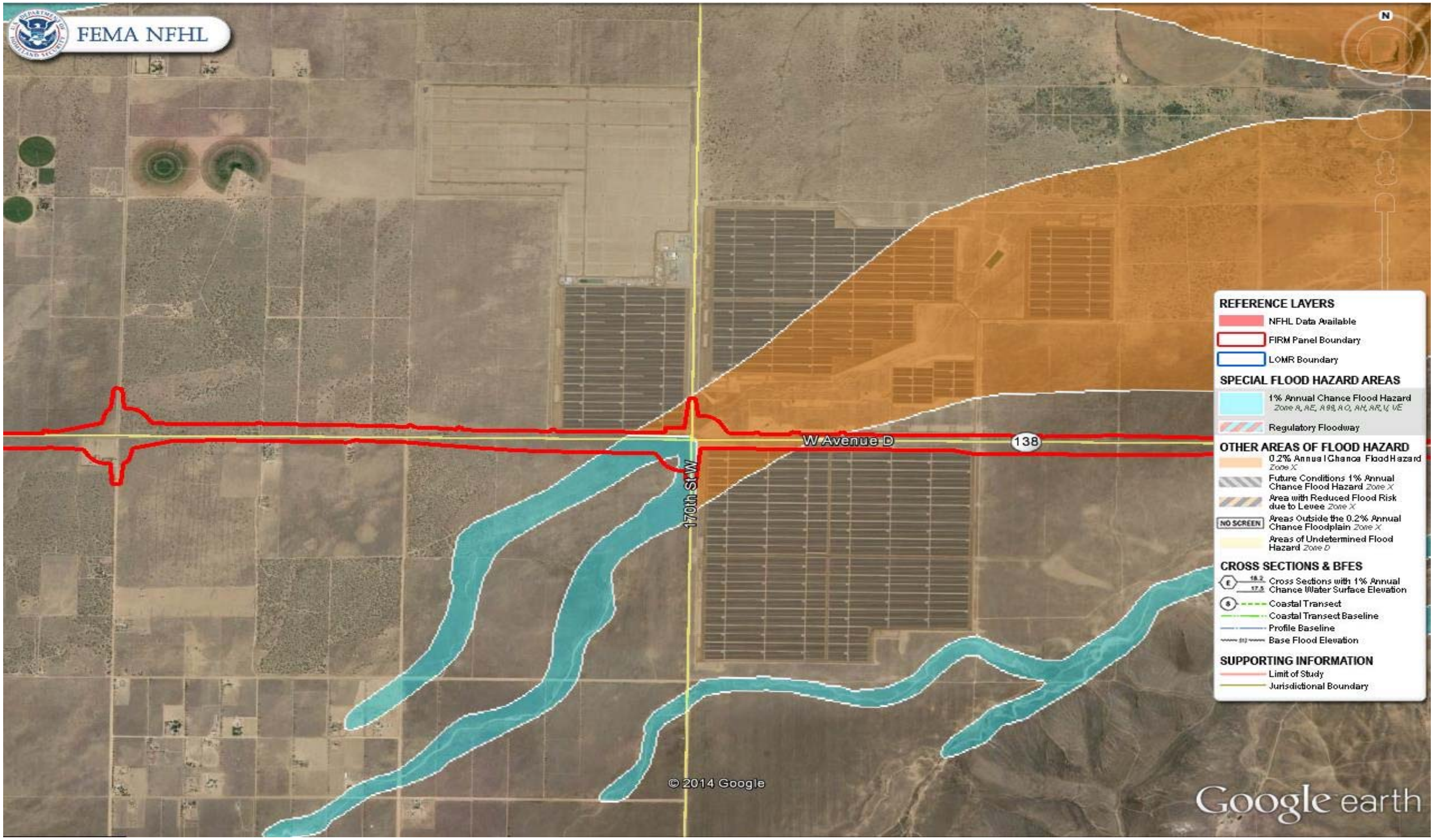
Source: Google Earth and FEMA

Figure 31 100-year Floodplain near Three Points Road



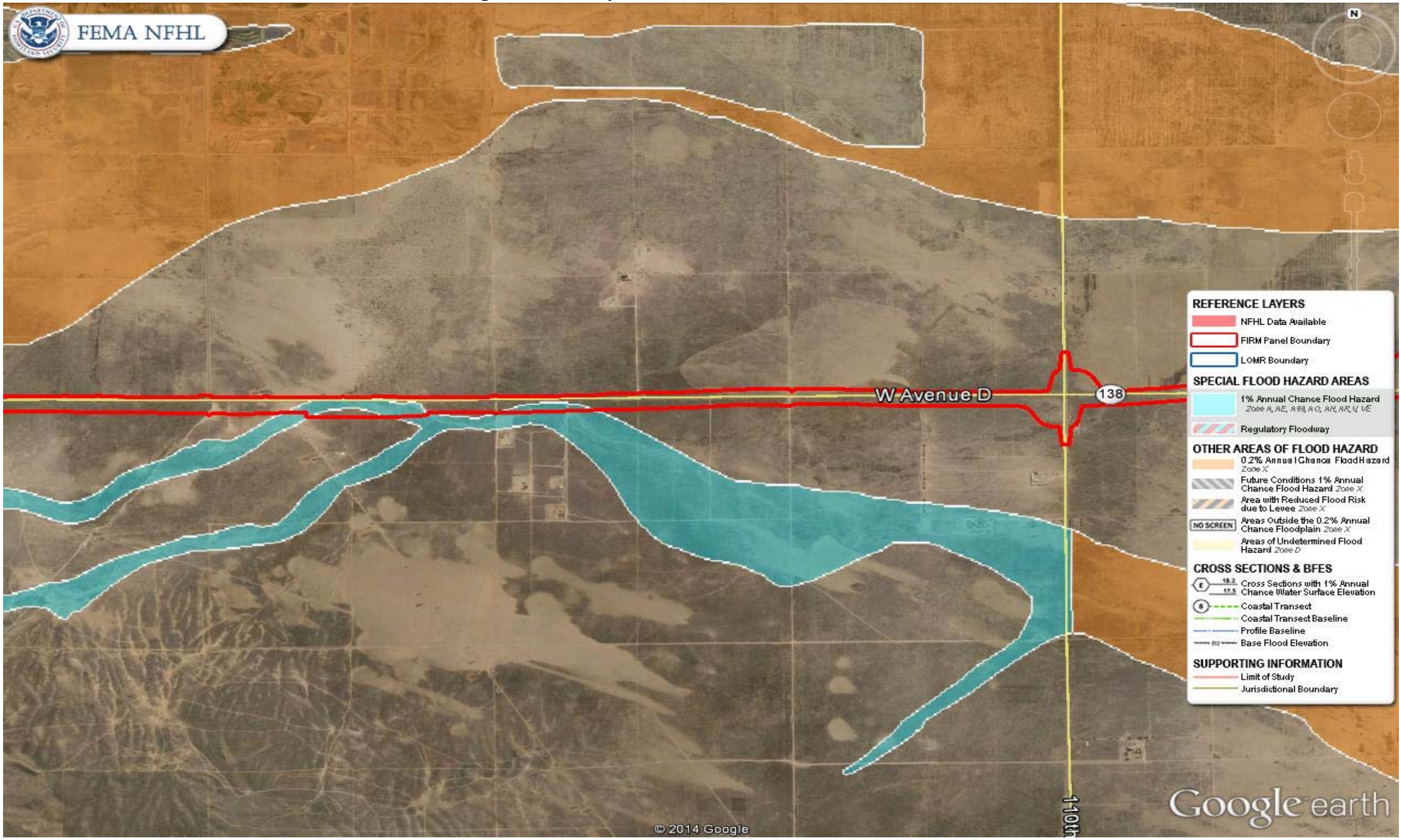
Source: Google Earth and FEMA

Figure 32 100-year Floodplain near 170th Street West



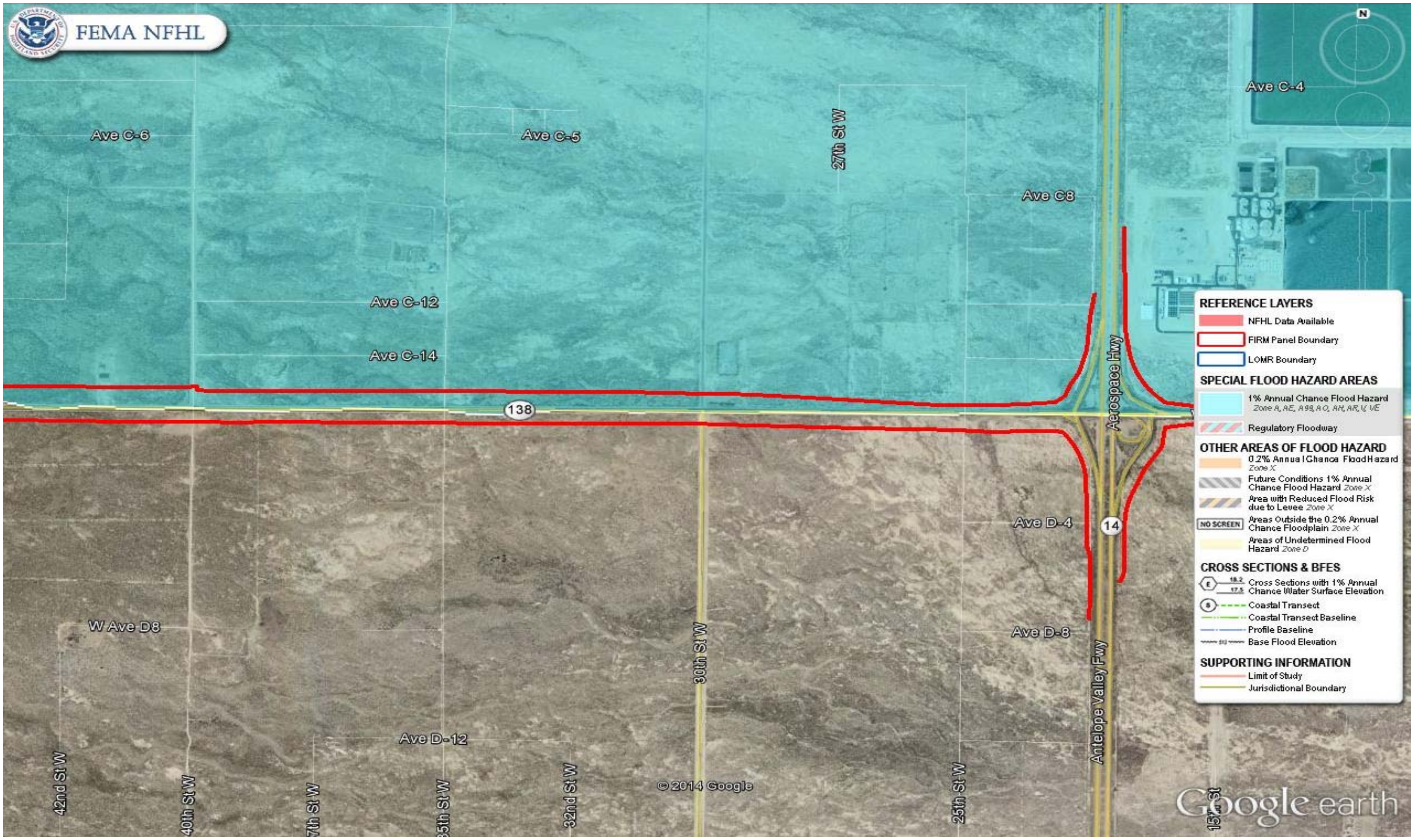
Source: Google Earth and FEMA

Figure 33 Floodplain near 110th Street West



Source: Google Earth and FEMA

Figure 34 Floodplain near SR-138 and SR-14 Interchange



Source: Google Earth and FEMA

No Build Alternative
Implementation of the No-Build Alternative would maintain the existing configuration of SR-138, and would not result in improvements to SR-138. The No-Build Alternative provides a baseline for comparing the impacts associated with the Build Alternatives. Therefore, no impacts to hydrology and floodplain would occur under the No Build Alternative.

Alternative 1 (Freeway/Expressway)
Alternative 1 (Freeway/Expressway) would include a six-lane freeway from the I-5 interchange to 300th Street West, and a four-lane expressway from 300th Street West to the SR-14 interchange generally following the existing alignment of SR-138.

All existing cross culverts along the corridor would be replaced with new culverts where roadway improvements are proposed. In addition to the cross culverts, the proposed drainage system also includes roadside ditches, spillway, drainage inlets, culverts that connect inlets to cross culverts or outfalls, and ditches at the top of cut slopes (brow ditches) and beyond the toe of fill slopes to intercept off-site runoff. The system was designed to capture and convey roadway runoff and allow passage of off-site runoff underneath and across the proposed roadway. On-site drainage culverts and roadside ditches were sized using a 25-year storm event. Culverts that cross under County of Los Angeles major/secondary highways shall be designed to provide for a 50-year storm event per the County of Los Angeles Hydrology Manual. Figure 35 shows a typical cross section of the proposed roadway facility with roadside ditches in both cut and fill situations.

The drainage pattern on the western portion of the corridor is different than that on the eastern portion. Between I-5 and approximately 1,000 feet east of 140th Street West (Post Mile 25.5), off-site runoff generally flows from south to north or northeast. Off-site runoff in the form of overland flow or concentrated flow in natural streams would be intercepted by a ditch located east of the roadside ditch. This ditch would convey the concentrated flows to a proposed cross culvert that crosses under SR-138. Headwall structures would be required for the larger diameter culverts and flared end sections would be used for smaller diameter culverts. The downstream end of the proposed cross culverts would be located near where the existing cross culverts discharge in order to preserve the existing drainage pattern. An energy dissipation device such as riprap or concrete lined spillway would be proposed at the storm drain outfall, beyond which the runoff would leave the project site as overland flows. Roadway runoff would be collected in roadside ditches or median ditches and captured in cross culverts or drainage inlets in the median. Drainage inlets would be connected eventually to the cross culverts via a system of smaller diameter drainage culverts.

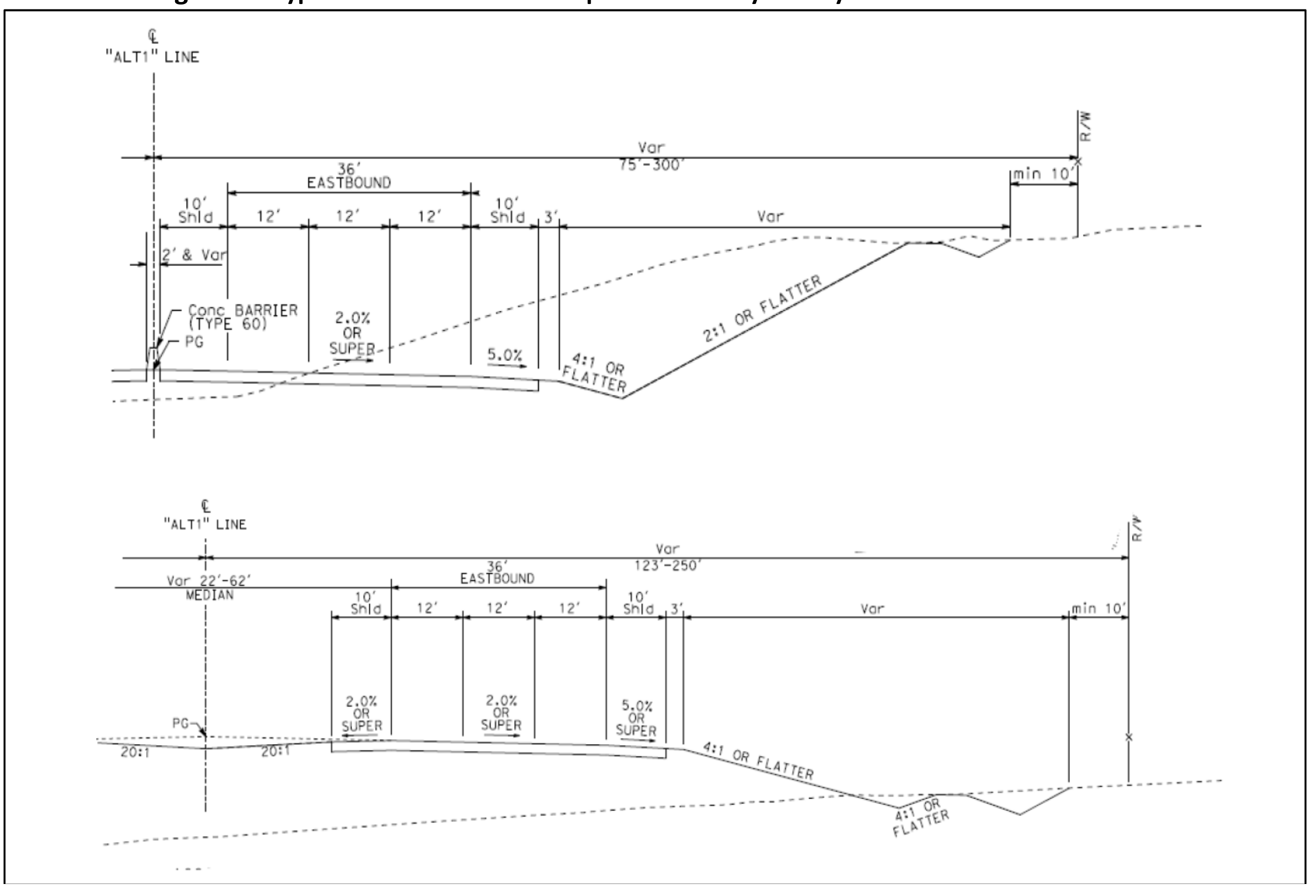
In the eastern reaches of the proposed SR-138, from approximately PM 26+ to PM 37+, the drainage primarily consists of shallow unconfined sheet flow conditions. The northern edge of the proposed roadway is adjacent to a floodplain that drains the adjacent lands in an easterly direction towards SR-14. The roadway is proposed to be elevated approximately two to three feet above the adjacent ground to protect the roadway from potential flooding and to confine the flows and prevent overtopping of the roadway. No drainage crossings are being proposed to convey any significant drainage under or across the roadway in this area.

A Natural Resources Conservation Service (NRCS) Web Soil Survey identifies the soils within this portion of the corridor as being with Hydrologic Soil Groups (HSGs) A, B and C. In addition, the area is being identified as predominately HSGs A and B, with less than 30% in HSG C. This indicates that the soils in the majority of this area have high (HSG A) and moderate (HSG B) infiltration rates when saturated. During final design the roadside ditches would need to be properly sized to account for more accurate rates of infiltration.

A channel-realignment would be required on the south side of the proposed SR-138 between 140th Street West and 130th Street West. Rock slope protection would need to be installed on the west side of the realigned channel to ensure slope stability adjacent to the SR-138 roadway embankment.

Alternative 1 has the largest impact footprint among all three build alternatives and therefore it is anticipated to have the greatest impacts to the existing drainage system. The recommended measures to minimize impacts to the existing drainage system include Storm Water Treatment Best Management Practices (BMP), a Storm Water Data Report (SWDR), and Storm Water Management Plan (SWMP). With implementation of all mitigation measures identified in the Avoidance, Minimization, and Mitigation Measures discussion at the end of this section, and with implementation of BMP’s, direct impacts associated with Alternative 1 would not be adverse.

Figure 35 Typical Cross Sections of Proposed Roadway Facility with Roadside Ditches



Alternative 2 (Expressway/Limited Access Conventional Highway)

Alternative 2 (Expressway/Highway) would include a six-lane expressway from the I-5 interchange to the 300th Street West, a four-lane expressway from 300th Street West to 240th Street West, and a limited access Conventional Highway from 240th Street West to the SR-14 interchange, generally following the existing alignment of SR-138.

The proposed drainage improvements for Alternative 2 are similar to those for Alternative 1 because they share the same horizontal and vertical alignments as well as typical cross sections over the majority of the corridor. Therefore, separate drainage concept plans were only developed for Alternative 2 at locations where the designs of the two alternatives are drastically different. Those locations include intersections at Cement Road, 300th Street West and the interchange at SR-14.

Therefore, considering impacts to Alternative 2 would be similar to impacts to Alternative 1, the recommended minimization measures for Alternative 1 to the existing drainage system, i.e. BMPs, SWDR, SWMP, would also be used for Alternative 2. See the Avoidance, Minimization, and Mitigation Measures section below. Therefore, with implementation of recommended measures, BMP's and development of a SWMP, direct impacts associated with Alternative 2 would not be expected to be adverse.

Significant Encroachment

SR-138 encroaches floodplains delineated based on the approximate 100-year flood event. The analysis completed to date indicates that there would not be a significant encroachment as defined in 23 CFR 650.105. The project's impact on flood potential has been evaluated as part of the *Draft Preliminary Drainage Report, Northwest 138 Corridor Improvement Project (Volumes 1 and 2),* prepared by Kimley-Horn (January, 2015). One of the objectives of the report is to facilitate a future flood map revision through the National Flood Insurance Program (NFIP) administered by the Federal Emergency Management Agency (FEMA). Because a significant encroachment was not identified, an "Only Practicable Alternative Finding" is not required.

Pursuant to Executive Order (EO) 11988, the floodplain risk assessment would be circulated to the public for early review and comment, and would be filed with the State Clearinghouse. References to all encroachments on the base floodplain would be included in the public notices, and would be identified at public hearings. Therefore, direct impacts associated with encroachment would not be expected to be adverse and mitigation would not be required.

Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act (CEQA) Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA

Guidelines. A definition of cumulative impacts under the National Environmental Policy Act (NEPA) can be found in 40 *Code of Federal Regulations* (CFR) Section 1508.7 of the Council on Environmental Quality (CEQ) Regulations.

Cumulative impacts identified for the segment of SR-138 are those impacts that result from past, present, and reasonably foreseeable future actions within the cities of Palmdale and Lancaster, as well as unincorporated Los Angeles County. Past projects in the area have included residential, commercial, industrial, and highway development. Other present and reasonably foreseeable future projects are listed in the SCAG 2012-2035 RTP/SCS, as well as in Table 110 in Section 3.3.1 (Natural Communities).

Hydrology and floodplain improvements would not result in cumulative impacts because all impacts would be fully mitigated with implementation of the project as discussed the Avoidance, Minimization, and/or Mitigation Measures section. Therefore, with implementation of mitigation measures HYDRO-1 through HYDRO-4 below, cumulative impacts would not be adverse.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimization measures would be implemented during construction to avoid or minimize potentially adverse hydrological impacts. Standard BMPs would also be incorporated into the project to minimize the effects of water run-off during construction and operation.

HYDRO-1 All storm drain outlets would have appropriate energy dissipation prior to discharging into natural water courses to minimize the potential for erosion. These energy dissipaters would consist of riprap aprons at the foot of all storm drain headwall outlets and down drains discharging to natural water courses. The riprap aprons would be appropriately sized based on the velocity of flow at the outlet and in accordance with *the California Bank and Shore Rock Slope Protection Design Manual (October 2000)*.

The following measures are recommended to minimize water quality impacts:

HYDRO-2 **Protect River from Toxic Discharge.** The contractor shall be required to follow pertinent paragraphs of the Caltrans manual, California Standard Specifications, Section, 7 – 1.01G which begins, "The contractor shall exercise every reasonable precaution to protect streams from pollution with fuels, oils, bitumen, calcium chloride, and other harmful materials". Construction byproducts and pollutants such as oil, cement, and wash-water shall be prevented from discharging into the stream and shall be collected and removed from the site. No equipment may be parked within the immediate watershed of the stream channel. Equipment may be refueled and serviced at an "equipment laydown" area out of the immediate watershed of the Santa Clara River or the canals that drain to a river.

HYDRO-3 **Control Erosion.** Silt fencing (or filter fabric) shall be used to catch any short-term erosion or sedimentation that may inadvertently occur. Measures may include but not be limited to the use of sediment basins, hay bales and/or silt fences. This requirement corresponds to California Standard Specifications, Section 7-1.01G, "Where working areas encroach on live streams, barriers to adequately protect the flow of muddy water into streams shall be constructed and maintained between working areas and streams . . ." Ditches should be installed at the top of the cut/toe of fill areas and the bare slopes should be revegetated with non-invasive, native vegetation found within the project study area.

HYDRO-4 **Build Cofferdams.** Using non-erodable, clean materials, cofferdams or temporary berms shall be built to keep construction activities out of the live stream. Water from these construction envelopes shall be transported off-site or pumped to sediment or percolation basins. The dams or berms shall not impede the movement of fish at any time. Before the first heavy rains, sediment basins shall be cleaned of accumulated debris and the debris transported outside the area for disposal.

3.2.2 WATER QUALITY AND STORM WATER RUNOFF

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[3] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge would comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into Waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into Waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE’s Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency’s (U.S. EPA) Section 404 (b)(1) Guidelines (U.S. EPA Code of Federal Regulations [CFR] 40 Part 230), and whether the permit approval is in the public

[3] A point source is any discrete conveyance such as a pipe or a man-made ditch.

interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[4] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act
California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. The project area straddles the regional boundary between two RWQCBs. The majority of the project area is under jurisdiction of the Lahontan RWQCB, and the western portion of the project area is under jurisdiction of the Los Angeles RWQCB. Details about water quality standards in a project area are included in the Water Quality Control Plan for the Lahontan Region and the Water Quality Control Plan for the Los Angeles Region (Basin Plans). Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

[4] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

State Water Resources Control Board and Regional Water Quality Control Boards
The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **National Pollution Discharge Elimination System (NPDES) Program**

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified the Department as an owner/operator of an MS4 under federal regulations. The Department's MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans' MS4 Permit No. CAS000003, Order No. 2012-0011-DWQ, as amended by order WQ 2014-0006-EXEC, order WQ 2014-0077-DWQ, and order WQ 2015-0036 EXEC, came into effect on July 1, 2013 contains these basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);

2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project would be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-0009-DWQ) adopted on September 2, 2009, as amended by 2010-0014-DWQ and 2012-006-DWQ, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for severe water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Affected Environment

Los Angeles County Antelope Valley Area Plan

The Los Angeles County Department of Regional Planning Antelope Valley Area Plan was developed in June 2015 to achieve the communities' shared vision of the future through the development of specific goals, policies, land use and zoning maps, and other planning instruments. The Conservation and Open Space Element of the Antelope Valley Area Plan includes a policy to limit the amount of development in groundwater recharge areas through appropriate land use designations with very low residential densities. This element also includes a policy to encourage sustainable water quality best management practices such as runoff detention basins and the use of vegetation filter strips.

Water Resources

The following discussion incorporates the results of a Water Quality Assessment Report (WQAR) and the jurisdictional delineation prepared for the project. The jurisdictional delineation included field surveys from March 17 to March 20, 2014, and a delineation of wetlands was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE, 2008).

The project area extends west to east across the Antelope Valley. The valley is bounded on the south by the southeast trending San Andreas Fault zone and the Transverse Ranges. Drainage across the valley area is generally to the northeast and east. The western portion of the alignment crosses the San Andreas Fault zone and is located in the foothills of the Transverse Ranges. Waterways in the project area include ephemeral streams, seasonal pools, un-vegetated channels, Gorman Creek, Quail Lake, and the California Aqueduct. Gorman Creek supports a riparian plant community and is part of a regional stream corridor that traverses many habitat types.

The majority of the project area is located within the Antelope-Fremont Valleys Watershed, with only the far west end lying within the Santa Clara Watershed (see Figure 36). Within the project area, the Antelope-Fremont Valley Watershed extends approximately from Old Ridge Route Road east to the end of the project area at the SR-138/SR-14 interchange. All of the drainages recorded within the Antelope-Fremont Valleys Watershed within the project area are thought to be isolated and flow toward the three dry lakes on Edwards Air Force Base. Except during the largest rainfall events of a season, surface water flows quickly percolate into stream beds and recharge the groundwater basin. Surface water flows that reach the dry lakes are generally lost to evaporation.

All of the streams located in the Antelope-Fremont Valley Watershed portion of the project area are ephemeral. An ephemeral stream has flowing water only during and for a short period after precipitation events in a typical year. Groundwater is not a source of water for the streams, but rather, the streams are primarily supported by runoff from rainfall.

Several types of ephemeral streams are located in the project area, including natural drainage features of varying sizes and man-made drainage channels. Both types of features support similar types of indicators of hydrology, and their main differences are in the morphology. Man-made features tend to have a more defined bed and bank than natural features and run immediately parallel to roadways. Natural features in the project area often connect with man-made features that consist of a drainage trench created to reduce roadway flooding.

Based on site-specific field observations as well as regional factors, the man-made features likely perform the following functions in the watershed: energy dissipation, infiltration of floodwaters, and retention of particulates. These features do not support a unique plant community or a spatial habitat structure useful to local fauna for forage or cover. Indicators of hydrology that were observed include riverine sediment deposits, drift deposits, drainage patterns, and defined channels and banks. The characteristics observed within these features suggest that they channel surface water, and therefore are likely jurisdictional as waters of the state and regulated by the RWQCB and CDFW.

Seasonal pools associated with drainage channels were mapped as jurisdictional. These features are in depressional areas that concentrate water from defined upslope channels, but also have downstream channels with ordinary high water mark (OHWM) indicators (demarcating the extent of federal jurisdiction in non-tidal waters of the U.S.).

Non-jurisdictional features in the project area include man-made, un-vegetated channels and un-vegetated roadside ditches. These features also flow ephemerally during and shortly after rain events. One unique feature is the California Aqueduct, which crosses the project area at approximately 245th Street West and SR-138. As a conveyance that is part of the California State Water Project, the aqueduct is entirely manmade with neither a headwaters nor a natural flow path. Water flows are entirely dependent on human intervention, and they terminate within manmade reservoirs or other artificial features. Therefore, the aqueduct is not considered a natural feature and is non-jurisdictional to either state or federal entities.

The portion of the project area in the Santa Clara Watershed includes several waterways, including non-wetland waters and streambeds, Gorman Creek, and the Quail Lake Spillway/West Branch of the California Aqueduct.

Local Hydrology

The project area is located within two Hydrologic Units (HU), the Santa Clara-Calleguas HU on the west (Santa Clara River watershed) and the Antelope HU on the east. The details for the hydrologic units in the project area are summarized in Table 67.

Table 67: Hydrologic Units in Project Area

Portion of Project Area	Hydrologic Unit	Hydrologic Area	Hydrologic Sub-Area (HSA)	HAS Number
PM 0.0 to PM 2.4	Santa Clara - Calleguas	Piru	Undefined	403.43
PM 2.4 to 27.7	Antelope	Neenach	Undefined	626.40
PM 27.7	Antelope	Lancaster	Undefined	626.50

Source: Metro and Caltrans District 7, 2015

From PM 0.0 (I-5) to PM 2.4, the project is within the Santa Clara-Calleguas HU and the Piru Hydrologic Area, Sub-Area 403.43. This area discharges to Quail Lake and then to Pyramid Lake from the Lower Quail Canal and Gorman Creek. Pyramid Lake is located approximately five miles south of the SR-138/I-5 interchange. The ultimate receiving water body for this portion of the project area is the Pacific Ocean from the Santa Clara River.

From PM 2.4 to 27.7, the project is within the Antelope HU and the Neenach Hydrologic Area, Sub-Area 626.40. There is no identified water body for this sub-area according to the Lahontan RWQCB Basin Plan. From PM 27.7 to 36.8 (SR-14), the project is also within the Antelope HU and the Lancaster Hydrologic Area, Sub-Area 626.50. This area discharges to Amargosa Creek and eventually to Rosamond Dry Lake in the Mojave Desert. Rosamond Dry Lake is located approximately four miles northeast of the SR-138/SR-14 interchange.

The collective watersheds that drain to SR-138 and regions that may overflow to SR-138 (i.e., near the SR-138/SR-14 interchange) is an expansive area. The cumulative drainage area is approximately 548 square miles (mi^2), 29 mi^2 of which is identified as the Gorman Creek Watershed (to the west) and 519 mi^2 to the east towards SR-14.

Non-Wetland Waters and Streambeds

Non-wetland features in the project area are predominantly natural, un-vegetated channels bisecting undeveloped areas. In contrast to the features within the Antelope-Fremont Valley Watershed, only minor portions of the features identified in the Santa Clara Watershed are associated with road infrastructure. Features within the watershed, east of Quail Lake, consist of channels with OHWM indicators connected by culverts under SR-138. The upstream portions of the channels to the south of SR-138 are likely jurisdictional and regulated by RWQCB, CDFW, and USACE.

Several smaller streams traverse the project area west of Quail Lake. Most of these features are the result of local ephemeral streams that drain local hills and canyons during storms, and many have been altered and re-directed during road and highway construction. These also include conveyances for local runoff and immediate flood control for highway features, such as a concrete v-ditch along I-5 and SR-138. These features typically convey runoff for local storm events and are only considered to be active for the duration of the storm event itself and for a short time afterwards. They vary in length from less than 200 feet to over 2,000 feet, and their flows all eventually reach Gorman Creek.

Most of the natural bottom ephemeral streams support little to no vegetation, and vegetation that is present consists primarily of upland species. The drainage bottoms for all of these features are dominated by a scoured surface with defined bed and banks. The flows within some of the features are infrequent enough that various grasses and forbes, or even shrub species, encroach upon the drainage bottom. Surrounding vegetation consists of various shrub species, such as California buckwheat, white sage, and rabbitbrush, with an understory of nonnative grasses. The concrete v-ditch that is present supports no vegetation, except for a few herbaceous species that have been able to grow on deposited sediment.

The drainage area for most of these features is relatively small and consists of upland shrub and grassland vegetation. Downstream flows from these features enter into Gorman Creek. Since the features are relatively small, and do not support riparian plant communities, the potential for importance to wildlife species of the features tends to be similar to that found in surrounding upland vegetation communities.

Gorman Creek

In the project area, Gorman Creek follows its natural and historic course until it reaches the southern portion of the project area along I-5, where it once again becomes channelized (concrete-lined) for another three miles to the south where it enters a natural stream channel. From that point, Gorman Creek flows another two miles south into Pyramid Lake. Gorman Creek becomes a third-order stream (Strahler Stream Order) approximately one mile north of the SR-138 project area, where it is joined by two larger second-order streams. However, due to the lack of seasonal moisture and overall dry characteristics, Gorman Creek is mapped as an ephemeral stream within the project area.

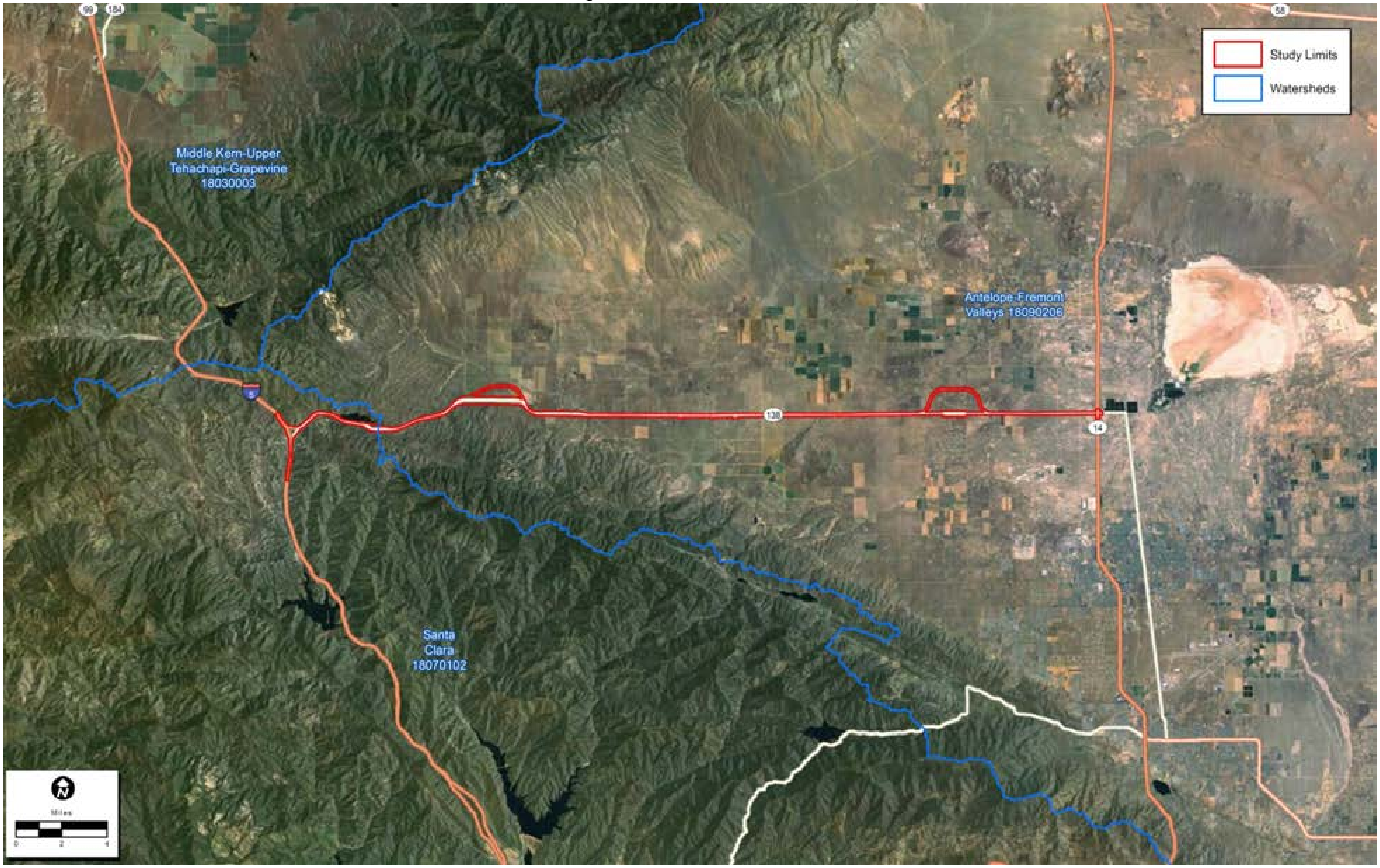
In the project area, Gorman Creek flows along the east side of I-5 and contains natural vegetation within a natural stream course. There are three culverts where the creek crosses under two sets of SR-138 on- and off- ramps to I-5 and where it crosses under Quail Lake Road. Box culverts at these locations are 40 to 50 feet in width with multiple 4-foot wide channels. The entire creek was dry at the time of the survey. Vegetation along the stream course within the project area consists of thick willow cover with a sparse overhanging canopy of Fremont cottonwoods. There are also mule fat individuals in patches along the stream, as well as a few other riparian herbaceous species, such as curly dock and western ragweed. During the survey, the vegetation community showed signs of drought stress, with a high amount of dead plant material.

Quail Lake Spillway/West Branch of California Aqueduct

Quail Lake is a natural lake that was expanded to provide recreational opportunities and to provide a regional storage facility for waters of the West Branch of the California Aqueduct. The water flowing out of Quail Lake enters into a wide, concrete-lined spillway that flows across SR-138 and south towards I-5. The aqueduct enters into an underground pipeline approximately 0.5 mile east of I-5, where it ultimately flows into Pyramid Lake and Castaic Lake. A smaller side channel of the aqueduct is engineered to release a portion of aqueduct flows into the natural stream channel of Castaic Creek before it crosses under I-5.

Portions of the aqueduct within the project area are concrete-lined, approximately 220 feet in width and 30 feet in depth. They do not support either upland or riparian vegetation. As a conveyance that is part of the California State Water Project, the aqueduct is entirely manmade with neither a headwaters nor a natural flow path. Water flows are entirely dependent on human intervention, and they terminate within manmade reservoirs or other artificial features. Therefore, the aqueduct is not considered a natural feature and is non-jurisdictional to either state or federal entities.

Figure 36: Watershed Area Map



Source: ECORP Consulting, Inc., 2014

Water Quality Standards and Beneficial Uses

Surface water and groundwater water quality objectives for all inland waters in the Lahontan and Los Angeles regions, as documented in the Basin Plans, are listed in the WQAR (GPA Consulting, 2015). In addition to the regional objectives for inland surface waters, the following narrative objectives apply for the protection of wetlands in the Los Angeles region:

Hydrology

Natural hydrologic conditions necessary to support the physical, chemical, and biological characteristics present in wetlands shall be protected to prevent significant adverse effects on:

- Natural temperature, pH, dissolved oxygen, and other natural physical/chemical conditions,
- Movement of aquatic fauna, and
- Survival and reproduction of aquatic flora and fauna, and water levels.

Habitat

Existing habitats and associated populations of wetlands fauna and flora shall be maintained by:

- Maintaining substrate characteristics necessary to support flora and fauna which would be present naturally,
- Protecting food supplies for fish and wildlife,
- Protecting reproductive and nursery areas, and
- Protecting wildlife corridors.

The Lahontan RWQCB Basin Plan lists the following beneficial uses for the receiving water bodies in the project area:

- Amargosa Creek: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Ground Water Recharge (GWR), Water Contact Recreation (REC1), Non-contact Water Recreation (REC2), Commercial and Sport Fishing (COMM), Warm Fresh Water Habitat (Warm), Cold Fresh Water Habitat (COLD), and Wildlife Habitat (WILD).
- Rosamond Dry Lake Creek: (GWR), (REC2), (WARM), Inland Saline Water Habitat (SAL), and (WILD).

The Los Angeles RWQCB Basin Plan lists the following beneficial uses for the receiving water bodies in the project area:

- Pyramid Lake (as identified on the Basin Plan of Los Angeles RWQCB): MUN, Industrial Service Supply (IND), Industrial Process Supply (PRO), AGR, GWR, Hydropower Generation (POW), Warm, COLD, WILD, and Rare, Threatened, or Endangered Species (RARE).
- Castaic Lake: MUN, IND, Industrial Process Supply (PROC), AGR, GWR, Freshwater Replenishment (FRSH), Navigation (NAV), WARM, COLD, WILD, RARE, and Fish Spawning (SPWN).

- Gorman Creek: MUN, AGR, GWR, WARM, COLD, WILD, and Fish Migration (MIGR).
- Santa Clara River: MUN, IND, PROC, AGR, GWR, FRSH, WARM, COLD, WILD, Areas of Special Biological Significance (BIO), RARE, MIGR, SPWN, and Wetlands (WET).

Environmental Consequences

Short-Term Construction Impacts

No-Build Alternative

The No-Build Alternative would not require any construction activities; therefore, no short-term construction impacts on water quality would result from this alternative.

Alternative 1 (Freeway/Expressway), Alternative 1 (Antelope Acres Bypass), and Alternative 2 (Expressway- Conventional Highway)

During construction, there is the potential for increased turbidity in waterways near the project area as a result of disturbed soils, and there is potential for chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste to be spilled or leaked and have the potential to be transported in storm water runoff into receiving waters. However, potential impacts would be temporary and would not result in a permanent change in water quality within these waterways. In addition, with implementation of BMPs, substantial soil erosion or the release of pollutants within waterways is not anticipated. The project would not result in impacts on water temperature or cause oxygen depletion within waterways during construction. Therefore, no substantial or adverse changes in the physical/chemical characteristics of the aquatic environment are expected to result from the project.

The project would not result in the loss of aquatic habitat, and would not result in changes to waterways that would be expected to affect fish or local wildlife passage in the project area. No substantial or adverse changes in the biological characteristics of the aquatic environment are expected to result from the project.

The project would also require the disturbance of 2,347 acres under Alternative 1, 2,307 acres under the Alternative 1 (Antelope Acres Bypass), and 1,889 acres under Alternative 2. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. In addition, during a storm event, soil erosion could result at an accelerated rate.

The alternatives would be required to comply with the Construction General Permit (CGP). Under the CGP, the project is required to perform a risk assessment to determine the project risk level. The project risk level is determined from the sediment risk and the receiving water risk. The receiving water risk is classified as high because a portion of the disturbed area discharges indirectly to Pyramid Lake, which is a 303(d)-listed waterbody impaired by sediment. The project is classified as Risk Level 2 because of the combined medium sediment risk level and the high receiving water risk. All risk levels are subject to temporary construction site BMP implementation and visual monitoring requirements. Risk Level 2 projects require storm water sampling at all discharge locations, with the samples subject to Numeric Action Levels for pH and turbidity. The required BMP implementation and sampling would minimize impacts to receiving water bodies.

In accordance with the CGP, a SWPPP would also be required prior to construction because the Disturbed Soil Area (DSA) would be more than one acre for Alternative 1, Alternative 1 (Antelope Acres

Bypass), and Alternative 2. The SWPPP would include the development of a Construction Site Monitoring Program that would present procedures and methods related to the visual monitoring and sampling and analysis plans for non-visible pollutants, sediment, turbidity, pH, and receiving waters.

The project would include the protection of existing vegetation for erosion and sediment control. Existing vegetation in the project area primarily consists of species adapted to the arid desert environment. Between approximately 220th Street West and 170th Street West, large groves of Joshua Trees are located on both sides of the existing SR-138. Existing vegetation to remain in place would be protected in temporary Environmentally Sensitive Areas (ESA) that would be fenced during construction. It is not expected that ground water would be encountered during construction, and ground water dewatering would not be required for the project.

Because the construction BMPs would be designed to retain sediment and other pollutants in the project area so they would not reach receiving waters, storm water discharges and authorized non-storm water discharges are not anticipated to cause or contribute to any violations of applicable water quality standards or objectives, or adversely impact human health or the environment. Therefore, water quality impacts during construction of the build alternatives would not be adverse.

Long-Term Operational Impacts

No-Build Alternative

The No-Build Alternative would not result in any operational improvements in the project area; therefore, no long-term operational impacts on water quality would result from this alternative.

Alternative 1 (Freeway/Expressway), Alternative 1 (Antelope Acres Bypass) and Alternative 2 (Expressway-Conventional Highway)

The added impervious surface area for each of the alternatives is shown below.

Table 68: Added Impervious Surface Area

Area (acres)	Build Alternative 1	Build Alternative 1-Antelope Acres Bypass	Build Alternative 2
New Impervious Area	451	451	439
Existing Impervious Area to be Removed	37	26	37
Net Added Impervious Area	414	425	402

Source: Metro and Caltrans District 7, 2015

The existing impervious areas to be removed include existing pavement that would need to be removed to make way for the proposed improvements, as well as portions of SR-138 that would be relinquished to the County. The additional impervious areas proposed under Alternatives 1, Alternative 1 (Antelope Acres Bypass, and Alternative 2 may increase the volume and velocity of the storm water discharge, which could carry additional pollutants into receiving waterways. Pollutants of concern during operation of the build alternatives include suspended solids/sediments, nutrients, pesticides, heavy metals, oil and grease, toxic organic compounds, and trash and debris.

To minimize potential impacts, the project would incorporate Low Impact Design (LID) efforts to maintain or restore pre-project hydrology, as well as provide overall water quality improvement of discharges. Potential LID measures that are being considered for the project to improve water quality include:

- Grade slopes to blend with the natural terrain and decreasing the need for dikes;
- Design permanent drainage facilities that mimic the existing pattern of the area through the use of permanent check dams for attenuation of flow and disconnected drainage facilities;
- Construct ditches with permanent check dams to decrease the velocity of discharge, plus decrease the volume of discharge by promoting infiltration and allowing for pollutant removal; and
- Maintain existing vegetated areas.

The effectiveness of these LID efforts and the pre- and post- project hydrology would be compared during the PS&E phase.

As the project involves more than one acre of added impervious surface area for all the project alternatives, treatment BMPs would need to be considered for areas within Caltrans' ROW. Infiltration devices are considered the preferred treatment BMP for its ability to treat Pollutants of Concern from typical highway runoff and recharge groundwater. Infiltration devices in the form of linear infiltration trenches are considered generally feasible for the project for the following reasons:

- The majority of project area is classified into Hydrologic Soil Groups (HSGs) A or B, estimated to have an infiltration rate greater than 0.5 inches per hour, based on published data from the Natural Resources Conservation Service (NRCS) Web Soil Survey. In-situ permeability tests would be conducted during the PS&E phase for each potential BMP site, including biofiltration swales and strips and infiltration trenches, to obtain a site-specific infiltration rate for BMP design and sizing.

- The groundwater table is generally on the order of about 140 feet below ground level along the alignment, thus allowing significant filtration through soil before runoff reaches the groundwater.

- The extremely flat terrain on the eastern portion of the corridor (on average 0.5% grade), between approximately 1,000 feet east of 140th Street West and SR-14, facilitate maximum filtration.

- Recharging of the groundwater basin would help alleviate the drought condition.

For areas outside of Caltrans' ROW, treatment BMPs would follow the 2014 Los Angeles County Public Works Low Impact Development Standards Manual. Since the project involves more than one acre of disturbed area and proposes to add more than 10,000 square feet of impervious surface area, it is required to meet storm water management requirements for "Designated Projects," which "must retain 100 percent of the Stormwater Quality Design Volume on-site through infiltration, evapotranspiration, storm water runoff harvest and use, or a combination thereof unless it is demonstrated that it is technically infeasible to do so."

Any work involving the construction, installation, modification, or removal of underground storage tanks (Los Angeles County Code [LACC] Title 11, Division 4), industrial waste treatment or disposal facilities, and/or storm water treatment facilities, will be conducted in coordination with the Los Angeles County Public Works, Environmental Programs Division, who will be contacted for required approvals and operating permits. Specific industry types will also be subject to registration and inspections related to implementation of BMPs to prevent stormwater-related pollution (LACC Title 12, Chapter 12.80).

There are wetlands and Waters of the U.S. and State in the project area, which are protected under federal (CWA Section 404), and state (CWA Section 401 and California Fish and Game Code Section 1602), regulations as well as the also protected under the Porter-Cologne Act. A pre-construction notification under CWA Section 404 Nationwide Permit 14 from the USACE, a CWA Section 401 Water Quality Certification from the RWQCB, and a California Fish and Game Code Section 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife (CDFW) would be required for the project.

The project would not result in the loss of aquatic habitat, and would not result in changes to waterways that would be expected to affect fish or local wildlife passage in the project area. No substantial or adverse changes in the physical, chemical, or biological characteristics of the aquatic environment are expected to result from project operation. In addition, because the project would include BMPs to reduce pollutants of concern in runoff from the project area, and the proposed storm drain system would be sized to accommodate the build-out of the project, water quality impacts during operation of Alternatives 1, Alternative 1 (Antelope Acres Bypass), or Alternative 2 would not be adverse.

Cumulative Impacts

The cumulative setting is considered the Antelope-Fremont Valley and Santa Clara Watersheds. Existing and continuing development, as well as flood control measures and structures, contribute to cumulative water quality impacts.

No-Build Alternative

The No-Build Alternative would not result in any temporary or long-term impacts related to water quality; therefore, no cumulative impacts would result from this alternative.

Alternative 1 (Freeway/Expressway) Alternative 1 (Antelope Acres Bypass) and Alternative 2 (Expressway-Conventional Highway)

The cumulative setting is considered the Antelope-Fremont Valley and Santa Clara Watersheds. Existing and continuing development, as well as flood control measures and structures, contribute to cumulative water quality impacts. There are 36 transportation, energy, and residential/commercial development projects in the Cities of Lancaster and Palmdale, and unincorporated portions of Kern and Los Angeles Counties that are being planned, are under construction, or have been completed in the cumulative impact study area.

The project would require the disturbance of 2,347 acres under Alternative 1; 2,307 acres under Alternative 1 (Antelope Acres Bypass) and 1,889 acres under Alternative 2. During construction, the project would have the potential to result in increased construction-related pollutants and turbidity within the lakes, creeks, and drainages in the project area, and eventually into receiving water bodies. In addition, the project would result in a net added impervious surface area of 414 acres under Build Alternative 1; 425 acres under Alternative 1 (Antelope Acres Bypass) and 402 acres under Build Alternative 2.

The project would have the potential to contribute to cumulative water quality impacts in the Antelope-Fremont Valley and Santa Clara Watersheds. With the implementation of standard BMPs, compliance with regulatory permits, and implementation of avoidance and minimization measures listed below, project impacts would be reduced to the extent feasible. Future projects in the cumulative impact area would be expected to implement similar measures. Because the project includes BMPs to reduce pollutants of concern in runoff from the study area, and the proposed storm drain system is sized to accommodate the build-out of the project, the build alternatives' contributions to cumulative water quality impacts are anticipated to be less than cumulatively considerable.

Avoidance, Minimization, and/or Mitigation Measures

Standard BMPs would be incorporated into the project to comply with the Caltrans and County's NPDES Permits, and would include the following:

- Storm Water Treatment Best Management Practices (BMPs) would be incorporated into the project to mitigate the impacts to water quality because of the proposed increase in impervious areas within the project limits. Given the high to moderate infiltration rates anticipated in native soils and the flat terrain, infiltration trench appears to be an ideal treatment BMP option for the project. A "Long Form" Storm Water Data Report (SWDR) would be utilized to summarize the storm water quality issues as a result of the proposed improvements. A project SWDR would be prepared separately.

- Storm Water Treatment Best Management Practices (BMP) would be incorporated along the I-5 corridor within the project footprint to minimize the impacts to water quality due to the proposed increase in impervious areas within the project limits. BMPs identified by the I-5 *Corridor Stormwater Management Study* dated February 2012 would be evaluated and implemented based on feasibility and need.

In addition to standard BMPs, the following avoidance and minimization measures would be implemented during construction to avoid or minimize adverse effects on water quality during construction:

WQ-1 The Temporary Construction Site BMP strategy for the project would consist of the following: Soil Stabilization Measures, Sediment Control Measures, Tracking Control, Non-Storm Water Management Measures, General Construction Site Management, and Storm Water Sampling and Analysis.

WQ-2 The minimum erosion control measures considered for this project would include:

- Move-in/Move-out (Erosion Control)
- Fiber rolls
- Rolled Erosion Control Product (Netting)

The move-in/move-out (erosion control) would be required due to the size and the three-year duration of the project construction and would be utilized to ensure permanent erosion control stabilization is in place. The fiber rolls would be placed on disturbed soils to remain unpaved or unlined. The rolled erosion control product (netting) would be placed in all drainage ditches and slopes greater than 4(H):1(V). Hard surfaces for the project drainage are anticipated to consist of rock slope protection and the end of pipe and culvert outlets.

WQ-3 All work in waterways would be scheduled per regulatory requirements and would be detailed in the project's special provisions during the PS&E phase. Maintenance pullouts would be considered for the project, and side slopes would be specified as flat as possible to minimize erosion and for ease of maintenance. Concentrated flows would be collected into stabilized earth ditches or lined ditches.

WQ-4 No work would take place in flowing water, and all work areas in waterways would be reduced to the maximum extent feasible to minimize impacts.

WQ-5 Construction staging areas would be in upland areas outside waterways to reduce direct and indirect impacts on lakes, creeks, and drainages in the project area. Construction equipment would use existing roadways to the extent feasible.

WQ-6 ESA fencing would be installed around water resources, where feasible, to prevent unauthorized vehicles or equipment from entering or otherwise disturbing surface waters.

WQ-7 The contractor would implement appropriate hazardous material BMPs to reduce the potential for chemical spills or containment releases into water bodies, including any non-storm water discharge.

WQ-8 All equipment refueling and maintenance would be conducted in the upland staging area per standard specifications and regulatory permits. In addition, vehicles and equipment would be checked daily for fluid and fuel leaks, and drip pans would be placed under all equipment that is parked and not in operation.

WQ-9 All trash and construction debris would be removed from channels and construction areas on a daily basis. All BMPs would be properly maintained during project construction and removed upon completion of construction activities. After completion of the project, all construction equipment and materials would be removed from the project area, and the project area would be returned to pre-project conditions.

WQ-10 Storm water from the project would discharge to Department of Water Resources (DWR)'s jurisdiction. Work within DWR's ROW at the California Aqueduct crossings would need to be conducted during winter months when the demand for water supply is relatively low. The proposed drainage and storm water treatment design would be reviewed by DWR during the design phase of the project.

WQ-11 The following measures from the *Preliminary Geotechnical Design Report* prepared for the project would be implemented to minimize surficial instability and erosion for cut slopes with a gradient of 2H:1V:

- The upper four feet of slope face would be covered with materials with a minimum internal friction angle of 30 degrees and a minimum cohesion of 180 psf. This Select Material should be properly keyed and benched into the sloping ground, and this would require overcutting the slope and re-building the slope with the above Select Material.

- The slope face would be covered with special man-made erosion control mats or geo-fabric.

- The slope face would be planted with low-maintenance ground cover that is adaptable to the desert-like arid conditions. A landscape architect specializing in arid environment should be consulted to select the proper ground cover.

- Slope benching would be used to flatten the overall gradient of the cut slope; the bench would also reduce the velocity of water flowing past the slope face. However, benching alone would not eliminate erosion of the slope face; treatment of the slope face using Select Material, slope planting or special matting is still required.

WQ-12 Following completion of construction activities, appropriate erosion control measures would be implemented to ensure that soils disturbed by construction are stabilized, to minimize non-storm water discharges into water bodies in the project area, and to meet the requirements of the Los Angeles and Lahontan RWQCB and project permits.

WQ-13 Vegetation removed from the project area would be treated and disposed in a manner that would prevent the spread of invasive species on- or off-site. If erosion control seed mixes are used, they would be composed of non-invasive species, and all erosion control would be conducted in a manner that would not result in the spread of invasive species.

WQ-14 BMPs, such as silt fencing, fiber rolls, straw bales, or other measures, would be implemented during construction to minimize the potential for dust, debris, and construction materials to fall into waterways, or otherwise leave the construction area.

WQ-15 A Storm Water Management Plan (SWMP) would be prepared to reduce or eliminate pollutants in runoff discharging to drainage conveyances and waterways. The SWMP is the framework for developing and implementing guidance to meet permit requirements for storm water discharges.

Storm water quality mitigation is accomplished by complying with the Statewide Permit and the Storm Water Management Plan (SWMP). Avoidance and minimization measures for storm water are accomplished through implementation of approved BMPs, which are generally broken down into four categories; Pollution Prevention, Treatment, Construction, and Maintenance BMPs. The Storm Water Program contains guidance for implementation of each of these BMPs. Certain projects may require installation and maintenance of permanent controls to treat storm water. Selection and design of permanent project BMPs is refined as the project progresses through the planning stage and into final design.

WQ-16 Vegetation clearing would be minimized to the extent feasible. Where possible, existing vegetation would be mowed to allow vegetation to reestablish and prevent potential storm water impacts.

WQ-17 Following construction, all temporarily disturbed areas would be restored to pre-project conditions.

WQ-18 Measures to mitigate for unavoidable impacts (both permanent and temporary) on jurisdictional features will be coordinated with USACE, RWQCB, and CDFW during the permitting process with consideration of on-site restoration, off-site mitigation, and in-lieu fees. In general, the ratios are based on the amount and quality of the impacted jurisdictional features of the agencies. In determining appropriate mitigation ratios for impacts to waters of the State, RWQCB staff considers Basin Plan requirements (minimum 1.5:1 mitigation ratio for impacts to wetlands) and utilizes 12501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios, published December 2012 by the USACE, South Pacific Division.

WQ-19 A qualified water quality monitor with experience and training in natural resources, geology, soils, hydrology, ecology, or related discipline would be on site every day during project construction. The water quality monitor would have experience in storm water management, erosion prevention, and erosion control as evidenced by work experience or certifications such as Qualified Stormwater Practitioner, or Qualified Stormwater Designer.

WQ-20 A clear communication plan between project staff, Caltrans, the County, environmental compliance monitors, and regulatory agencies would be developed and regularly updated to allow for efficient communication between all project personnel.

3.2.3 GEOLOGY/ SOILS/ SEISMIC/ TOPOGRAPHY

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department’s Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. Structures are designed using the Department’s Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge’s category and classification would determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department’s Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria

Affected Environment

The geology/soils/seismic/topography impact analysis is based on the results from the *Preliminary Geotechnical Design Report* (DGDR) for SR-138 Corridor Improvement Project completed on July 7, 2015. This section summarizes the analysis of the existing geological conditions in the project area and an analysis of project alternatives, which include Build Alternatives 1 and 2 and the No Build Alternative.

Geologic Setting/Physiography

The project, located in the Antelope Valley, is within the western part of the geologic region of California known as the Mojave Desert Geomorphic Province with the westernmost portion of the project alignment in the foothills of the Transverse Ranges. The Mojave Desert province is bound to the northwest by the Garlock Fault and the Tehachapi Mountains and to the southwest by the San Andreas Fault zone, which includes the San Gabriel Mountains. The Mojave Desert is characterized by interior enclosed drainage and several playas (dry lake beds). The valley floor contains several erosion resistant bedrock hills such as the Fairmont, Antelope, and Little Buttes. The general elevation of the valley generally decreases to the east at a gradient of less than 0.5%.

Topography and Drainage

The project is located in the Antelope Valley, in northwestern Los Angeles County. The Antelope Valley is generally characterized by flat, sandy terrain with widely scattered hills and isolated peaks and includes erosion resistant bedrock formations. The valley is bound on the south by the southeast trending San Andreas Fault zone and the Transverse Ranges. The western end of the project crosses the San Andreas Fault zone and is located in the foothills of the Transverse Ranges. The project area ranges in altitude from 2,320 feet at its lowest point at the interchange of the SR-138 and SR-14 to 3,410 feet, the highest point at the eastern end of the Quail Lake Sky Park Airport. Relief over the majority of the alignment is minimal with a gradual elevation loss towards the east. The total elevation difference along the 36 miles of the proposed improvements is approximately 1,090 feet.

The proposed improvements cross the California Aqueduct near the west end of Quail Lake, and near 245th Street West. The aqueduct is contained in an open, concrete-lined channel, at both locations

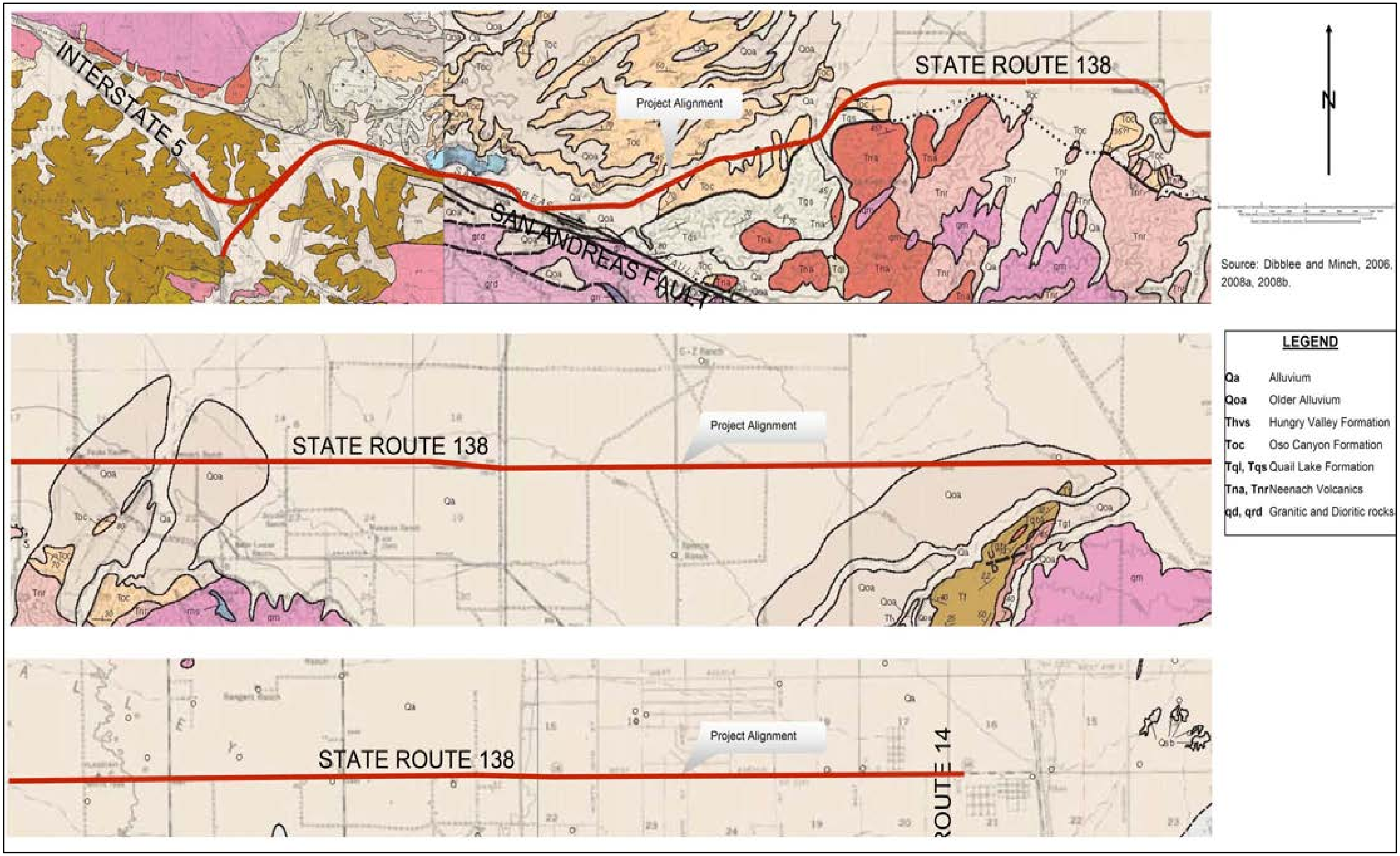
The Antelope Valley is a closed basin with no outlet to the ocean. Along the alignment of the proposed improvements the valley drains generally to the northeast and east. There are no major streams present in the area of the project. However, there are numerous unnamed drainages that descend from the mountains along the southerly margin of the valley and pass under SR-138. The majority of these drainages do not experience flow except during heavy rainfall and are not confined to manmade channels. Scour potential exists at these locations during flash flood conditions.

Regional Geology and Seismicity

Geologic Structure

The Antelope Valley is part of a wedge-shaped structural basin that has been down-dropped between the Garlock fault to the northwest and the San Andreas Fault to the southwest (see Figure 37). The basin is underlain at depth by pre-Tertiary age igneous and metamorphic rocks overlain by Tertiary-age sedimentary rocks. These rocks protrude out in the surrounding mountains and foothills. The basin is infilled by Pliocene- to Holocene-age alluvial and lacustrine deposits. These types of sediments can reach depths of several thousand feet. Under the project area it is estimated that they are a maximum of several hundred feet thick.

Figure 37 Regional Geologic Map



Source: Geotechnical Report, 2015, KHA

The project area includes the San Andreas Fault, which is a major active fault that is capable of generating a 7.9 magnitude earthquake. The San Andreas Fault trends northwest-southeast for approximately 700 miles from the Gulf of California to the Cape Mendocino area of northern California. The project area also includes the Neenach and Randsburg-Mojave Faults. These faults bisect the Antelope Valley forming groundwater barriers between the West Antelope, Neenach, and Lancaster hydrologic sub-basins. These faults are inferred by groundwater data and are not considered active.

Geologic Hazards
The alluvial fan sediments that infill the basin is known to be occasionally vulnerable to settlement when wet; this is commonly referred to as hydroconsolidation or soil collapse. The sediments that are underlying the majority of the project area are considered to have potential for hydroconsolidation. Under current groundwater and surface hydrologic conditions, the potential for hydroconsolidation is unlikely. However, if a particular area experiences increased water infiltration as a result of irrigation, sustained, and heavy rainfall that results in ponding or water retention, or if groundwater level substantially increases, then settlement that results from hydroconsolidation is possible. The settlement magnitude because of hydroconsolidation, if any, should be evaluated during design of the proposed improvements based on local hydrological and soil boring samples.

Because of the relatively flat terrain in the project area, there is little potential for slope instabilities such as landslides or rock falls. The existing cut slopes along the route are generally in good condition with minimal erosion and no major slope failures were observed.

While the project area is underlain by sandy soils, the potential for liquefaction in the area is most likely low because the groundwater depth is too deep for the subsurface materials to be susceptible to liquefaction during a large earthquake.

The project area is located many miles from the Pacific Ocean and is within a closed basin with no outlet to the ocean. Therefore, the potential for tsunami inundation in the area is considered nil.

Quail Lake is located adjacent to the alignment on the western end of the route. In the occasion of a seismic event, Quail Lake is subject to seiche. A seiche is a standing wave that is generated by an earthquake within an enclosed body of water (lake, reservoir, swimming pool, etc.). During an earthquake, a seiche may cause flooding of the immediate area. Because of the proximity of the lake to the San Andreas Fault, the possibility of flooding as a result of a seiche should be considered during design of the adjacent structures.

Ground Rupture
Seismically induced ground rupture is the physical displacement of surficial materials resulting from an earthquake. Areas along traces of active faults are more likely to experience ground rupture. The California Geologic Survey (CGS) as part of the 1972 Alquist-Priolo Special Studies Zone Act, identified areas in fault zones with higher potential for ground rupture.

The Mojave segment of the San Andreas Fault zone crosses the western portion of the proposed alignment of SR-138 near Interstate 5 and Quail Lake. In this area, the San Andreas Fault is zoned within an Alquist-Priolo Zone (Figure 38). The SR-138 is located entirely within the Alquist-Priolo zone from approximately Sta 60+00 of the existing alignment to Sta 1130+00 of the proposed alignment. The Special Studies Zone (CGS, 1974) is characterized by a zone of sub-parallel faults striking approximately

N75W and is approximately 4,000 feet wide where it crosses SR-138. Numerous fault traces have been identified within this area and the likelihood of surface rupture during an earthquake is considered high. Mapped traces of the San Andreas Fault shown on the Alquist-Priolo map cross the alignment near the location of the proposed Gorman Post Road Overcrossing structure near Quail Lake.

A Caltrans fault rupture hazard analysis (2104a) indicates that the median maximum ground surface displacement associated with a magnitude 7.8 event on the Mojave Segment of the San Andreas Fault can be expected to be approximately 30 feet and the average lateral displacement to be 16.5 feet. The anticipated vertical displacement is likely to be 10% of the lateral displacements although locally greater displacements can result because of topographic characteristics (Caltrans, 2014b).

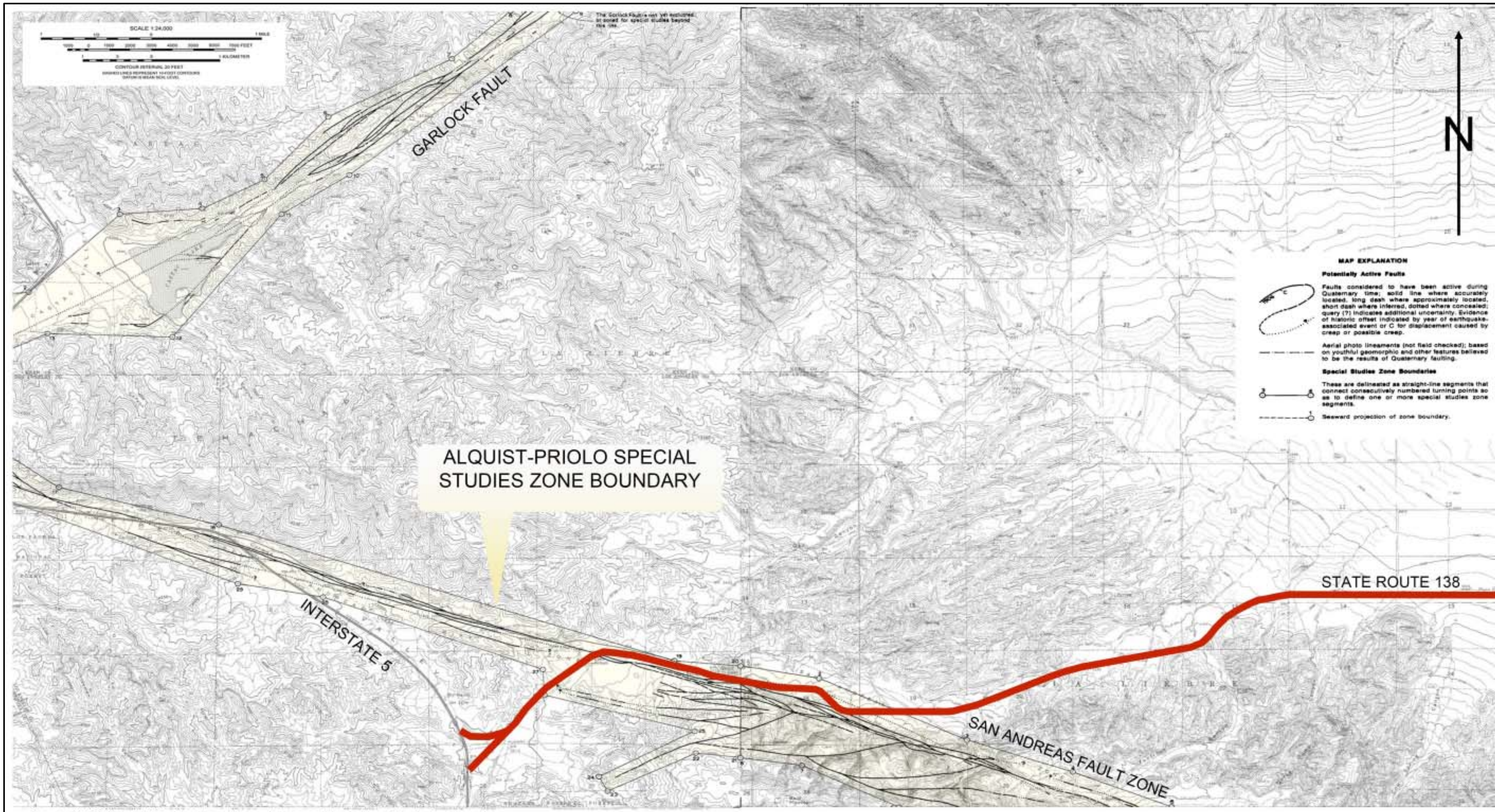
Caltrans performed a fault displacement hazard analysis of the Cholame-Carrizo segment of the San Andreas Fault for the I-5 over the Tejon Pass Overcrossing Bridge in Gorman, California (Caltrans, 2014b). The Tejon Pass Overcrossing Bridge is located approximately 6.1 miles northwest of the proposed Gorman Post Road Overcrossing structure. While the Tejon site is geographically near the project, it is situated on a different segment of the fault with different features (Caltrans, 2014b). This fault rupture analysis determined a design value of at least 20.8 feet lateral displacement (based on probabilistic approach using 33 mm/year slip rate and 5% probability of exceedance in 50 years) at the bridge location and a vertical displacement of 10% of the lateral value.

The proposed SR-138 alignment in the Special Studies zone consists of at-grade roadway with associated cut and fill slopes, a proposed over-crossing structure at Gorman Post Road, an Outlet Structure at Quail Lake and several new or extended culverts. According to the project geometric plans, portions of the planned roadway within the Special Studies Zone are proposed to be in cuts up to approximately 14 feet and on fills up to approximately 30 feet of compacted fill material overlying native earth materials. Retaining walls are also proposed to be within the zone. The roadway and structures located within this zone could be subjected to large ground accelerations, lateral displacements and shear loads during a fault rupture. Special seismic design considerations may be needed for roadway and structures in this segment (Caltrans Memo to Designers 20-10, 2013).

Seismicity

The most noteworthy faults relative to the project area are listed in Table 69 accompanied by estimates of their maximum earthquake magnitude and distance between the site and the faults obtained using the Caltrans ARS Online too (2012b).

Figure 38 Alquist Priolo Special Studies Zones Map



Source: CGS Special Studies Zone Maps; Lebec and La Leibre Ranch Quadrangles

Peak ground accelerations (PGAs) were requested at selected (controlling) locations along the proposed SR-138 station line where substantial roadway improvements are proposed. The site coordinates were obtained from Google Earth (2015) and site PGAs were determined from the upper envelope of the deterministic and probabilistic response spectra obtained using the Caltrans ARS Online tool (2012b).

The resulting PGAs are tabulated below. These accelerations can be used as a basis for initial design of walls and geotechnical hazards.

Table 69: Local Seismic Sources and Peak Ground Accelerations

Fault or Fault Zone	Style of Faulting	Maximum Credible Earthquake (MCE) Magnitude (M)	Approximate Distance and Direction from Site (miles)
San Andreas Fault Zone (Mojave Segment)	RLSS	7.9	0.0
Garlock Fault (West Section)	LLSS	7.7	5.8 NW
Peak Ground Accelerations			
Alternative 1 Alignment Station (Location)		**Post Mile**	**Peak Ground Acceleration (g)**
S-5-E-138 Connector Bridge to Cement Rd UC		0.63 to 4.8	0.88
300th Street West		8.7	0.81
Near LA Aqueduct		14	0.76
170th Street West		22	0.66
90th Street West		30	0.55
Route 138/SR-14 Separation		36.85	0.49

Notes:
Style of faulting, magnitude, and approximate distance from site were obtained from Caltrans ARS Outline (2012b).
RLSS = Right Lateral Strike-Slip, LLSS = Left Lateral Strike-Slip

Source: Geotechnical Report, 2015, KHA

Subsurface Soil Conditions

The Antelope Valley is underlain by a thick sequence of unconsolidated and uncemented alluvial and fan deposits with lesser areas of eolian deposits. The alluvial and fan deposits are Quaternary age and typically consist of alluvial gravels, sands and silts. The eolian deposits primarily consist of thin (less than 10 feet) deposits of very fine to medium grained sand with minor silt.

In the western portion of the route, SR-138 enters the foothills of the central Transverse Ranges. These hills are underlain by Tertiary age marine and non-marine sedimentary rocks of the Quail Lake (Tq), Hungry Valley (Thv), Oso Canyon (Toc) and Ridge Route Formations (Trri) (Dibblee and Minch, 2006, 2008a and 2008b). These sedimentary rocks variously consist of sandstones, shales, and claystones. The Quail Lake Formation and the Oso Canyon Formation are also known to contain conglomerate beds.

A site-walk was conducted on September 24, 2014 by geotechnical engineers to observe existing ground conditions as well as embankment fills and cuts along the entire alignment and at bridge sites. Bulk samples were collected at six locations that are representative of the typical soil encountered along the project alignment.

Table 70: Bulk Sample Pertinent Data

Boring	Approximate Station along SR-138 (feet)	Maximum Credible Earthquake (MCE) Magnitude (M)	Approximate Distance and Direction from Site (miles)
B-14-1	2240+00	4	SM
B-14-3	1262+60	4	SP-SM
B-14-4	1016+60	4	SP-SM
B-14-5	72+50 (NB I-5 to EB SR-138 Connector Line)	4	SM
B-14-6	1360+00	4	SC

Source: Geotechnical Report, 2015, KHA

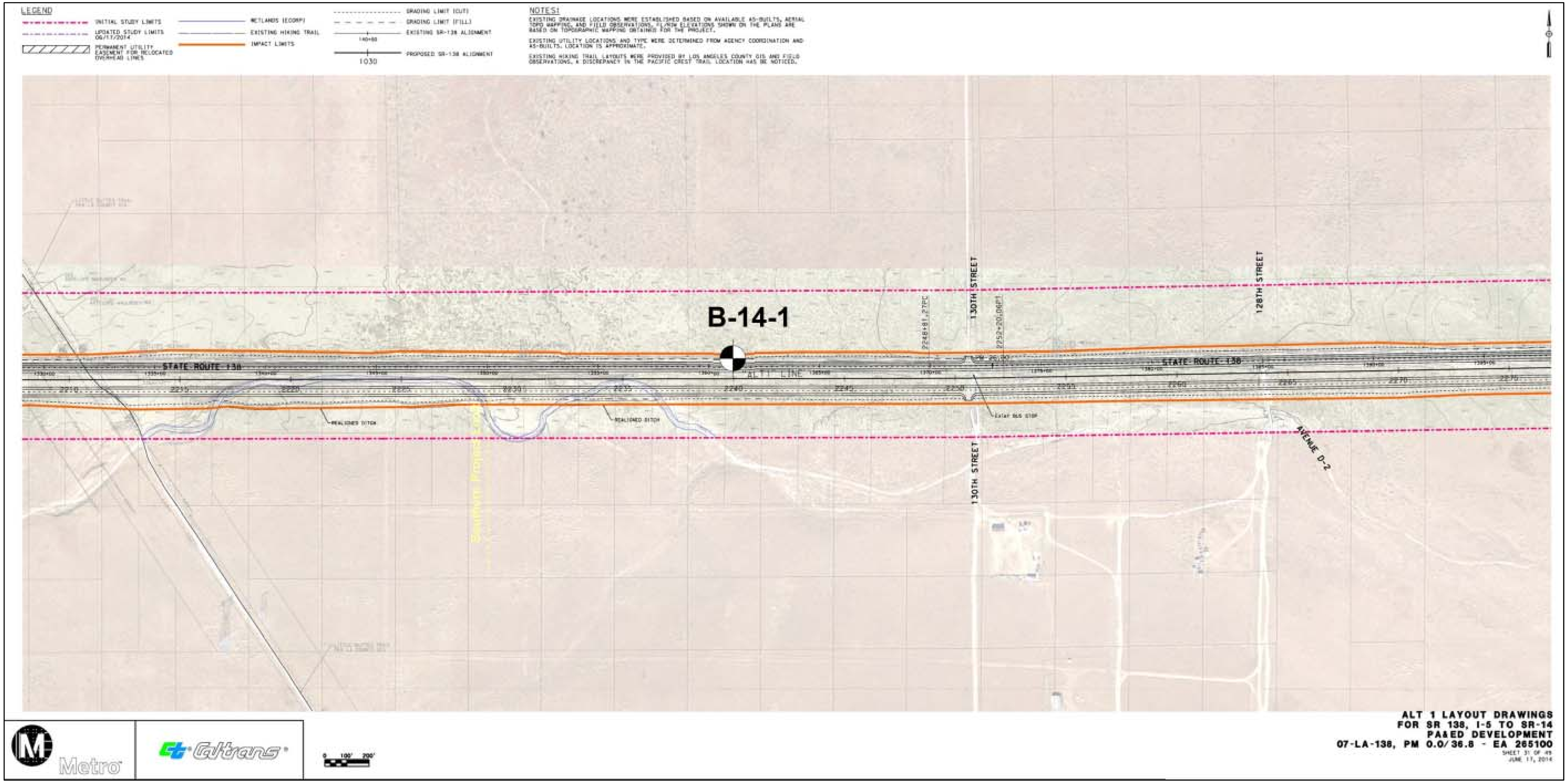
Bulk samples were also tested for soil classification and to obtain or derive relevant physical and engineering properties. In-situ moisture content, grain size analysis and soil corrosivity tests were performed. The laboratory soil tests were conducted in accordance with California Test methods or American Society for Testing and Materials standards.

Based on subsurface information obtained from the as-built Log-of-Test-Borings (LOTB) and bulk samples, the data indicates that the project alignment is underlain primarily by medium dense to very dense sand with gravel and scattered pebbles.

Groundwater

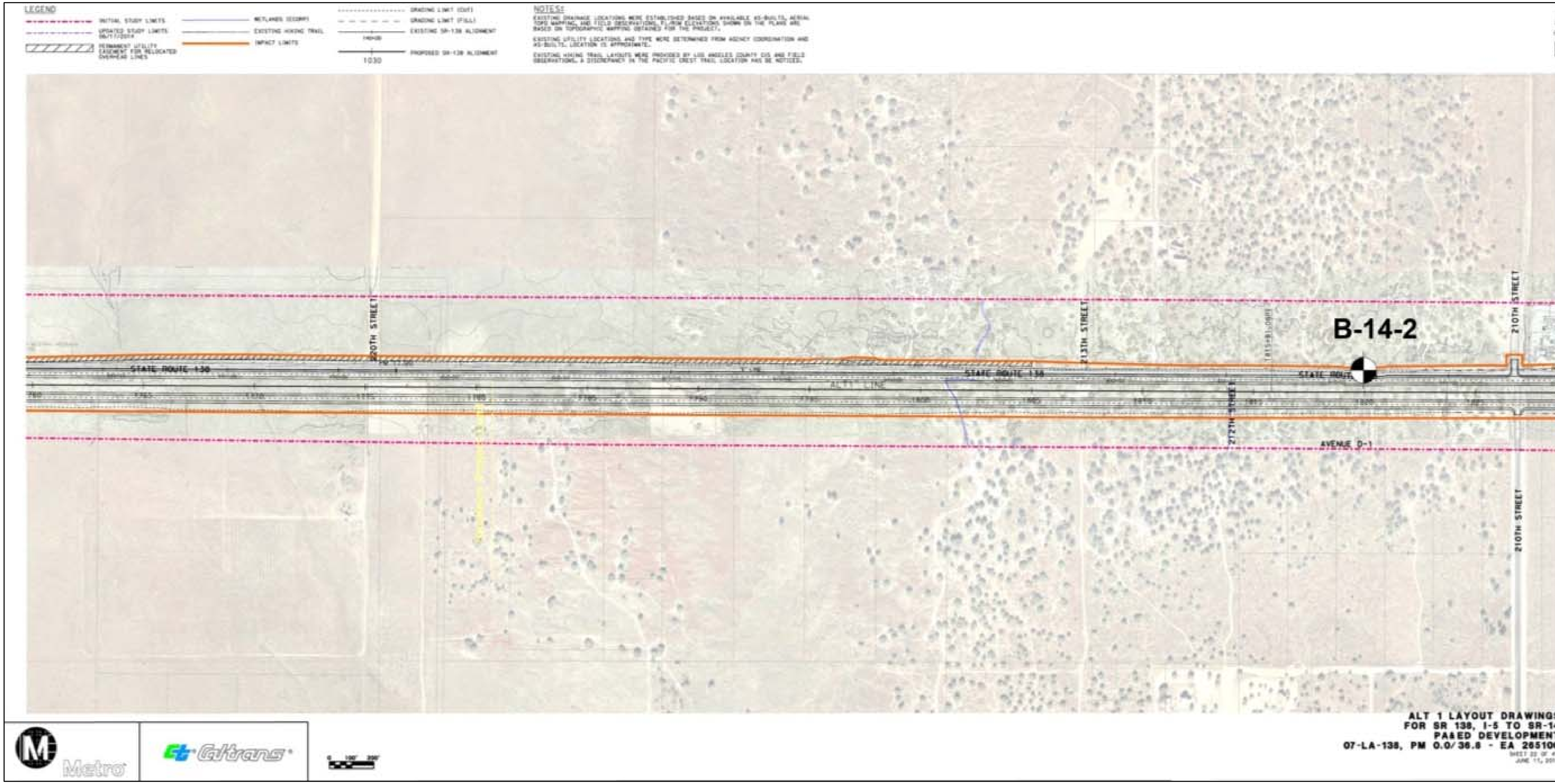
The project is located in the Antelope Valley Groundwater Basin, specifically the West Antelope Neenach and Lancaster sub-basins. Groundwater is generally approximately 140 feet below ground level along the alignment. The groundwater at western end of the alignment may be locally shallower near the San Andreas Fault.

Figure 39 Boring Location Plan (1 of 6)



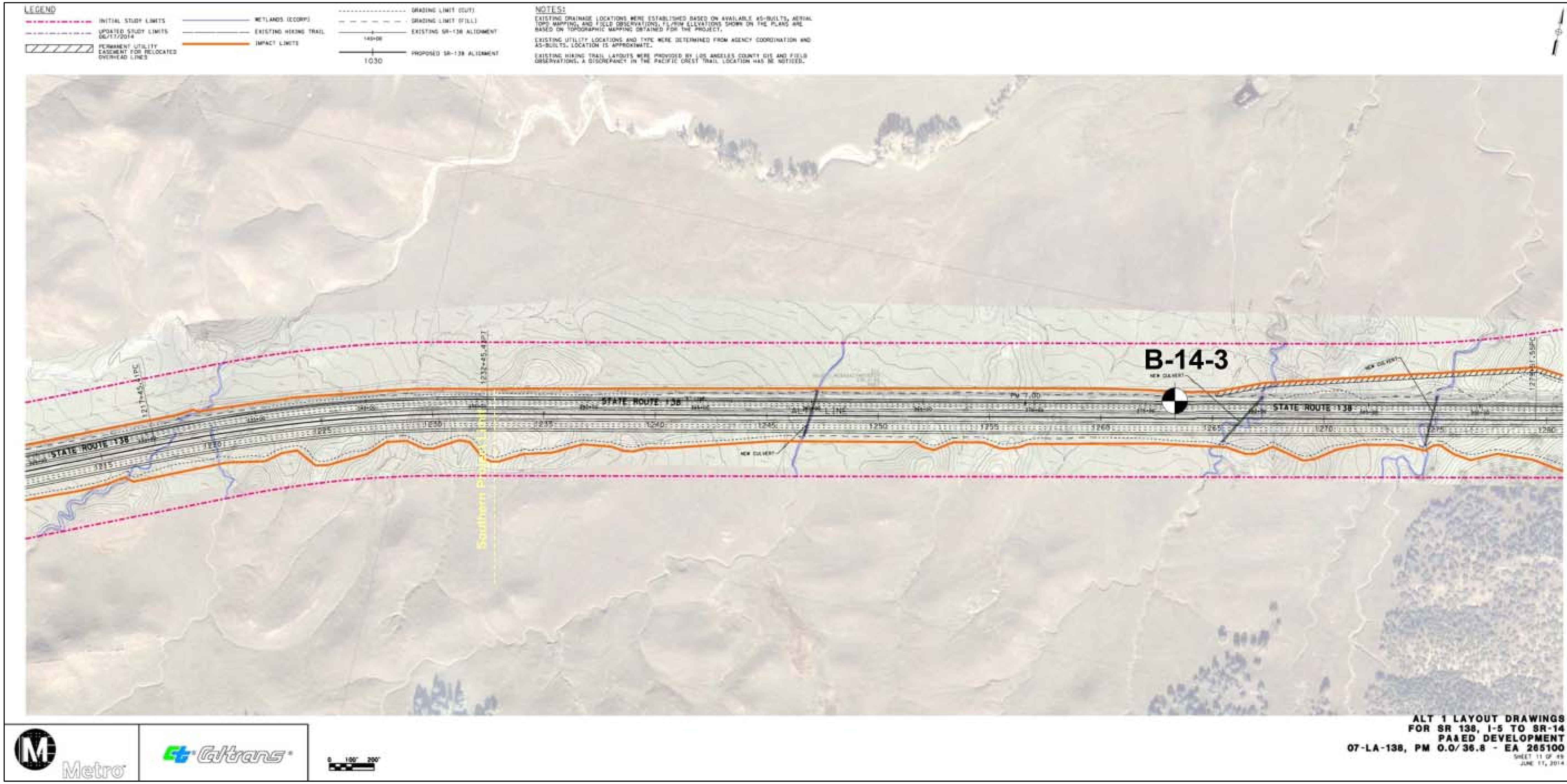
Source: Geotechnical Report, 2015, KHA

Figure 40 Boring Location Plan (2 of 6)



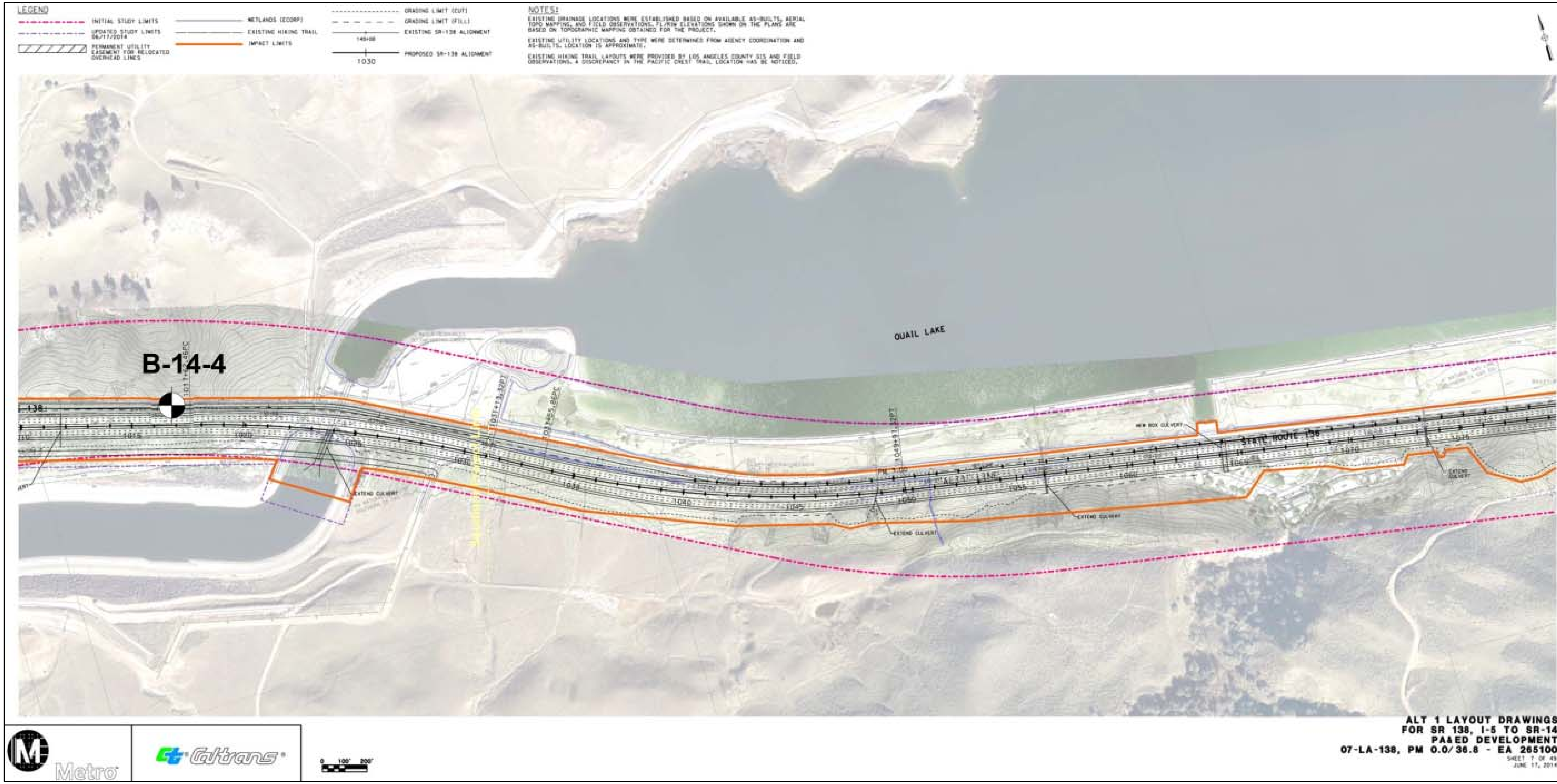
Source: Geotechnical Report, 2015, KHA

Figure 41 Boring Location Plan (3 of 6)



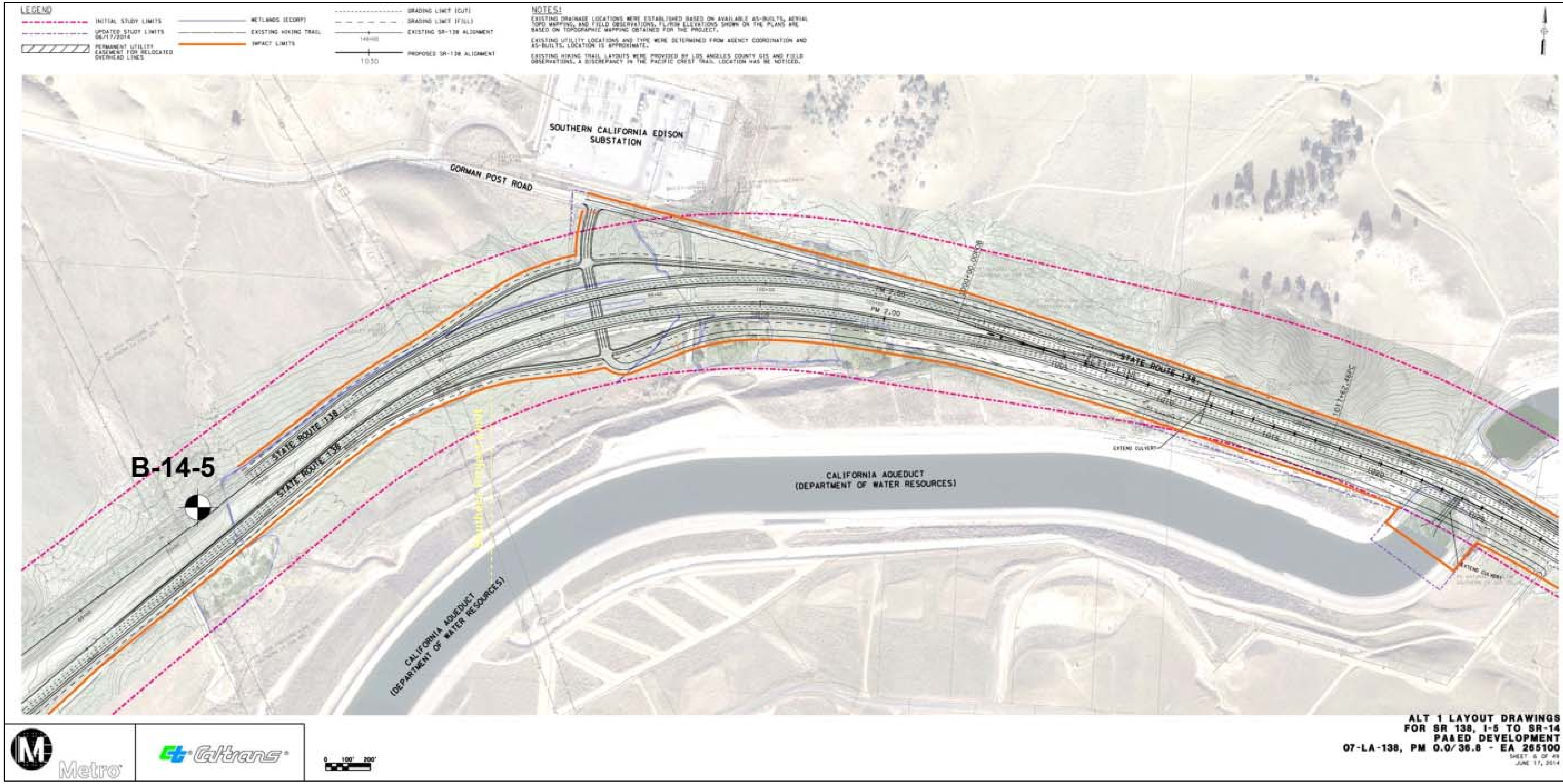
Source: Geotechnical Report, 2015, KHA

Figure 42 Boring Location Plan (4 of 6)



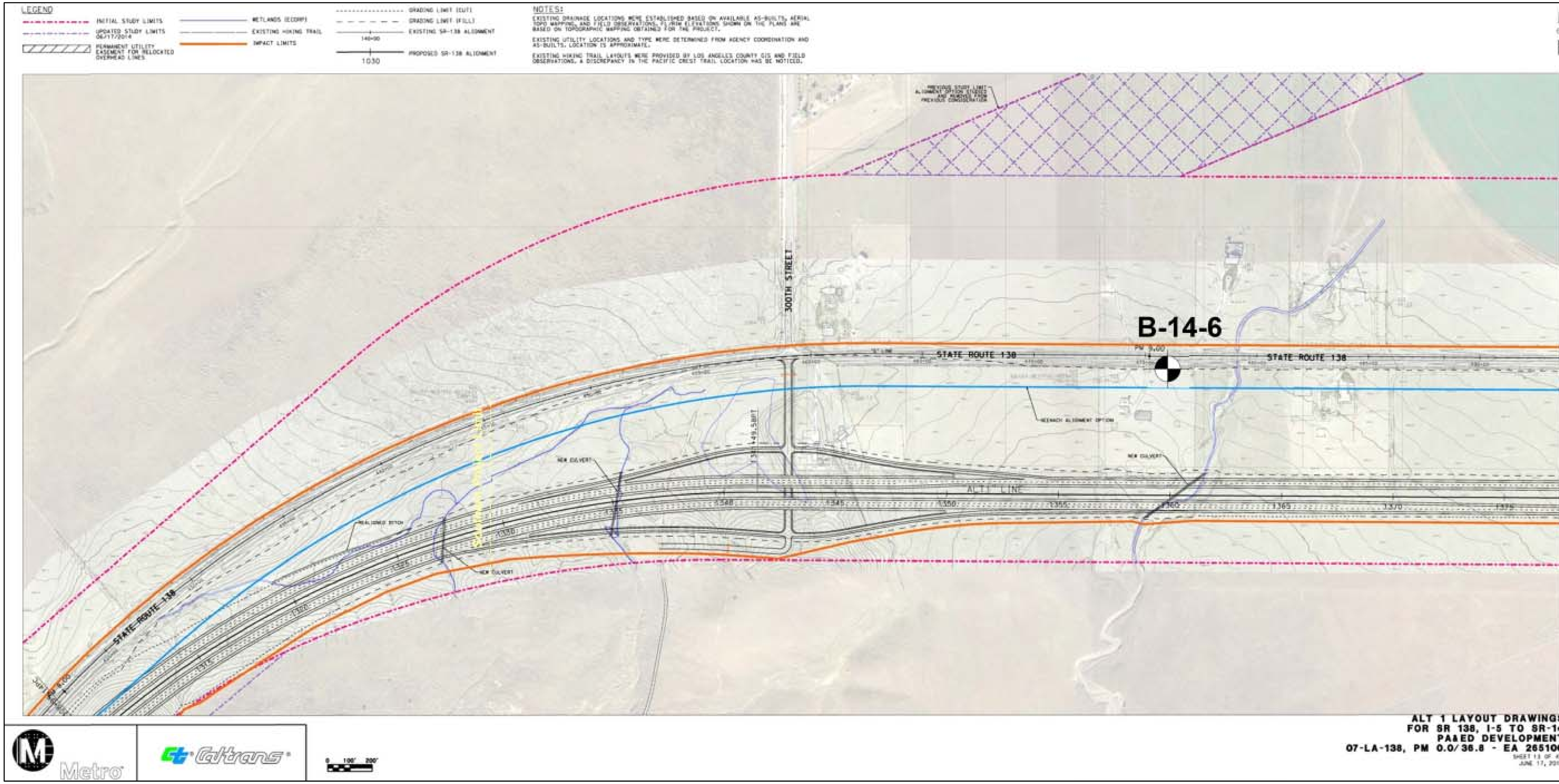
Source: Geotechnical Report, 2015, KHA

Figure 43 Boring Location Plan (5 of 6)



Source: Geotechnical Report, 2015, KHA

Figure 44 Boring Location Plan (6 of 6)



Source: Geotechnical Report, 2015, KHA

Soil Corrosivity
Two soil samples were collected along the SR-138 alignment and were tested for the preliminary corrosion investigation. These tests are performed to determine minimum resistivity, pH, soluble sulfate content, and soluble chloride content. Tests were performed using procedures described in California Test Methods 417, 422, and 643 respectively. Test results are presented below.

Table 71: Soil Corrosion Test Results

Boring	Approximate Station along SR-138	Sample Depth (feet)	Soil Type (USCS)	Minimum Resistivity (ohm-cm)	pH	Soluble Sulfate Content (ppm)	Soluble Chloride Content (ppm)
B-14-3	1262+60	0-3	SP-SM	1,900	7.2	50	10
B-146	1360+00	0-3	SC	3,200	7.2	90	11

Source: Geotechnical Report, 2015, KHA

Caltrans Corrosion Guidelines (2012b) states that a site's soil is considered to be corrosive if one or more of the following conditions exist for soil and/or water samples taken from the site:

- The pH is 5.5 or less
- Sulfate concentration is 2,000 ppm or greater
- Chloride concentration is 500 ppm or greater

Based on the test results and the Caltrans criteria, the on-site soils are considered to be non-corrosive to bare metals and concrete. Because of the prevalence of granular soils at the site, corrosion is not expected to be a design issue.

Environmental Consequences

<u>Short-Term Construction Impacts</u>
No Build Alternative
Under the No-Build Alternative, there would be no modifications to existing structures, except for improvements proposed as part of other approved or pending transportation projects; therefore, this alternative would not result in any short-term construction impacts related to geology, soils, seismicity, and topography.

Alternative 1 and Alternative 2
The project would require ground disturbance to implement the proposed improvements, and exposed soils could result in soil erosion during construction of the build alternatives. In addition, a large amount of cuts and excavations would be required during construction, although the majority of the cuts and excavations would be relatively minor (about five feet). During construction, the cut slopes could become unstable, resulting in surficial instability and landslides. With the implementation of avoidance, minimization, and mitigation measures described below, these impacts would be substantially minimized. In addition, potential impacts would be temporary, and exposed soils and cut slopes would be stabilized after construction is complete. Therefore, the build alternatives would not result in substantial short-term construction impacts related to geology, soils, seismicity, and topography.

Long-Term Operational Impacts

No Build Alternative

As no ground disturbance would occur under the No Build Alternative, there would be no impacts on topography or on the existing geologic, soils, or seismic hazards in the project area.

Alternative 1 and Alternative 2

Seismicity

The project alignment is located in an Alquist-Priolo Special Studies Zone, which indicates that the roadway and other supporting structures (e.g., retaining walls, over-crossing structure at Gorman Post Road, outlet structure at Quail Lake, and new or extended culverts) could be susceptible to damage from fault rupture during a seismic event. The proposed improvements would be designed to meet current standards, which would minimize the vulnerability of the roadway and supporting structures to damage from fault rupture. In addition, special design considerations would be incorporated into the seismic design of retaining walls within the Alquist-Priolo Special Studies Zone to mitigate potential impacts. With implementation of standard design features and mitigation measures, potential impacts from fault rupture would be substantially minimized, and no adverse impacts on the existing risk of fault rupture would result from the build alternatives.

The potential for liquefaction in the project area is low because the groundwater depth is too deep for the subsurface materials to be susceptible to liquefaction during a seismic event. In addition, the potential for seismically-induced settlement is not anticipated to be substantial, and potential settlement would not result in adverse impacts on the stability of the embankments and bridge structures. Therefore, the project would not be expected to result in adverse impacts related to liquefaction and seismically-induced settlement.

During a seismic event, Quail Lake would be susceptible to the risk of seiches, which could result in flooding in the area of the proposed improvements. However, these impacts would be reduced by incorporating design measures into the project. Therefore, potential impacts would be substantially minimized, and no adverse impacts on the existing risk of seiches would result from the build alternatives.

Geology, Soils, and Topography

Geologic, soils, and topographic hazards in the project area, including soil erosion, settlement, and slope instability, are considered minimal because the project area has flat terrain, the bedrock hills in the project area are resistant to erosion, and current groundwater and surface hydrologic conditions make the potential for hydroconsolidation or soil collapse unlikely. In addition, with the implementation of standard best management practices (BMPs) the likelihood of soil erosion or slope instability would be minimal because areas with exposed soils or cut slopes would be stabilized after construction. Therefore, the build alternatives would not result in adverse impacts from geologic, soils, and topographic hazards.

According to the Antelope Valley Area Plan, there are no officially designated natural landmarks or geological features in the project area; therefore, the project would not result in any impacts on these features.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimization measures would be implemented during construction to avoid or minimize adverse geological and topographic effects to structures. Standard BMPs would also be incorporated into the project to minimize the effects of soil erosion during construction. With the implementation of these measures, no adverse impacts are anticipated in relation to soil erosion.

GEO-1: The proposed improvements would be designed to meet current standards, which would minimize the vulnerability of the roadway and supporting structures to damage from fault rupture. Special design considerations would be incorporated into the seismic design of retaining walls within the Alquist-Priolo Special Studies Zone to minimize potential impacts.

GEO-2: During a seismic event, Quail Lake would be susceptible to the risk of seiches, which could result in flooding in the area of the proposed improvements. Therefore, seismic design features shall be incorporated into the project to minimize potential impacts on the risk of seiches.

GEO-3: Where compacted fill would be used, existing compressible surficial materials including topsoil, loose, soft alluvium, or fill soil, dry or saturated soil and otherwise unsuitable materials must be removed prior to fill placement.

- A minimum over excavation of two feet is recommended within all areas that would receive fill; the over excavation should extend horizontally with a minimum distance of two feet from edges of new fills.
- Fill on sloping ground should be properly keyed and benched into existing ground and placed as specified in Caltrans Standard Specifications.
- Overexcavations should be observed by qualified geotechnical personnel to verify that firm and unyielding bottoms are exposed.

GEO-4: Settlement magnitude and settlement period should be evaluated using site-specific soil borings and laboratory test results during the PS&E phase. Settlement, global stability, and surficial stability of all fill slopes would be evaluated during the PS&E phase.

GEO-5: For cut slopes with a gradient of 4H: 1V or flatter, surficial stability is not a design concern. The following measures or a combination of the measures can be used to minimize surficial instability for cut slopes with a gradient of 2H: 1V:

- Cover the upper four feet of slope face using materials with a minimum internal friction angle of 30 degrees and a minimum cohesion of 180 psf. This Select Material should be properly keyed and benched into the sloping ground. This would require over-cutting the slope and re-building the slope with the above Select Material.
- Cover the slope face with special man-made erosion control mats or geo-fabric.
- Plant the slope face with low-maintenance ground cover that is adaptable to the desert-like arid conditions. A landscape architect specializing in arid environments should be consulted to select the appropriate ground cover.
- Use slope benching to flatten the overall gradient of the cut slope; the bench would also reduce the velocity of water flowing past the slope face. Treatment of the slope face using Select Material, slope planting, or special matting is required.

GEO-6: Where steeper slopes are to be retained, modified standard plan design or special-design walls would be required.

GEO-7: Modified standard plan design and/ or special-design walls would be needed for seismic design of all wall types within the San Andreas Fault zone. Large ground accelerations and lateral displacements could occur in this area and special designs must be considered.

GEO-8*:* The minimum erosion control measures considered for this project would include:

- Move-in/Move-out (Erosion Control)
- Fiber rolls
- Rolled Erosion Control Product (Netting)
- All work in waterways would be scheduled per regulatory requirements and would be detailed in the project's special provisions during the PS&E phase. Maintenance pullouts would be considered for the project, and side slopes would be specified as flat as possible to minimize erosion and for ease of maintenance. Concentrated flows would be collected into stabilized earth ditches or lined ditches.

GEO-9: Given seismic concerns in the area adjacent to the San Andreas Fault, a fault study shall be completed during the design phase. Special structure design shall be incorporated into the new bridge location near Gorman Post Road to tolerate potential offset due to fault rupture.

Cumulative Impacts

With implementation of the above avoidance and minimization measures and BMPs the project would not be expected to result in substantial impacts related to soil erosion and the proposed project would not contribute to cumulatively considerable environmental impacts.

3.2.4 PALEONTOLOGY

Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

16 United States Code (USC) 461-467 (the National Registry of Natural Landmarks) establishes the National Natural Landmarks (NNL) program. Under this program property owners agree to protect biological and geological resources such as paleontological features. Federal agencies and their agents must consider the existence and location of designated NNLs, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under NEPA.

23 United States Code (USC) 1.9(a) requires that the use of federal-aid funds must be in conformity with federal and state law.

23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

Affected Environment
A combined Paleontological Identification and Evaluation Report (PIR/PER) with a Preliminary Paleontological Mitigation Plan for the SR-138 Northwest Corridor Improvement Report was prepared in May 2015.

Regional Geologic Setting
The PSA is situated in northern Los Angeles County within the northern extent of the Transverse Range Geomorphic Province and the western portion of the Mojave Desert Geomorphic Province. The Transverse Ranges are an east-west trending series of mountain ranges and valleys that run oblique to the normal northwest trend of mountain ranges in coastal California. These ranges are the result of the Pacific and North American Plates grinding past each other and "catching" along the bend in the San Andreas Fault Zone. The Transverse Ranges Geomorphic Province is one of the most rapidly rising regions of the earth due to intense north-south compression (Wagner 2002). Only the westernmost portion of the PSA is located within the Transverse Range Geomorphic Province; it is specifically within the Ridge Basin. The Ridge Basin is a small sedimentary basin bounded by the San Andreas Fault to the northeast and the San Gabriel Fault to the southwest that is approximately located between the cities of Castaic and Gorman. Sediments of the Ridge Basin are well exposed and document the change from a marine environment to a lacustrine and alluvial environment (Crowell and Link, 1982). The majority of the PSA is located within the Mojave Desert Geomorphic Province, also known as the Mojave block. The Mojave block is bounded by the San Andreas Fault to the south and Garlock Fault to the north. It is a seismically active area that is characterized by isolated mountain ranges separated by desert plains (Hall 2007; Wagner 2002).

Project Geology
Sediments of the PSA are Holocene to Jurassic in age. Units mapped at the surface include Holocene alluvial and lake sediments, Pleistocene older alluvial sediments, Pliocene to Miocene Ridge Basin Group, Miocene Santa Margarita Formation (formerly Miocene Oso Canyon and Miocene Quail Lake formations), Miocene Neenach Volcanic Formation, and Jurassic to Cretaceous quartz diorite (Dibblee 2002ab, 2006, 2008ab). All are sedimentary rocks except the last two.

Jurassic to Cretaceous Quartz Diorite
Within the PSA, the Jurassic to Cretaceous (199.6 to 65.5 million years old) quartz diorite (qd) consist of massive, gray to nearly white, medium to coarse grained and biotite rich rock (Dibblee 2006, 2008a; Figure 3a). This unit has no potential to yield fossils due to its igneous origin.

Early Miocene Neenach Volcanic Formation
The Neenach Volcanic Formation (Tna) consists of extrusive volcanic rocks dating from the early Miocene (23.03 to 15.97 million years ago). Within the PSA, this formation is composed of dark to red-brown andesite flows and flow breccia. In some places, weathered phenocrysts of biotite are present (Dibblee 2008a; Figure 3b). This unit has no potential to yield fossils due to its igneous origin.

Late Miocene Santa Margarita Formation
Sediments of the brackish water to marine portion of the Santa Margarita Formation (formerly the Quail Lake Formation; Figures 3a, 3b) were emplaced during the late Miocene (11.61 to 5.33 million years ago). Sandstone (Tqs) is massive to bedded, light gray to tan, and medium to coarse grained. It is moderately hard and commonly conglomeratic at its base (Figures 3a, 3b). A silty siliceous shale unit is

also present within the PSA (Figure 3a; Dibblee 2006, 2008a). The Quail Lake Formation was reallocated to Santa Margarita Formation since mapped by Dibblee (Dibblee 2006, 2008a; GEOLEX 2014).

The non-marine portion of the Santa Margarita Formation (formerly the Oso Canyon Formation; Toc; Figures 3a, 3b) was deposited during the late Miocene. These sediments are characterized by gray to red sandstone, siltstone, and conglomerate. The sandstone is fine to coarse grained, friable, and often gritty or conglomeratic. Siltstone within the formation is soft, greenish gray to red, micaceous, and often pebbly. The conglomerate is made up of moderately sorted pebbles and cobbles of granitic and rhyolitic volcanic detritus (Dibblee 2006, 2008a). The Oso Canyon Formation was reallocated to Santa Margarita Formation since being mapped by Dibblee (Dibblee 2006, 2008a; GEOLEX 2014).

Lower Miocene Ridge Route Formation

Of the five geologic subunits of the Miocene to Pliocene (23.03 to 2.588 million years ago) Ridge Basin Group, only two, the Hungry Valley Formation and Ridge Route Formation are present within the PSA. Sediments of the Ridge Route Formation (Trri) were deposited during the lower Miocene (23.03 to 15.97 million years ago). The formation is characterized by lithified, gray to tan, interbedded sandstone and claystone (Dibblee 2002a, 2006; Figure 3a).

Upper Pliocene Hungry Valley Formation

Part of the Ridge Basin group, the Hungry Valley Formation is broken into three subunits; undivided Hungry Valley Formation (Thv), an upper member (Thvc) and a lower member (Thvs). Only the lower member of the Hungry Valley Formation is present within the PSA. The Hungry Valley Formation consists of non-marine, fluviatile sedimentary sequences that are middle to upper Pliocene in age (3.6 to 2.588 million years ago). The sediments of the lower member are weakly indurated and are composed of light gray to white sandstone with reddish claystone interbeds (Dibblee 2002a, 2006; Figure 3a).

Pleistocene Older Alluvial Sediments

This unit consists of Pleistocene (2.59 million to 11.7 thousand years old) alluvial gravel, sand, and detritus (Qoa). Sediments are loose to weekly consolidated and poorly bedded (Dibblee 2002a, 2006, 2008a; Figures 3a-3d).

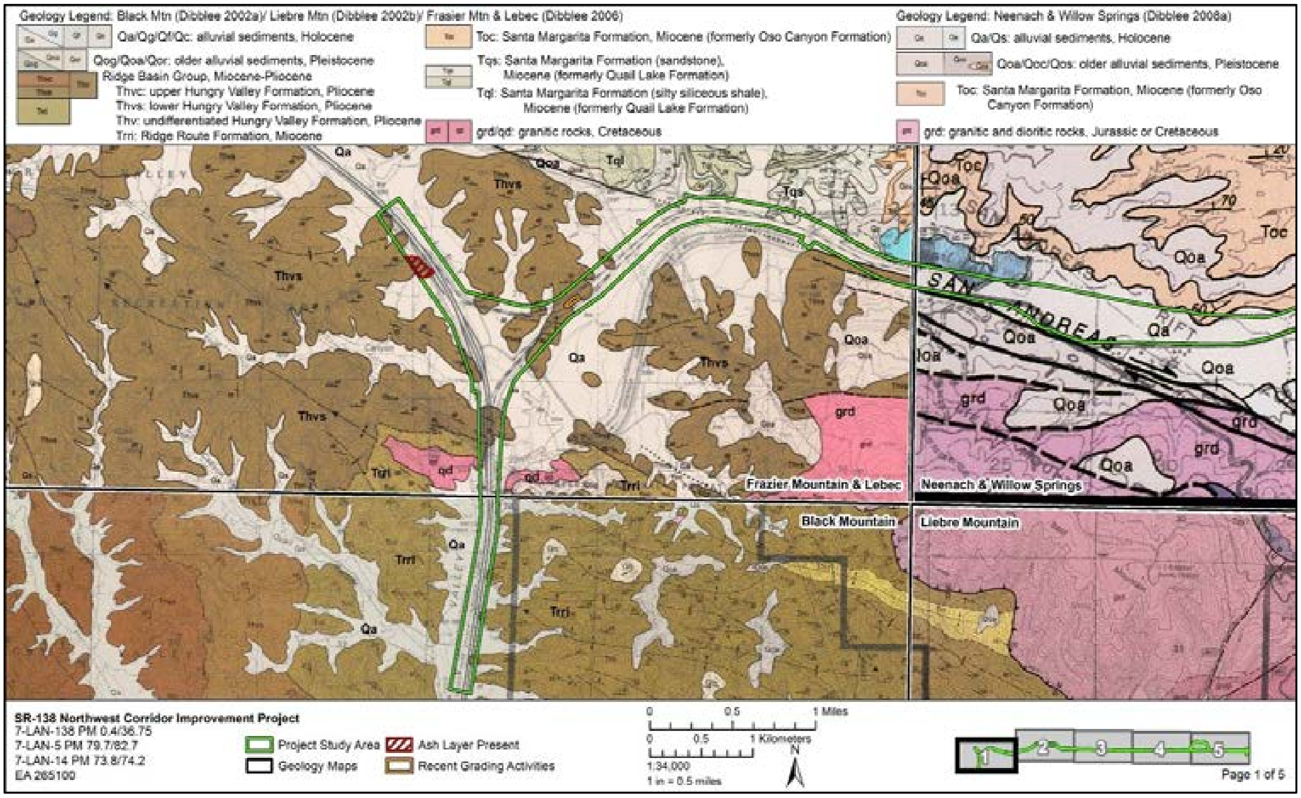
Holocene Alluvial Sediments

These young, surficial sediments (Qa) were deposited in valley areas during the Holocene (<11.7 thousand years ago). Sediments consist of unconsolidated, undissected alluvial silt, sand, and gravel (Dibblee 2002ab, 2006, 2008ab; Figures 3a-3e).

Holocene Lake Clay Deposits

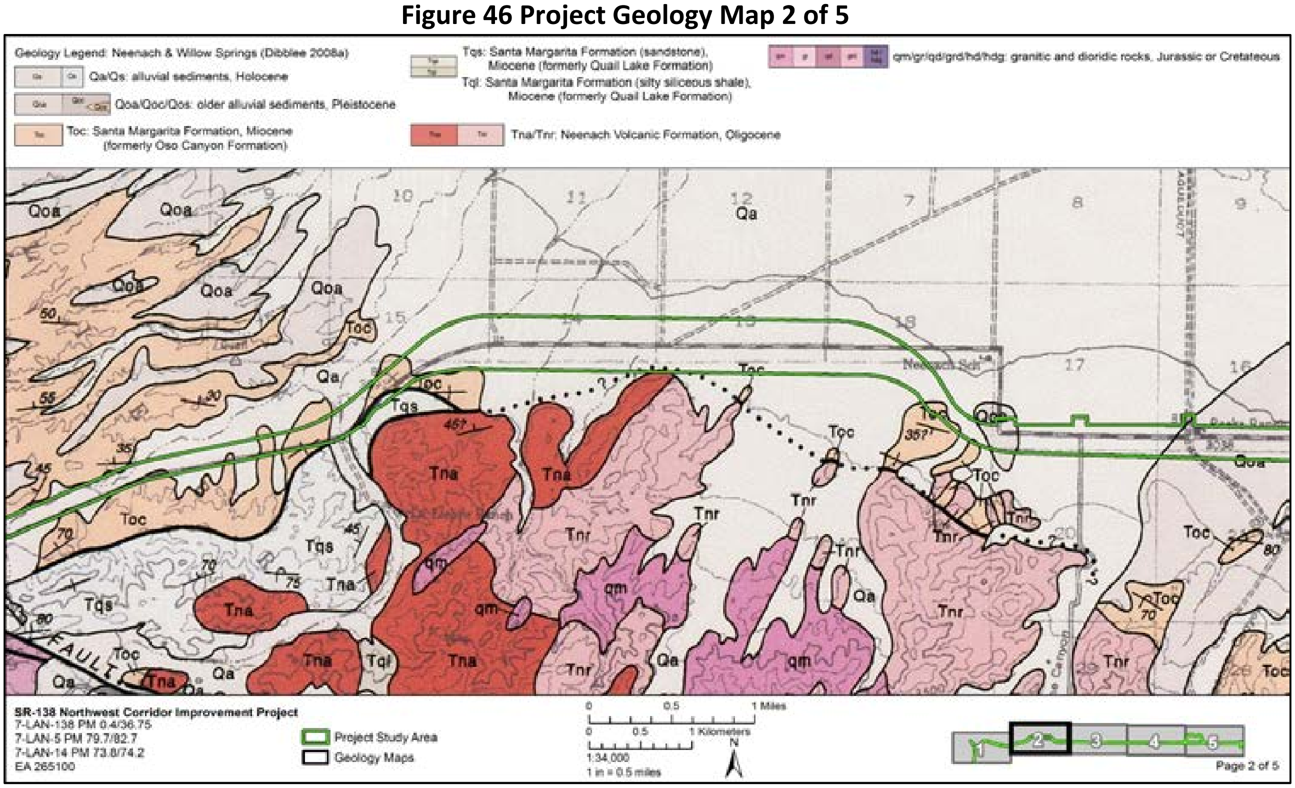
Holocene lake clay deposits (Qc) are present to the west and southwest of Quail Lake (Dibblee 2006; Figures 3a).

Figure 45 Project Geology Map 1 of 5



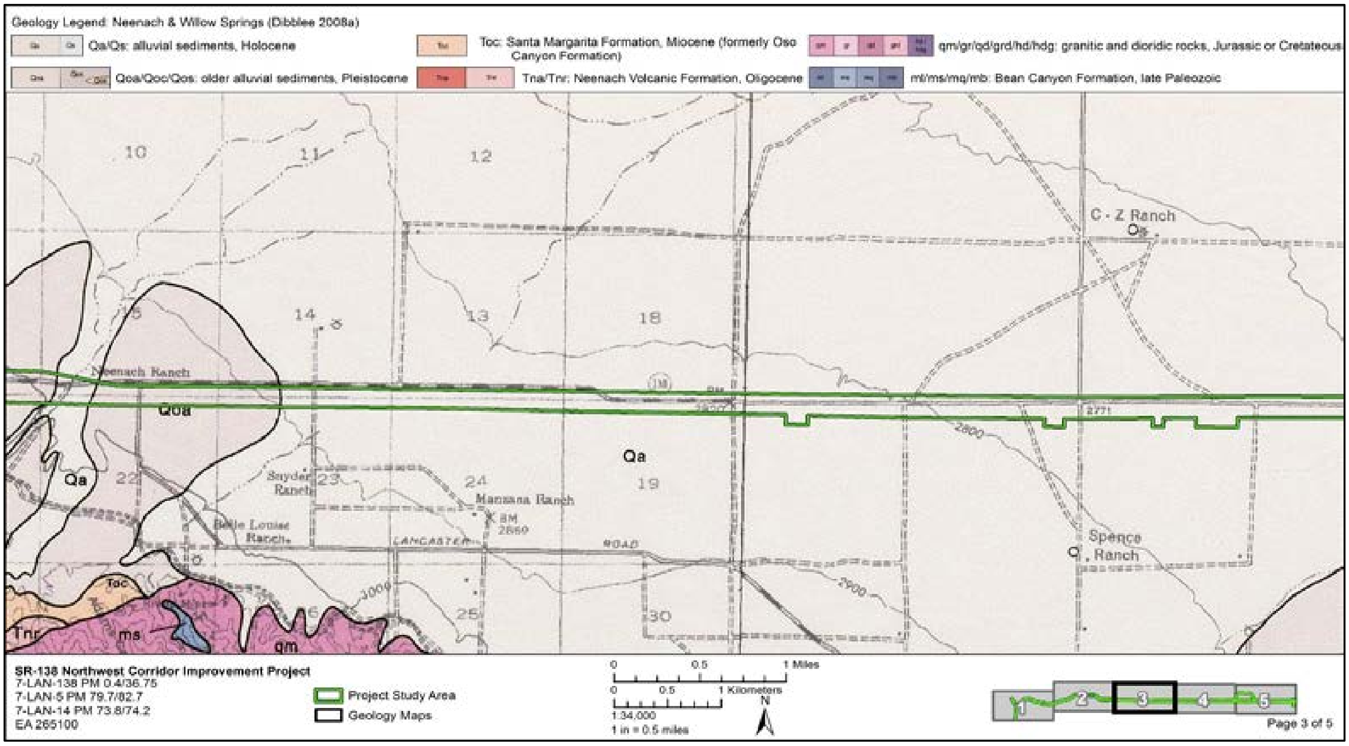
Source: Caltrans, Combined Paleontological Identification and Evaluation Report, December 2014

Figure 46 Project Geology Map 2 of 5



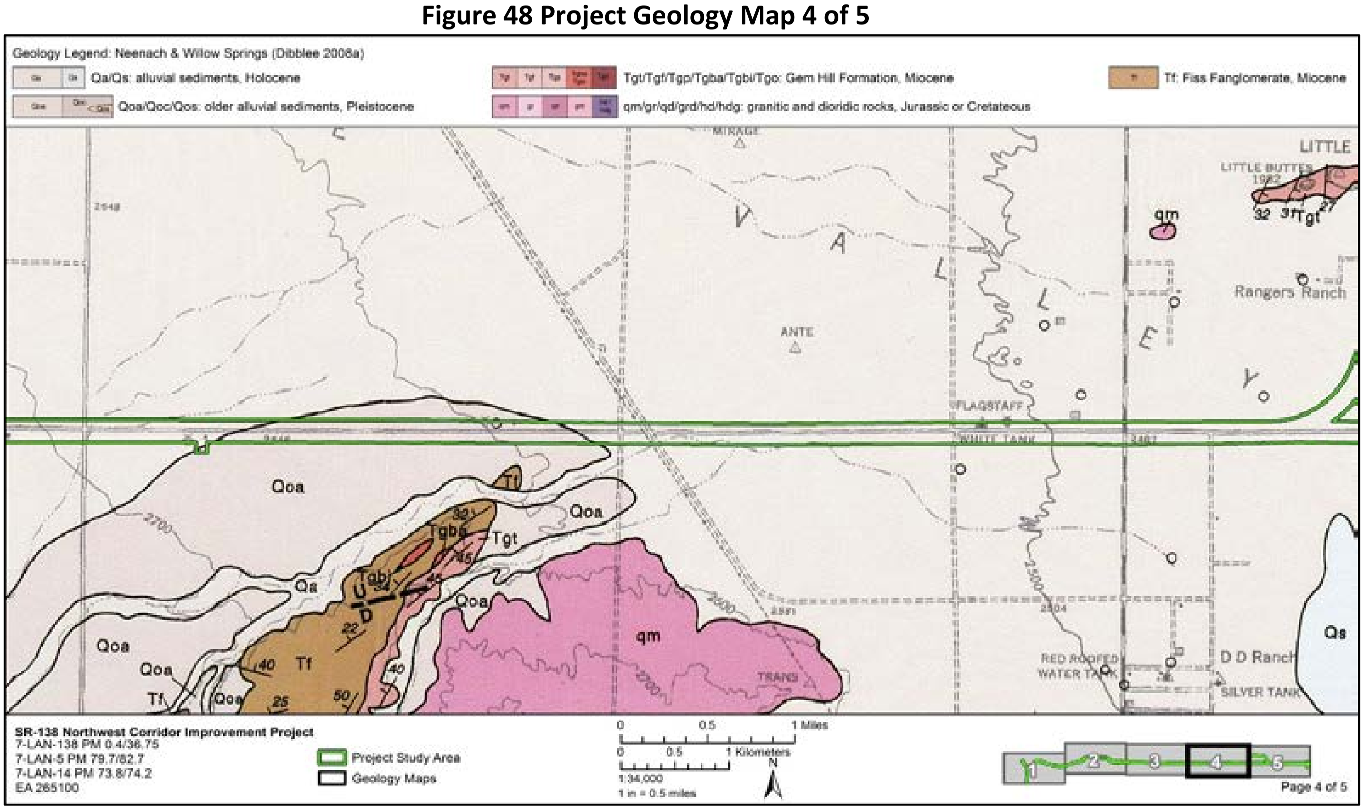
Source: Caltrans, Combined Paleontological Identification and Evaluation Report, December 2014

Figure 47 Project Geology Map 3 of 5



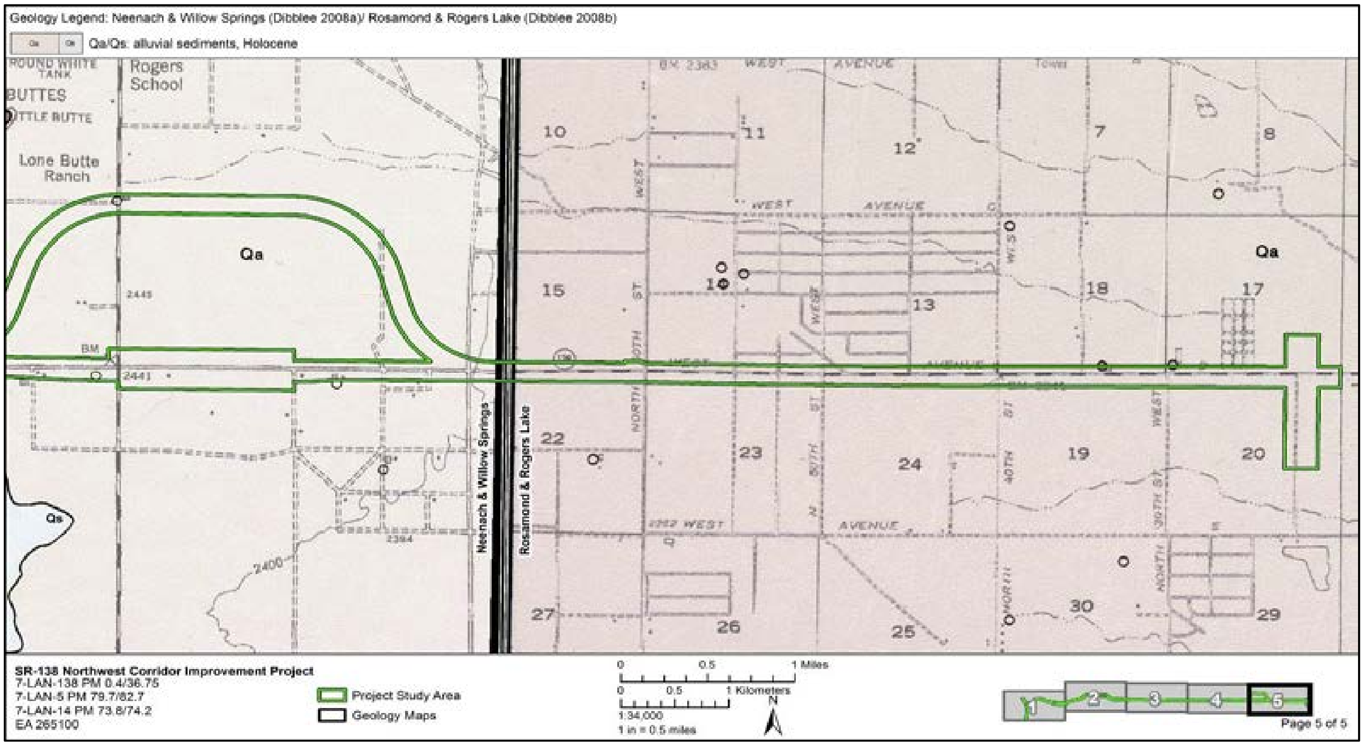
Source: Caltrans, Combined Paleontological Identification and Evaluation Report, December 2014

Figure 48 Project Geology Map 4 of 5



Source: Caltrans, Combined Paleontological Identification and Evaluation Report, December 2014

Figure 49 Project Geology Map 5 of 5



Source: Caltrans, Combined Paleontological Identification and Evaluation Report, December 2014

<u>Paleontological Record Search and Literature Review</u>

Record searches were requested from the Natural History Museum of Los Angeles County (LACM) and the University of California Museum of Paleontology at Berkeley (UCMP). Neither LACM nor UCMP have records of fossils occurring within the PSA. Vertebrate fossils are known from the Ridge Route Formation, and Quaternary alluvial sediments nearby.

The LACM records did not distinguish between the Ridge Route and Hungry Valley Formation and are thus referred to together as the Ridge Route Group. Recovered specimens include rhinoceros, elephant, horse, camel, pronghorn, ground sloth, tapir, tortoise, turtle, bird, and fish. Depth of recovery of fossils from the Ridge Route Group was not recorded. However, this is an older unit exposed at the surface in the project area and fossils can occur throughout. Quaternary alluvium has yielded lizard, snake, rodent, and rabbit in the vicinity.

No vertebrate fossils are known near the PSA from the Santa Margarita Formation [formerly Quail Lake Formation (marine) and Oso Canyon Formation (nonmarine)], however the marine facies has known invertebrate fossils and both the marine and nonmarine facies have the potential for vertebrate material based on records in surrounding counties.

<u>Field Reconnaissance</u>

A paleontological survey was conducted and all Pleistocene and older sedimentary units were thoroughly examined for fossil resources present on the surface and the geological mapping was ground truthed. Although no fossils were observed during the field reconnaissance, sediments conducive for fossil resources were observed.

Much of the PSA off SR-138 was inaccessible as it was on private land. No foot survey was required from the eastern end of the PSA to approximately 210th Street West. All of these eastern sediments were Holocene alluvium typical of the Mojave Desert adjacent to the Transverse Ranges. Windshield survey was performed to confirm that no ditches or drainages were present along the right of way that may expose older sediments at depth. None were observed. These Holocene sediments vary in coarseness based on the distance to the foothills. The Holocene lake deposits mapped at the western end of Quail Lake were inaccessible.

Paleontological Sensitivity

Caltrans utilizes a tripartite scale to characterize paleontological sensitivity consisting of no potential, low potential and high potential. A multilevel ranking system was developed by professional resource managers as a more practical tool, the Potential Fossil Yield Classification (PFYC) system, which has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings and is therefore used to complement the Caltrans scale.

Occurrences of fossil resources are closely tied to the geologic units (e.g., formations or members) that contain them. The probability for finding noteworthy fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area.

Using the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. This ranking is not designed to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment. Geological setting and fossil localities were considered in determining paleontological sensitivity according to PFYC criteria.

Jurassic to Cretaceous quartz diorite and Miocene Neenach Volcanic Formation were assigned as Caltrans no sensitivity and PFYC 1 as they have no potential to yield fossils due to their igneous origin. Neither unit requires paleontological monitoring. The Holocene alluvial and lake deposits were ranked as low sensitivity on both the Caltrans and PFYC (2) scales. Due to their young age, they are not sensitive for fossil resources. The Miocene Santa Margarita Formation (formerly Quail Lake and Oso Canyon formations) were ranked as Caltrans low sensitivity and PFYC 3b with an undemonstrated yield as no vertebrate fossils are known from these formations within the Project vicinity. The Ridge Route Formation, lower member of the Hungry Valley Formation, and Pleistocene Older Alluvial Sediments were ranked as Caltrans high and PFYC 3a indicating moderate potential but unpredictable location of occurrence. No Project rock units were ranked higher than PFYC 3.

At present, the Project lacks detailed information on the proposed locations and depth of cuts. As such this sensitivity map only covers the surficial geology and does not address the sensitivity of units that appear subsurficially. Additionally, no geologic cross-sections were available so the appearance of potentially sensitive units at depth is uncertain at this time.

Environmental Consequences

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;

2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;

3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;

4. The fossils demonstrate unusual or spectacular circumstances in the history of life;

5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations (Scott and Springer 2003, Scott et al. 2004).

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important.

The potential to affect any fossils varies with depth of impacts, previous disturbance and presence of non-fossiliferous sediments. Logistics of excavation also affect the possibility of recovering scientifically significant fossils since, as outlined above, information on exact location, vertical elevation, rock unit of origin, and other aspects of context are critical.

All Build Alternatives would create surface or subsurface impacts that may adversely impact potential paleontological resources. Vertical impacts of construction are at present unknown as the designs have yet to be completed, however are expected to be as much as 58 feet deep for structure foundations. Even shallow excavations in areas mapped as Pleistocene alluvial deposits, the Ridge Route Formation, the Hungry Valley Formation, and the Santa Margarita Formation have the potential to encounter paleontological resources. Due to the depth, excavations also have the potential to impact fossils in the Holocene alluvial deposits present throughout most of the site.

Cumulative Impacts

The Resource Study Area (RSA) for the purpose of the paleontological resources cumulative analysis is the project study area. The area includes all locations that would be subjected to subsurface ground disturbance under all of the alternatives for the proposed project.

<u>Reasonably Foreseeable Actions and Their Impacts</u>

The Centennial Specific Plan and Project and AV Solar Ranch One are both within the Paleontological RSA. There are no fossil localities (i.e., locations at which paleontological resources have been documented) within the RSA. Also, no rock formations were identified in the AV Solar Ranch One Project area that contain potential paleontological sensitivity. However, direct evidence indicates the presence of paleontological resources within the Centennial Specific Plan and Project area, and geologic evidence from adjacent areas with similar sedimentary formations indicates a high likelihood of encountering additional resources during project development.

Potential paleontological resource impacts from the proposed project would be associated with short-term activities such as excavation and grading, although such impacts would be considered long-term because the associated loss of resource values would be permanent. Cumulative impacts to paleontological resources can occur when development of an area results in the removal of paleontological resources, which could degrade the physical historical record of an area. The Centennial Specific Plan and Project has the potential to encounter paleontological resources in the area mapped as Miocene Santa Margarita Formation. These actions could contribute to a progressive loss of paleontological resources and result in an adverse cumulative impact. However, the Centennial Specific Plan and Project would reduce potential paleontological resources impacts to a level considered less than significant through the application of mitigation measures. Mitigation of these potential impacts would include measures for salvage of presently exposed fossils, monitoring earth-moving activities; temporary isolation of discovered fossil resources; and their recovery, preservation, reporting, and curation. The proposed project would reduce potential paleontological resources with implementation of the avoidance, minimization, and/or mitigation measures listed in the section below. As a result the proposed project, in combination with the cumulative projects, would not result in an adverse cumulative impact.

Avoidance, Minimization, and Mitigation Measures

The project has the potential to adversely impact scientifically valuable paleontological resources. Geologic units can be laterally extensive making avoidance of paleontological resources through project redesign impossible. Minimization of impacts is unrealistic for the same reason. Impacts to paleontological resources can be reduced through mitigation. Mitigation would include the preparation of a paleontological resources mitigation plan after design is nearly complete and excavation locations and depths are defined and implementation of the plan during construction. Implementation of the paleontological resources mitigation plan would guide and facilitate the identification and treatment of paleontological resources located during the Project in an effort to reduce adverse effects on significant resources.

Definition of Paleontologically Sensitive Areas

Units with moderate potential for paleontological resources include the Ridge Route, Hungry Valley, and Santa Margarita formations as well as the Pleistocene older alluvial sediments. The Holocene alluvial and lake deposits have a low potential for fossils, however these sediments frequently lie atop Pleistocene older alluvium in valleys, but can also cover any other units mapped locally. Neither the Jurassic to Cretaceous quartz diorite nor the Miocene Neenach Volcanic Formation have any potential for fossil resources.

PALEO – 1 A Paleontological Mitigation Plan will be prepared by qualified Principal Paleontologist after the location and extent of the project excavation has been defined. The Plan will establish monitoring locations and frequency based on the sensitivity of the geologic units and the location and extent of the planned excavation activities.

PALEO – 2 The qualified Principal Paleontologist would meet the qualifications outlined under preparer qualifications in the Caltrans Standard Environmental Reference, Volume 1, Chapter 8, Paleontology. The Principal Paleontologist would be responsible for implementing the mitigation plan and maintaining professional standards of work. The Principal Paleontologist would designate a project team that includes a qualified field supervisor and qualified monitors.

PALEO-3 All paleontological personnel would receive a copy of the paleontological mitigation plan, daily forms and appropriate maps and would read and sign the Code of Safe Practices. All paleontological personnel would receive any mandated safety training and environmental awareness training before performing any work.

PALEO -4 Monitors would be fielded for all excavations in the Ridge Route, Hungry Valley, and Santa Margarita formations as well as the Pleistocene older alluvial sediments. All excavations greater than 11 feet deep in the Holocene sediments would be monitored.

PALEO-5 All monitoring paperwork and photographs would be submitted to the Principal Paleontologist weekly. As needed, paperwork and photographs would be submitted to the Caltrans Task Manager/Paleontology Coordinator.

PALEO-6 Upon conclusion of earthmoving, a final Paleontological Mitigation Report (PMR) would be prepared. The report would be submitted to the Caltrans Task Manager/ Paleontology Coordinator for approval. Copies of the final report would go to Caltrans, the repository if scientifically valuable fossils have been collected, and other parties as requested.

PALEO-7 Discovery of fossils potentially meeting significance criteria requires immediate notice to the Caltrans Task Manager/ Paleontology Coordinator for the project. Agency personnel would be party to all discussions regarding recovery, documentation, analysis and curation.

PALEO-8 Fossils meeting significance criteria would be curated in perpetuity at a Caltrans approved repository along with all project data and a copy of the final report. The repository will be identified in the Paleontological Resources Mitigation Plan.

The Mitigation measures discussed above would lessen any impacts to less than significant.

3.2.5 HAZARDOUS WASTE/ MATERIALS

Regulatory Setting

Hazardous materials including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage, and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the <u>Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA)</u> and the <u>Resource Conservation and Recovery Act of 1976 (RCRA)</u>. The purpose of CERCLA, often referred to as “Superfund,” is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires clean up of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean up of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Affected Environment

The Initial Site Assessment (ISA) was completed in May 2015 for the proposed project. The ISA addresses potential hazardous waste concerns associated with the project alternatives currently under consideration. Under federal and State environmental laws, acquisition of contaminated property creates permanent liability for the new property owner. Project proponents must exercise due diligence to prevent acquisition of contaminated property that may create long-term liability or detrimentally affect project cost, scope, or schedule.

The ISA was performed in accordance with the practices identified in the ASTM *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, ASTM Designation E1527-13 and Title 40 of the Code of Federal Regulations (CFR), Part 312, which specifies standards and practices for "all appropriate inquiries" (AAI) required for persons seeking to establish certain defenses to or protections from liability under the Federal Comprehensive Environmental Response, Cleanup and Liability Act (CERCLA). The Federal rule 40 CFR 312.11(a) identifies a Phase I ISA completed in accordance with the E1527-13 practice as one way to achieve compliance with requirements of the AAI rule.

The objective of this ISA was to identify Recognized Environmental Conditions (RECs), Controlled Recognized Environmental Conditions (CRECs) or Historical Recognized Environmental Conditions (HRECs), as defined under ASTM E-1527-13:

REC: The presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions.

HREC: A past or historical release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted residential use criteria established by a regulatory authority, without subjecting the property to any required controls (e.g., property use restrictions, AULs, institutional controls, or engineering controls). Before calling the past release an HREC, the Environmental Professional must determine whether the past release is a REC at the time the ISA is conducted (e.g., if there has been a change in the regulatory criteria).

CREC: A controlled recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (e.g., as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (e.g., property use restrictions, activity and use limitations, institutional controls, or engineering controls).

The scope of work of the ISA included a review of project construction plans and aerial photographs, reconnaissance of properties from the public ROW within the study limits, review of government environmental databases, historical Sanborn Fire Insurance maps, and historical aerial and topographic maps. The table below describes features and properties observed in or near the proposed ROW.

Table 72: Adjacent Property Features

Property Type (address)	Description
Roadway Materials Storage	This is property used to store gravels, sands, and asphalt possibly for highway maintenance projects. The property is sandwiched between the SR138 east and west lanes at the interchange of SR138 with I-5. The source of material stockpiles is unknown. The features on the property do not appear to be located within the proposed Alternatives' ROWs.
Fairmount Market Service Station 22847 West Ave. D 3278-025-006	This property is located on the northeast corner of the SR138/230th Street West intersection. Features observed include: four dispensers, access covers identifying the locations of the USTs, and a propane AST. Also on the property is a single story structure used as a market. The features on the property do not appear to be located within the proposed Alternatives' ROWs.
Vacant Property Capped well 3236-001-900	A capped 10-inch diameter well casing was observed approximately 185 feet south of the current SR138 ROW and 95 feet east of 155th Street West. The well is on property that historically was used for agricultural purposes (Section 5.0) and appears to be located within the Alternative 1 boundary.
Auto Storage Yard 27000 West. Ave. D 3279-001-004	Property is used for auto storage. Features observed include: metal frame storage building, multiple vehicles in varying stages of functionality, metals scrap and debris. This property was not accessible during the reconnaissance. The Site features appear to be located within the Alternative 1 and 2 proposed ROWs.
Vacant Property Capped well 3115-012-040	A concrete encased, capped well (with welded lid) was observed approximately 380 feet north of SR138, and approximately 150 feet east of 30th Street West. There is a dry retention basin located immediately north of this well. The features on the property do not appear to be located within the proposed Alternatives' ROWs.
Former Agricultural Site 3262-022-001	This property contains former structure foundations, a water well, a dry retention basin, and possible sumps. The property appears to have been used for agricultural purposes. Some of these features are located north of existing SR138 and within the boundaries of the proposed Alternative1 and 2 ROWs.
Private Property 3275-012-015	This parcel is occupied by a water well and five large AST's that may have been used for water storage. The proposed Alternative 1 and 2 ROWs are located south of this facility.

Source: Caltrans, Initial Site Assessment, May 2015

Property Type (address) APN	Description
Glendale Rod and Gun Club 3115-012-038 3115-012-037	There are several dry retention basins located across these two parcels. A concrete box is located along the ridge between two basins. The features on the property do not appear to be located within the proposed Alternatives' ROWs.
California Aqueduct	The California Aqueduct is located south of all Alternatives until it crosses the existing SR138 ROW just east of 245th Street West. An extension of the Aqueduct crosses the existing SR138 again near Quail Lake and Telephone Road. The Aqueduct is not considered to be a potential REC to the Study Area. However, asbestos containing material (ACM) and lead-based paint may be present on bridges and other structures.
Farmland	A newer looking diesel AST in concrete secondary containment is located in the field of a property actively used for farming. No staining or odors were observed. The AST appears to be located within the proposed Alternative 1 and 2 ROWs.
Southern California Edison (SCE) Substation 20851 West. Ave. D 3256-010-800	A SCE Substation is located on the northeast corner of SR138/210th Street West. There were no spills or staining observed on the property. These types of facilities potentially contain fuel sources at the transformers, though none were observed. The features on the property do not appear to be located within the proposed Alternatives' ROWs.
Wee Vill Market 18348 West. Ave. D 3238-005-029	A market/restaurant facility located at the southeast corner of SR138/185th Street West. A trailer park is located behind the market to the south. Several empty 55-gallon drums and an empty tank (possible former water tank or underground storage tank (UST)) were located near the south end of the property, south of the mobile home park. An onsite cell tower is located in the northwest corner of the property. The parking area and cell tower appear to be located within the proposed Alternative 1 and 2 easement boundaries. Additional information regarding former USTs at the facility is found in Sections 5.2.1 and 5.2.3.
Country Store 28105 West Avenue C-6 3275-012-019	This is a property located on the northwest corner of 280th Street West and Lancaster Road. The layout of the property makes it a suspect historical gasoline station site. The features on the property do not appear to

Source: Caltrans, Initial Site Assessment, May 2015

Property Type (address) APN	Description
Residence 26335 West. Avenue C-15 3277-031-026	This private property is occupied by debris piles inside the onsite dry retention basin. The debris is located just north of the existing SR138 ROW and does not appear to be located within any of the proposed Alternatives' ROWs.
Private Property 49250 52nd Street 3260-013-014	This residence appears to be used to store vehicles (operational, non-operational, and junked). The vehicles appear to be stored outside of the proposed Alternatives' ROWs.
Private Property 49225 45th Street 3113-010-021	This residential property is occupied by construction and scrap debris stored at the southeast corner of the property. The debris appears to be located within the proposed Alternatives 1 and 2 ROWs.
Solar Farm	The Solar Farm occupies large areas of property located both north and south of the existing SR138 ROW. There appears to be a wide easement between existing SR138 and the solar operations and equipment. Historically, solar panels were constructed with leaded glass panels. The features on the property do not appear to be located within the proposed Alternatives' ROWs

Source: Caltrans, Initial Site Assessment, May 2015

Observations within the Study Area Outside the Proposed ROW

The properties located in the area immediately surrounding the proposed Alternatives' ROWs consisted of predominantly vacant, undeveloped desert and agricultural land with sporadic residential properties/ developments, electrical transmission lines, and dry retention basins. The features on properties observed outside of the Alternatives' ROWs do not represent environmental conditions to the proposed construction activities within the proposed Alternatives' ROWs.

A sewage treatment facility is located east of the proposed Alternatives' ROWs at the intersection of SR-138 with SR-14. This facility includes several evaporation/sewage treatment ponds. Due to the distance of these facilities and structures from the proposed Alternatives' ROWs, and the expected direction of groundwater flow to the northeast, away from proposed construction activities, it is unlikely that environmental releases or impairments resulting from activities on these facilities/properties would have a significant impact to the construction in the proposed ROW Alternatives.

POLYCHLORINATED BIPHENYLS (PCBS)

Electrical transformers, hydraulic equipment capacitors, fluorescent light fixtures, and similar equipment may contain polychlorinated biphenyls (PCBs) in the hydraulic fluids or dielectric insulating fluids within the units. The federal Toxic Substances Control Act (TSCA) generally prohibited the domestic manufacture of PCBs after 1979. There is, however, potential that the dielectric fluid in electrical and hydraulic equipment manufactured and constructed prior to that date contains PCBs.

Pole-mounted transformers associated with power lines were observed along the SR138

ROW. However, the transformers appeared in relatively good condition. As a result, PCBs from pole-mounted transformers are not considered to be a significant environmental concern to the proposed ROW.

LEAD-BASED PAINT (LBP)

Lead is a pliable, soft metal that is used in the construction of pipes, rods, and containers. Before 1978, lead was a common ingredient in paint because it added strength, shine and extended the life of the paint. In 1978 the Environmental Protection Agency (EPA) banned the use of lead pigments in paints used on interior and exterior residential surfaces. Lead poisoning can result from children having access to, and ingestion (by chewing) of lead-based paint covered surfaces. Inhalation of dust produced by normal oxidation, or scraping/sand-blasting of the paint, which may contain significant amounts of lead, is also a health hazard. The EPA and the Housing and Urban Development Department (EPA/HUD) action level for LBP is 0.5% dry weight.

Lead-based paint should be anticipated in lane striping paint (most commonly in yellow striping paint) along the current SR-138 alignment. In addition, if acquisition of additional ROW includes demolition of older structures (buildings or roadways/bridges), LBP should be anticipated on painted surfaces.

AERIALLY DEPOSITED LEAD (ADL)

Aerially deposited lead (ADL) from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the project alternatives that must be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This Agreement allows such soils to be safely reused within the project limits as long as all requirements of the Agreement are met.

TREATED WOOD WASTE (TWW)

The removal and disposal of metal beam guardrails, thrie beam barriers, piles, and roadside signs present the potential for contamination as the associated wood products are typically treated with preservation chemicals that protect the wood against insect attack and fungal decay. Wood posts removed from metal beam guard posts or signage (unless reused), are considered treated wood waste (TWW). TWW is a potential source of hazardous chemicals as they pose a risk to human health and environment. Chromated copper arsenate (CCA) is the most popular wood treatment product available today. CCA is a preservative containing chromium, copper and arsenic and has been used to pressure treat lumber since the 1940s. TWW can be handled as a solid waste, and removal and disposal of TWW shall be managed under the California Code of Regulations, Title 22, Division 4.5, Chapter 34, which specifies guidelines for storage, accumulation, shipment/transport, and disposal of TWW at specific landfills.

Environmental Consequences

The Parcel Specific Recognized Environmental Concerns (RECs) table below summarizes which parcels are considered RECs within the right-of-way for Alternatives 1 & 2.

Table 73: PARCEL SPECIFIC RECs

ALTERNATIVE	NUMBER OF PARCELS IN THE STUDY	NUMBER OF REC PARCELS	REC LOCATIONS (SITE)ID/FIGURE#)	PROPERTY	
				EASEMENT%	ROW%
1	656 (includes 94 parcels as part of the Optional Construction Loop)	5	3252-018-049 (3/9) 3279-001-004 (8/18) 3279-001-005 (9/18) 3262-022-001 (18/35) 3113-010-021 (20/41)	0.4 0.7 0 0 0	72.8 76.7 1.9 6.1 53.2
2	604	5	3252-018-049 (3/9) 3279-001-004 (8/18) 3279-001-005 (9/18) 3262-022-001 (18/35) 3113-010-021 (20/41)	0.4 0 0 0 0	72.4 71.4 1.1 2.8 23.2

Source: Caltrans, Initial Site Assessment, May 2015

The Regional RECs table below summarizes the RECs that should be considered for both Build Alternatives.

Table 74: Regional RECs

ALTERNATIVE	POTENTIALLY IMPACTED PORTION OF STUDY AREA (1)	
	AERIALLY DEPOSITED LEAD	AGRICULTURE (PESTICIDES)
1	Highway 138 construction alignment (ADL is not suspected in the area of the Antelope Acres Bypass)	Highway 138 construction alignment between 290th to the east end of the Study Area
2		

Source: Caltrans, Initial Site Assessment, May 2015

This includes portions of the study area that are privately owned parcels and existing Caltrans ROW within the construction zone.

<u>Alternative 1</u>

Five RECs, two HRECS, and no CRECs were identified in the Alternative 1 ROW. These environmental conditions include existing and former UST sites, AST sites, agricultural properties, scrap yards, auto repair, spills related to traffic accidents, private airstrips, ranches, etc. It is noted that farm and ranch fuel USTs were not regulated historically to the degree that commercial gas station USTs were and may be encountered on properties affected by the new ROW. ADL is also expected along the existing ROW. ACM and/or LBP are expected in structures and road paint, respectively, given the age of existing developments. In addition, water wells were observed from the public ROW to exist on several private properties and should be anticipated on other properties even though they may not have been observed from the public ROW.

Based on these findings, recommendations were provided to address identified e nvironmental concerns. These recommendations include additional field inspections/ reconnaissance to identify environmental concerns, interviews with property owners including farm and ranch owners concerning environmental conditions (e.g., USTs, waste disposal practices, septic systems, spills, etc.), geophysical surveys for orphan USTs, site investigations (soil sampling), ADL surveys, and ACM/LBP surveys.

Alternative 2

Five RECs, two HRECS, and no CRECs were identified in the Alternative 2 ROW. These environmental conditions include existing and former UST sites, AST sites, agricultural properties, scrap yards, auto repair, spills related to traffic accidents, private airstrips, ranches, etc. It is noted that farm and ranch fuel USTs were not regulated historically to the degree that commercial gas station USTs were and may be encountered on properties affected by the new ROW. ADL is also expected along the existing ROW. ACM and/or LBP are anticipated in structures and road paint given the age of existing developments. In addition, water wells were observed from the public ROW to exist on several private properties and should be anticipated on other properties even though they may not have been observed from the public ROW.

Based on these findings, r ecommendations were provided to address identified environmental concerns. These recommendations include additional field inspections/reconnaissance to identify environmental concerns, interviews with property owners including farm and ranch owners concerning environmental conditions (e.g., USTs, waste disposal practices, septic systems, spills, etc.), geophysical surveys for orphan USTs, site investigations (soil sampling), ADL investigation, and ACM/LBP surveys.

ASBESTOS CONTAINING MATERIALS (ACM)

Asbestos is a common term for a group of naturally occurring mineral fibers. Due to its durability and insulating quality, it was used in a wide variety of building products including structural fireproofing, pipe and duct insulation, plasters, roofing, floor tile, and linoleum. Adverse health effects have been associated with the inhalation of airborne asbestos fibers. The asbestos fibers that are tightly bound in building materials, however, do not represent an exposure hazard unless disturbed in such a way as to release airborne fibers (i.e., cutting, drilling, or sanding). By June of 1978, the United States EPA (US EPA) had effectively banned the use of asbestos in building materials.

As with all structures regardless of age, ACMs should be anticipated. It is anticipated that underground utilities within the proposed ROW may require removal or abandonment during construction activities. It should be noted that underground utilities may consist of, or be coated or wrapped with asbestos containing materials that were historically used for insulation purposes or to prevent corrosion of buried utility lines. In addition, the concrete irrigation diverters observed along the ROW may also be suspect to contain ACMs. Lead Based Paint (LBP) is a heavy metal that is found in paints of the older building structures. ACM/LBP surveys are needed to identify location of these materials and will be avoided to the extent practicable. Approximately $50,000 needs to be allocated for ACM/LBP surveys.

SOLID WASTE DISPOSAL

Other than minor amounts of scattered and windblown litter along SR-138 and intersecting roadways, no other solid waste was noted within the limits of the Study Area, aside from the debris observed located on private properties. The debris would need to be disposed of at an appropriate facility. No other solid waste disposal issues were noted within the proposed ROW.

PESTICIDES

Based on a field reconnaissance of the proposed ROW and on historical research (aerial photographs and topographic maps) numerous properties appeared to have historically been used for agricultural production of crops or orchards. Current agricultural activities were observed further north and south of the existing SR-138 ROW. As a result, potential historical pesticide use is considered a REC for both of the Build Alternatives between approximately 290th Street West to the SR-138/SR14 interchange.

RADON GAS

Radon-222 (radon) is a naturally occurring gas that is prevalent in certain areas of the country. The US EPA has determined that exposure to 4.0 picocuries per liter (pCi/L) of radon gas on a regular basis increases the risk of lung cancer.

Given that no buildings are planned to be constructed during the proposed highway construction activities, radon is not considered to be a concern to the proposed ROW.

TREATED WOOD WASTE (TWW)

The removal and disposal of metal beam guardrails, thrie beam barriers, piles, and roadside signs associated with TWW is anticipated. A preliminary estimate of 1,400 tons of TWW was calculated which would amount to approximately $210,000 for disposal.

Cumulative Impacts

The Resources Study Area for hazardous waste and materials is the project area defined in the ISA prepared for the proposed project. The RSA encompasses the proposed ROW and construction areas generally located adjacent to the existing SR-138.

The project corridor is situated on the north side of the San Gabriel Mountains, largely within the Antelope Valley that comprises the western Mojave Desert, and south of the Tehachapi Mountains. The western portion of the alignment crosses the San Andreas Fault zone and is located in the foothills of the Transverse Ranges.

The SR-138 improvements extend west to east across the Antelope Valley Watershed. The valley is generally characterized by flat, sandy terrain with widely scattered hills and isolated peaks comprised of erosion resistant bedrock formations. The valley is bounded on the south by the southeast trending San Andreas Fault zone and the Transverse Ranges. Drainage across the valley area is generally to the northeast and east. No substantial streams are present in the project area; however numerous unnamed drainages descend from the mountains along southerly margin of the valley and pass under SR-138. Drainage features in the western portion of the project area include both natural and manmade channels that either flow towards Quail Lake or in a southwesterly direction.

The majority of the SR-138 project area is within the Lancaster and Neenach sub-watersheds of the Antelope Valley Watershed. The west end of the area, at the intersection of I-5 and SR-138, is within the Hungry Valley of the Piru sub-watershed, which is part of the larger Santa Clara River watershed. The eastern portion of the project lies within the Antelope-Freemont Valley Watershed. Hydrologic features within this watershed are dominated by roadside channels and unvegetated channels flowing in a southeasterly direction, which are characteristic of desert fluvial systems. The project is located in the Antelope Valley Groundwater Basin, specifically the West Antelope Neenach and Lancaster sub-basins. Groundwater is generally approximately 140 feet below ground level along the alignment. The groundwater at western end of the alignment may be locally shallower near the San Andreas Fault.

Health and Historical Context

Historically, the Antelope Valley was developed primarily around alfalfa farming and the aerospace industry. Though agricultural activities on some of the parcels adjacent to SR-138 appear to fallow at different time periods, historic agricultural operations have occurred within a significant portion of the proposed ROWs of the Build Alternatives based on review of the earliest aerial photographs (1954) through the latest aerial photograph (2002). The agricultural operations appeared in the vicinity of 240th Street West and extending eastward for the length of the proposed project limits. Since the 1950s, agricultural operations have diminished appear to be the predominant land use into the early 2000s. The area within the RSA is predominantly vacant, undeveloped desert and agricultural land. Intermittent residential properties are located adjacent to the current SR-138 ROW alignment. Observed improvements within the proposed ROW include aboveground utilities (electrical transmission lines), underground utilities (natural gas, sewer, cable, phone, water, traffic boxes, oil pipelines, fiber optic lines), residential properties, agricultural (current and former) properties, gas station/market, market/restaurant, small businesses, concrete drainage channels, concrete irrigation diverters, and aboveground utility boxes and pole-mounted transformers.

Reasonably Foreseeable Actions and Their Impacts

Reasonably foreseeable actions include construction activities that could potentially increase the hazardous materials in the RSA from construction activities associated with the North Los Angeles/Kern County Regional Recycle Water Project. Also, maintenance activities during operation of the AV Solar Ranch One Project could uncover soils impacted by hazardous materials associated with past agricultural uses, and oil development. Impacts as a result of the California High Speed Train System were determined to be less than significant through design refinement at the project level as well as the use of best practices to avoid potential impacts during construction.

For the proposed project, project-specific impacts related to hazardous waste/materials would be avoided, minimized and mitigated through conformance with applicable regulatory requirements and implementation of the measures discussed below. Also, standard BMPs would be incorporated into the project to comply with the Caltrans and County's NPDES Permits, specifically WQ-7. Similar requirements would be required of other of cumulative projects within the RSA. All other cumulative projects would implement avoidance, minimization and/or mitigation measures that would reduce impacts related to hazardous waste/materials. As a result, cumulatively considerable impacts related to the increased exposure of people to public health and safety risks from hazardous materials would not occur.

Avoidance, Minimization, and/ or Mitigation Measures

HW-1: Additional field inspections/reconnaissance to identify environmental concerns would be required. The following investigations would be implemented:

- Site investigations (soil sampling);
- ADL investigation; and
- ACM/LBP surveys: Although ACM/LBP would be avoided to the extent practicable, there are approximately 7 structures, 195,000 linear feet of striping removal, and 22,500 linear feet of underground utilities that would require surveys and investigation. $50,000 should be allotted to perform the investigations.
- Treated Wood Waste (TWW): $210,000 should be allotted for the investigations and removal of approximately 1,400 tons of material.

HW-2: As part of the project design, a Soil Management Plan would be developed and implemented to ensure that soil excavated during construction that is impacted by metals, petroleum hydrocarbons, and/or pesticides is handled, stockpiled, and disposed of in accordance with federal, State, and local regulations. Reuse of ADL-impacted soils within the project footprint would be in accordance with the California Department of Toxic Substances and Control ADL Agreement for reuse within Caltrans ROW. Approximately $200-$300/ton of excavated (impacted) soil shall be allocated.

HW-3: Prepare a Construction Contingency Plan (CCP) in accordance with Caltrans' Unknown Hazards Procedures for Construction. The CCP would include provisions for emergency response in the event that unidentified USTs, hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes are discovered during construction activities. The CCP would also address UST decommissioning, field screening, contaminant materials testing methods, mitigation and contaminant management requirements, and health and safety requirements for construction workers. Approximately $200-$300/ton of excavated (impacted) soil shall be allocated for this project.

HW-4: If dewatering is required, conduct a groundwater evaluation to assess disposal alternatives and to comply with the requirements of the National Pollutant Discharge Elimination System (NPDES), during the preparation of Plans, Specifications, and Estimates (PS&E). Whenever possible, adjust the alignment to avoid areas of contaminated groundwater. To avoid or minimize exposure to contaminated groundwater, containerize, sample, and/or treat groundwater for disposal, discharge into the stormdrain system through an NPDES permit, or dispose in a recycling facility. Approximately $2-$3/ gallon needs to be allocated for dewatering purposes.

HW-5: Prior to the completion of full or partial acquisition of properties that have not been fully assessed, conduct additional site investigations to identify RECs. As required by Caltrans policy, properties identified as having RECs would not be acquired until characterization is complete and closure is achieved to ensure that all properties acquired are free of hazardous wastes/materials. Approximately $50,000-$75,000 needs to be allocated for additional investigation for each acquired property.

HW-6: Farm USTs were not regulated historically. As such, there is potential to encounter USTs/ASTs during construction on ranches and farming properties within the study area. Therefore, sample below USTs/ASTs, piping and dispensers for TPH, VOCs and metals at ranches with farming operations.

Approximately $20,000-$30,000 needs to be allocated for additional investigations for each farmland with USTs/ASTs.

HW-7: Remove and sample under commercial/industrial treatment systems for petroleum, TPH, VOCs, PCBs, and metals.

3.2.6 AIR QUALITY

Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency (U.S. EPA) and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional—or planning and programming—level and the project level. The project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (CFR) Part 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), sulfur dioxide (SO_2). California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP, and 4 years for the FTIP. RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and a "hot-spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide (CO) and/or particulate matter (PM_{10} or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measures a violation of the relevant standard and the U.S. EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially re-designated to attainment by the U.S. EPA, and are then called "maintenance" areas. "Hot-spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot-spot analysis. In general, projects must not cause the "hot-spot"-related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

Existing data sources used to prepare this section were taken from the Northwest 138 Corridor Improvement Project Air Quality Analysis (February 2017) for the project. Detailed analysis methodology, modeling files, and calculation worksheets can be found in the Air Quality Analysis.

The western portion of the project is located within the South Coast Air Basin, whereas the eastern portion is located within the Mojave Desert Air Basin. The portion of the project in the South Coast Air Basin is in an area that is nonattainment for federal PM2.5 (particulate matter less than 2.5 microns in size) and ozone 8-hour and in attainment/maintenance for federal CO (carbon monoxide), PM10 (particulate matter less than 10 microns in size)standards. The project in the Mojave Desert Air Basin is in an area that is attainment for the federal CO, PM2.5 and PM10 standards but nonattainment for ozone 8-hour. The conformity analysis focuses on these criteria pollutants for which the areas is in maintenance and nonattainment. Analyses in the technical study also address requirements for mobile source air toxic, other toxic air contaminants or hazardous air pollutants, and greenhouse gases.

South Coast Air Basin (SCAB) Climate Conditions

Climate in the SCAB is determined by its terrain and geographical location. The SCAB is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the SCAB. The region lies in the semi-permanent high-pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature in the SCAB ranges from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site monitoring temperature is the Fairmont Station. The annual average maximum temperature recorded at this station is 70.9°F, and the annual average minimum is 49.9°F. January is typically the coldest month in this area of the SCAB.

The majority of annual rainfall in the SCAB occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the SCAB along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the Fairmont Station. Average rainfall measured at this station varied from 3.52 inches in February to 0.49 inch or less between May and October, with an average annual total of 15.76 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The SCAB experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas in Los Angeles and Orange Counties are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are CO and oxides of nitrogen (NO_X) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO_X to form photochemical smog.

Mojave Desert Air Basin (MDAB) Climate Conditions

The Antelope Valley area, together with the Mojave Desert area in San Bernardino County, makes up the vast majority of the MDAB. The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains that dot the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB.

The MDAB is separated from the Southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered to the northwest by the Tehachapi Mountains and separated from the Sierra Nevadas in the north by the Tehachapi Pass (3,800 feet elevation). The Antelope Valley is bordered to the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet).

During the summer, the MDAB is generally influenced by a Pacific subtropical high cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert.

Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate that at least three months have maximum average temperatures over 100.4°F.

Attainment Status
Criteria pollutants are defined as those pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health and prevent degradation of the environment. The standards for these pollutants are shown in Table 75.

Local Ambient Air Quality
Historical air quality data show that existing carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either the state or federal ambient air quality standards. The project would help to improve traffic flow and reduce congestion on roadway links in the project vicinity. The project is located in an attainment/maintenance area for federal CO standards. Using the California Department of Transportation (Caltrans) Transportation Project-Level Carbon Monoxide Protocol, a screening CO hot-spot analysis was conducted to determine whether the project would result in any CO hot spots. It was determined that the project would not result in any exceedances of the 1-hour or 8-hour CO standards.

Table 75: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status	MDAB Attainment Status
Ozone (O_3)	1 hour 8 hours	0.09 ppm 0.070 ppm	---[4] 0.070 ppm[4] (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NO_X) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.	Federal: Extreme Nonattainment (8-hour) State: Nonattainment (1-hour and 8-hour)	Federal: Severe Nonattainment (8-hour) State: Nonattainment (1-hour and 8-hour)
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm[8] 6 ppm	35 ppm 9 ppm ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone. Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: Attainment/ Maintenance State: Attainment	Federal: Attainment State: Attainment
Respirable Particulate Matter (PM_{10})[2]	24 hours Annual	50 μg/m³ 20 μg/m³	150 μg/m³ ---[2] (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Federal: Attainment/Maintenance State: Nonattainment	Federal: Unclassified/Attainment State: Unclassified/Attainment
Fine Particulate Matter ($PM_{2.5}$)[2]	24 hours Annual 24 hours (conformity process[5]) Secondary Standard (annual; also for conformity process[2])	--- 12 μg/m³ --- ---	35 μg/m³ 12.0 μg/m³ 65 μg/m³ 15 μg/m³ (98th percentile over3 years)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NO_X, sulfur oxides (SO_X), ammonia, and ROG.	Federal: Moderate Nonattainment State: Nonattainment	Federal: Unclassified/Attainment State: Unclassified/Attainment

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status	MDAB Attainment Status
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm[6] (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of stormwater. Part of the "NO_X" group of ozone precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.	Federal: Attainment/ Maintenance State: Nonattainment	Federal: Unclassified/Attainment State: Attainment
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours Annual Arithmetic Mean	0.25 ppm --- 0.04 ppm ---	0.075 ppm[7] (99th percentile over 3 years) 0.5 ppm[9] 0.14 ppm 0.03 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified	Federal: Unclassified State: Attainment
Lead (Pb)[3]	Monthly Calendar Quarter Rolling 3-month average	1.5 $\mu g/m^3$ --- ---	--- 1.5 $\mu g/m^3$ 0.15 $\mu g/m^3$ [10]	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.	Federal: Nonattainment (Los Angeles County only) State: Nonattainment (Los Angeles County only)	Federal: Unclassified/Attainment State: Attainment
Sulfate	24 hours	25 $\mu g/m^3$	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Federal: N/A State: Attainment/ Unclassified	Federal: N/A State: Attainment
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Federal: N/A State: Attainment/ Unclassified	Federal: N/A State: Unclassified
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70 percent	---	Reduces visibility. Produces haze. NOTE: not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.	Federal: N/A State: Attainment/ Unclassified	Federal: N/A State: Unclassified

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	SCAB Attainment Status	MDAB Attainment Status
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	Federal: N/A State: Attainment/ Unclassified	Federal: N/A State: Attainment/ Unclassified

Source 1: California Air Resources Board (ARB). Website: www.arb.ca.gov/research/aaqs/aaqs2.pdf (October 2016).

Source 2: ARB, Area Designations. Website: http://www.arb.ca.gov/desig/desig.htm (accessed December 2016).

2 Annual PM_{10} NAAQS revoked October 2006; was 50 $\mu g/m^3$. 24-hour. $PM_{2.5}$ NAAQS tightened October 2006; was 65 $\mu g/m^3$. Annual $PM_{2.5}$ NAAQS tightened from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ December 2012, and secondary annual standard set at 15 $\mu g/m^3$.

3 The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the ARB and the EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for substantial health effects due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

4 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 ppm to 0.070 ppm.

5 The 65 $\mu g/m^3$ $PM_{2.5}$ (24-hr) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. The 15 $\mu g/m^3$ annual $PM_{2.5}$ standard was not revoked when the 12 $\mu g/m^3$ standard was promulgated in 2012. The 0.08 ppm 1997 ozone standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (7/20/2013). Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with a emission budget, EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the "Interim" period prior to availability of emission budgets, conformity tests may include some combination of build vs. no build, build vs. baseline, or compliance with prior emission budgets for the same pollutant.

6 Final 1-hour NO_2 NAAQS published in the Federal Register on February 9, 2010, effective March 9, 2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause redesignation to nonattainment in some areas after 2016.

7 The EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010. Nonattainment areas have not yet been designated as of September 2012.

8 State standards are "not to exceed" or "not to be equaled or exceeded" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as described above.

9 Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis addresses both primary and secondary NAAQS.

10 Lead NAAQS are not considered in Transportation Conformity analysis.

$\mu g/m^3$ = micrograms per cubic meter
ARB = California Air Resources Board
EPA = United States Environmental Protection Agency
MDAB = Mojave Desert Air Basin
NAAQS = national ambient air quality standards
ppb = parts per billion
ppm = parts per million
SCAB = South Coast Air Basin
SIP = State Implementation Plan

Long-term Regional Vehicle Emissions

The purpose of the proposed action is to accommodate projected short- and long-term growth, and associated increases in travel and goods movement, within northwest Los Angeles County. However, there is a possibility that some traffic currently utilizing other routes would use the new facilities, thus resulting in increased VMT within the project area. Therefore, the potential impact of the proposed project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from EMFAC2014.

The regional vehicle miles traveled (VMT) for the existing, No Build, and each of the three build alternatives was estimated using the daily traffic volumes included in the Transportation Analysis Report (Fehr and Peers, August 2015). The VMT calculations include the SR-138 corridor between I-5 on the west and SR-14 on the east, I-5 north and south of SR-138, and SR-14 north and south of SR-138. These roadway segments represent areas where the traffic volumes would be affected by the proposed project alternatives. The VMT data, along with the EMFAC2014 emission rates, were used to calculate the CO, ROGs, NO_X, PM_{10}, and $PM_{2.5}$ emissions for the Existing (2012), 2020, 2025, and 2040 conditions. Alternatives 1 and 2 have early implementation safety and operational improvements consistent with the elements identified in the TSM Alternative. Therefore, the emissions listed in Table 77 for the TSM Alternative are also representative of the emissions generated by the early implementation improvements of Alternatives 1 and 2.

Mobile Sources Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the CAA Amendments of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Volume 73, No. 201, page 61,358, October 16, 2008) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System. In addition, the EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA). These are acrolein, benzene, 1,3-butadiene, acetaldehyde, diesel particulate matter (Diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. While the FHWA considers these the priority mobile source air toxics (MSAT), the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2008 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines.

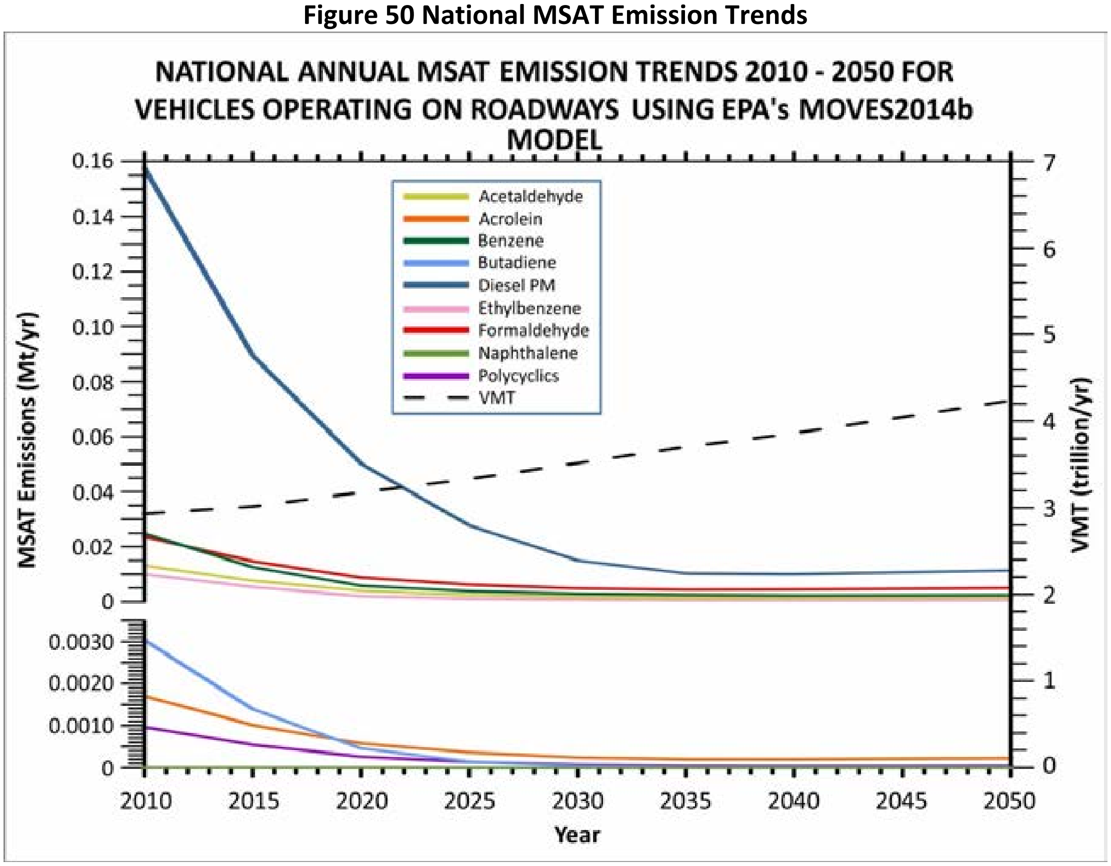
Based on an FHWA analysis using EPA’s MOVES2014b Model, as shown in Figure 50, even if VMT increases by 45 percent as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period. The projected reduction in MSAT emissions would be slightly different in California due to the use of the EMFAC emission model in place of the MOVES model.

Emissions factors for each of the MSATs were obtained for the project area using emission rates generated by EMFAC2014 and the VMT associated with each of the project alternatives. Results of the analyses are tabulated in for the existing (2012), 2020, 2025, and 2040 conditions. Alternatives 1 and 2 have early implementation safety and operational improvements.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA).

Nonetheless, air toxics concerns continue to be raised regarding highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, the EPA, the Health Effects Institute, and others have funded and conducted research studies in order to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

Figure 50 National MSAT Emission Trends



Source: Caltrans, Air Quality Analysis, February 2017

NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. NEPA requires, and FHWA is committed to, the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulations at 23 CFR Part 771.

On October 18, 2016, the FHWA issued guidance to advise FHWA division offices as to when and how to analyze MSATs in the NEPA process for highways. This document is an update to the guidance released in February 2006, September 2009, and December 2012. The guidance is described as interim because MSAT science is still evolving. As the science progresses, FHWA will update the guidance. This analysis follows the FHWA guidance.

Information that is Unavailable or Incomplete

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. It is the lead authority for administering the CAA and its amendments and has specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. It maintains the Integrated Risk Information System, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects." Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute. Two Health Effects Institute studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious are the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts; each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by the Health Effects Institute. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA and the Health Effects Institute have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the EPA to determine a “safe” or “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the United States Court of Appeals for the District of Columbia Circuit upheld the EPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against project benefits such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, which are better suited for quantitative analysis.

Naturally Occurring Asbestos
Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types, such as tremolite and actinolite, are also found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a TAC by ARB in 1986. All types of asbestos are hazardous and may cause lung disease and cancer.

Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals.

Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties of the Sierra Nevada foothills, the Klamath Mountains, and Coast Ranges. The California Department of Conservation, Division of Mines and Geology have developed a map of the state showing the general location of ultramafic rock in the state. Los Angeles County is one of the counties identified as containing serpentinite and ultramafic rock. However, only the Catalina Island portion of Los Angeles County has been found to contain such rock; therefore, it is not anticipated to be found in the project area.

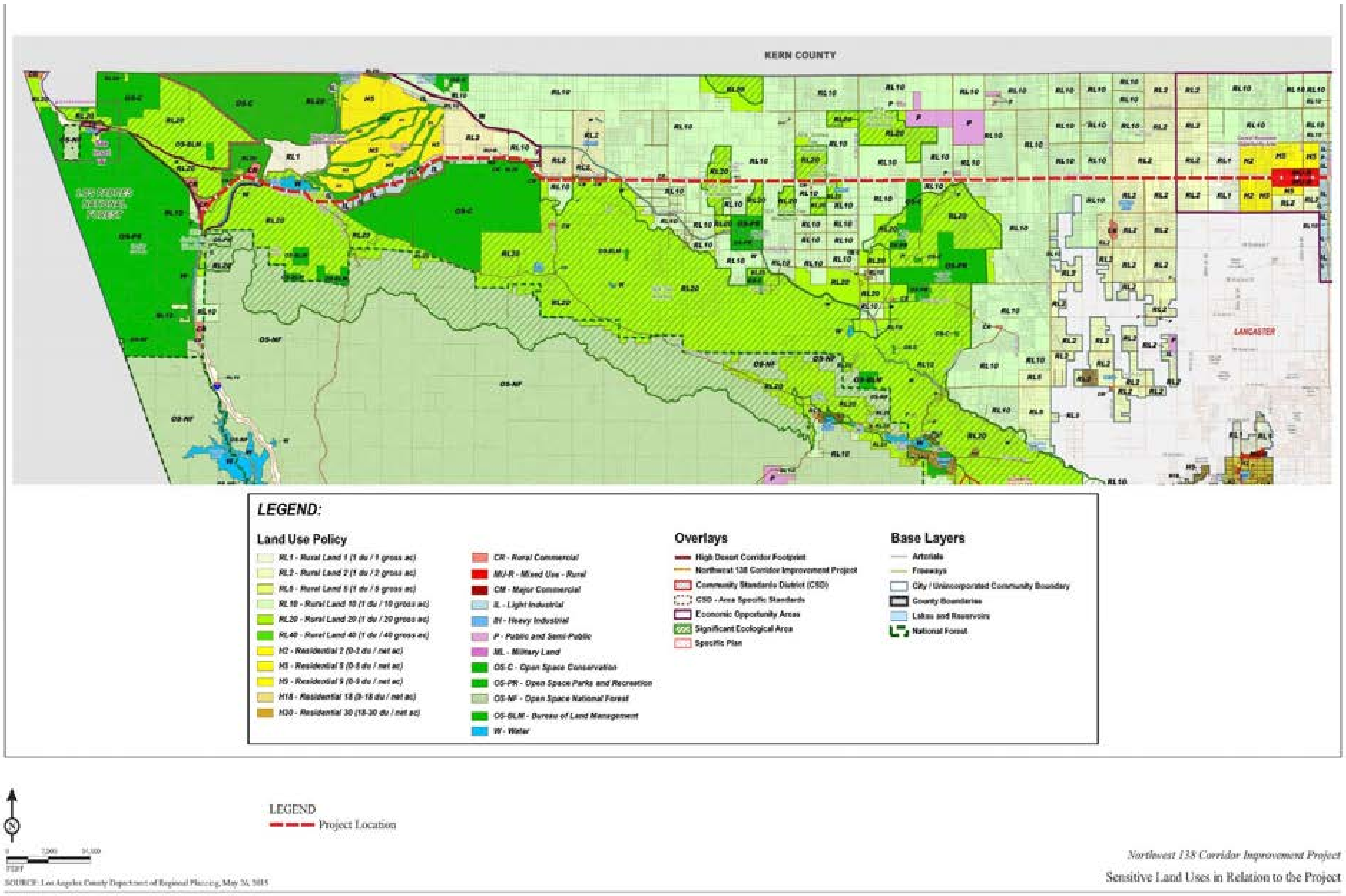
Other Asbestos Containing Materials

The use of asbestos in many building products was banned by EPA by the late 1970s. Those already in use when the ban was implemented may still be present in bridge joints or in structural materials. ACMs represent a concern when they are subject to damage that results in the release of fibers. Asbestos may be found in roadway materials such as rails, bearing pads, support piers, expansion joint material in bridges, asphalt, and concrete within the study area.

Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes (see Figure 51). Land uses within the project area include residential, agriculture, office, utility, and vacant land. The majority of the sensitive receptors within or adjacent to the project area are residential uses.

Figure 51 Sensitive Land Uses



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Environmental Consequences

This section discusses long-term impacts on air quality in terms of regional air quality conformity and project-level conformity. Temporary impacts associated with construction of the project are addressed in the Construction (Short-term Impacts) section below.

<u>*No Build Alternative*</u>

Implementation of the No-Build Alternative would maintain the existing configuration of SR-138 and would not result in improvements to SR-138. This alternative would potentially be inconsistent with regional plans and programs such as the 2016 RTP/SCS and 2017 FTIP since the project would not be constructed as approved in the Regional Transportation Plan for the area. The No-Build Alternative provides a baseline for comparing the impacts associated with the Build Alternatives.

<u>*Build Alternatives (Alternative 1 and Alternative 2)*</u>

Regional Conformity

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO2, O3, PM10, and PM2.5, and in some areas (although not in California), SO2. California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO2. Regional conformity is based on emission analysis of RTPs and FTIPs that include all transportation projects planned for a region over a period of at least 20 years for the RTP, and 4 years for the FTIP. RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the MPO, the FHWA, and the FTA make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the project meets regional conformity requirements for the purposes of project-level analysis.

The project is in the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016 (RTP ID: 1122004; *Northwest 138 Corridor Improvement Project – approximately 36 miles, providing an improved 4 to 6 lane facility between I-5 and SR 14*). The project is also in the 2017 Federal Transportation Improvement Program (FTIP), which was found to be conforming by the FHWA/FTA on December 16, 2016 (Project ID: LA0G949*; Complete PA&ED to determine the alternatives for the approximate 36.8-mile east-west SR-138 highway facility between I-5 and SR-14 in northern Los Angeles County. The PA&ED will study and determine the alternatives (i.e., freeway and/or expressway), constraints (right-of-way requirements), potential impacts/improvements and conduct technical studies)*.

The project is consistent with the FTIP scope of design concept, and in conformance with the State Implementation Plan (SIP). The project would also comply with all SCAQMD. As part of the Clean Air Rules of 2004, the EPA published a final rule in the Federal Register on July 1, 2004, to amend the Transportation Conformity Rule to include criteria and procedures for the new 8-hour O3 and PM2.5 NAAQS. The final rule addressed a March 2, 1999, court decision by incorporating the EPA and USDOT guidance. On July 20, 2004, the EPA published a technical correction notice to correct two minor errors in the July 1, 2004, notice. To remain consistent with the stricter federal standards, the ARB approved a new 8-hour O3 standard (0.07 parts per million [ppm], not to be exceeded) for O3 on April 28, 2005.

Additionally, the ARB retained the current 1-hour-average standard for O3 (0.09 ppm) and the current monitoring method for O3, which uses the ultraviolet (UV) photometry method. Therefore, the project would not result in adverse impacts related to regional conformity.

Project-Level Conformity

Historical air quality data show that existing carbon monoxide (CO) levels for the project area and the general vicinity do not exceed either the state or federal ambient air quality standards. The project would help to improve traffic flow and reduce congestion on roadway links in the project vicinity. The project is located in an attainment/maintenance area for federal CO standards. Using the California Department of Transportation (Caltrans) Transportation Project-Level Carbon Monoxide Protocol, a screening CO hot-spot analysis was conducted to determine whether the project would result in any CO hot spots. It was determined that the project would not result in any exceedances of the 1-hour or 8-hour CO standards. Therefore, the project would not result in adverse impacts related to CO hot spots.

The Antelope Valley Air Quality Management District (AVAQMD) operates several air quality monitoring stations within the project area. The SCAQMD does not operate any air quality monitoring stations within the project area. The Lancaster Air Quality Monitoring Station, located at 43301 Division Street, monitors four of the five criteria for pollutants: CO, 03, NO2 and PM. The closest monitoring station with S02 data is the Victorville Station in San Bernardino County. Figure 52 shows the locations of the monitoring stations relative to the project area and Table 76 shows the Lancaster Station Air Quality Levels.

An Air Quality Conformity Analysis was prepared and submitted to FHWA on January 2, 2017 to request project-level conformity determination. Caltrans is not allowed to approve the Final EIR/EIS without the determination by FHWA. Following their review, FHWA provided their project-level conformity determination for the project on February 14, 2017. Appendix L provides a copy of the project-level conformity determination by FHWA.

Results from Carbon Monoxide Hot-Spot Analysis Common to all Build Alternatives

The methodology required for a CO local analysis is summarized in the Caltrans Transportation Project-Level Carbon Monoxide Protocol (Protocol), Section 3 (Determination of Project Requirements) and Section 4 (Local Analysis). In Section 3, the Protocol provides two conformity requirement decision flowcharts that are designed to assist the project sponsors in evaluating the requirements that apply to specific projects. The flowchart in Figure 53 of the Protocol applies to new projects and was used in this local analysis conformity decision. The project is not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, a detailed CALINE4 CO hot-spot analysis is not required.

Figure 52 Air Quality Monitoring Stations in the Project Vicinity

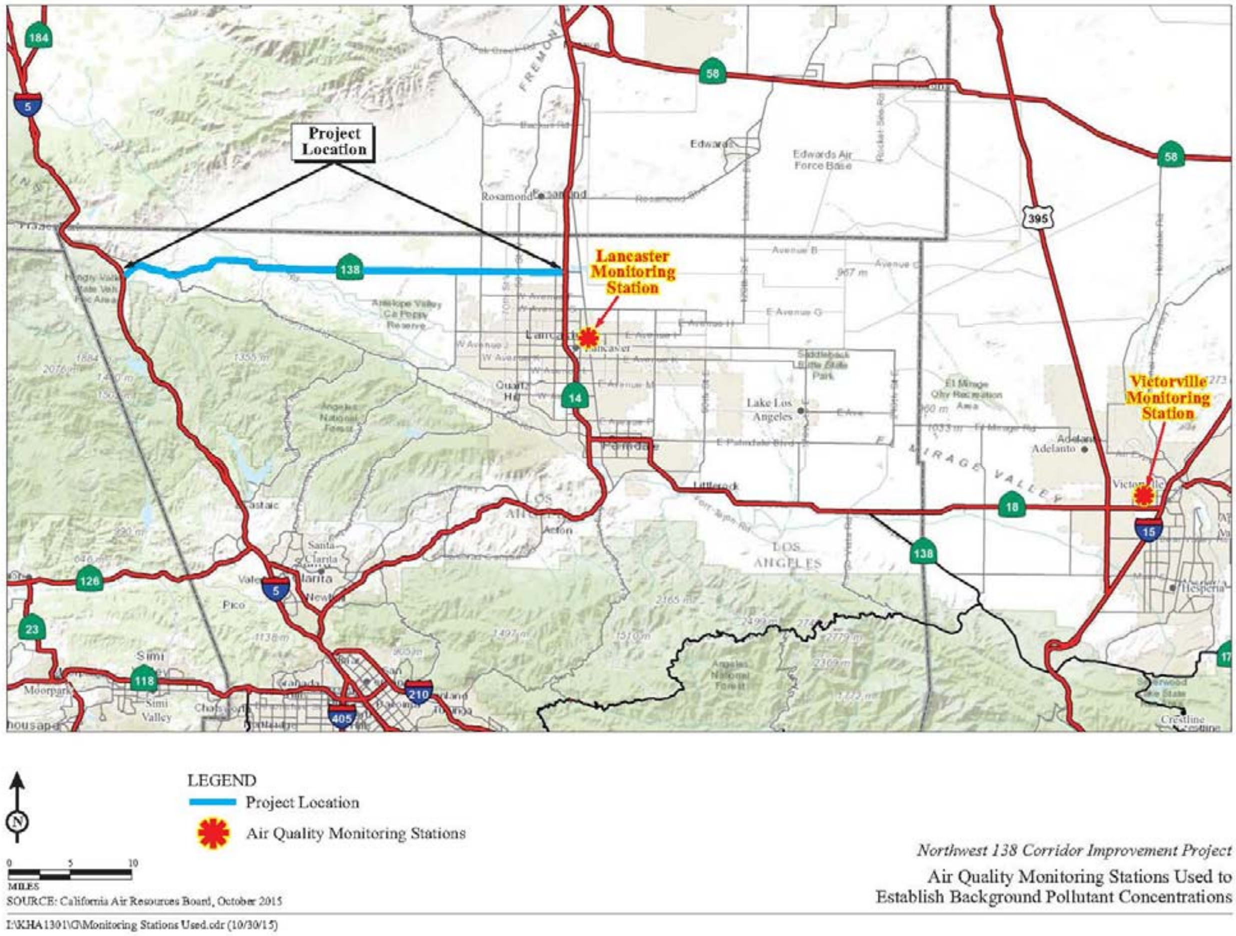
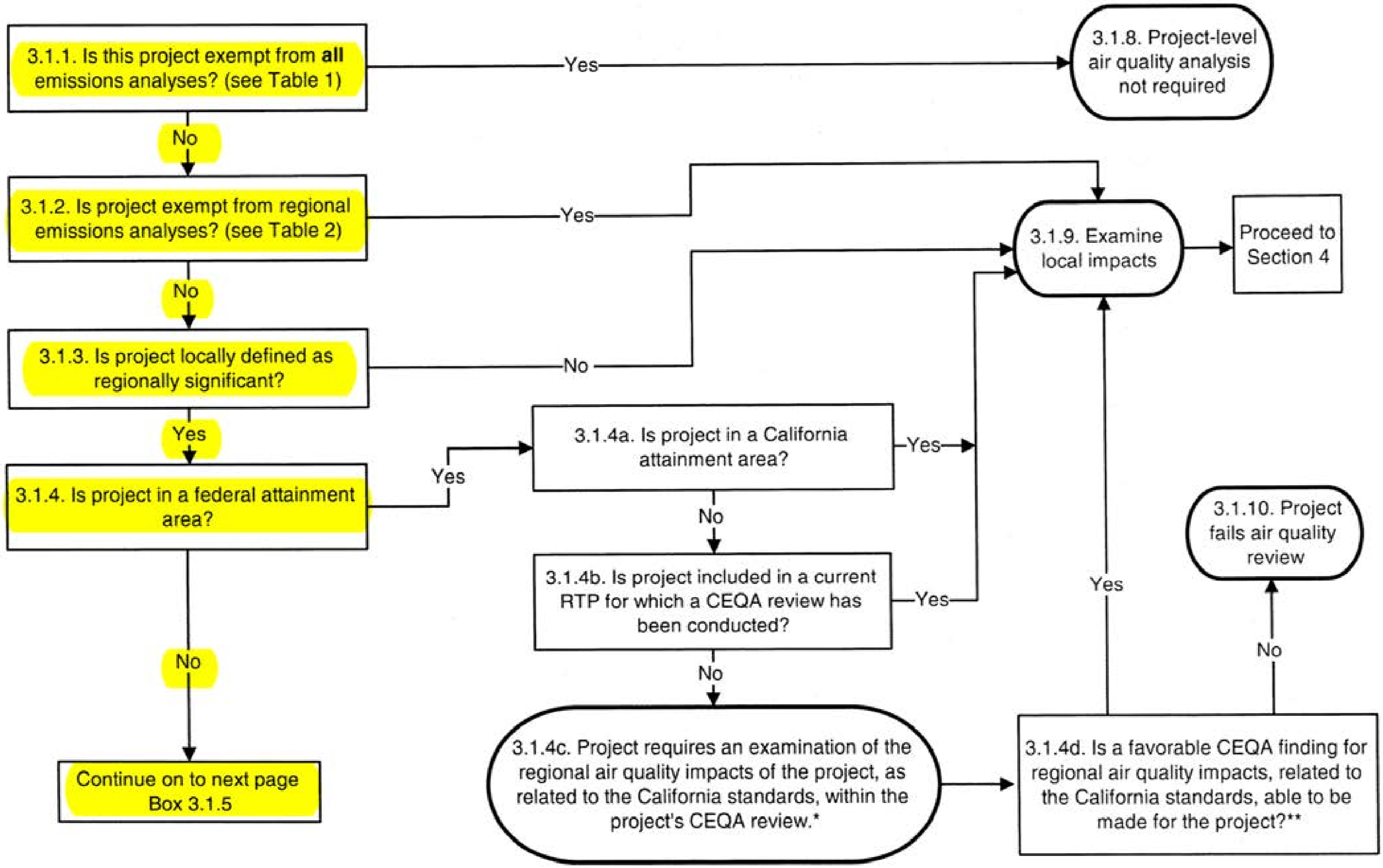


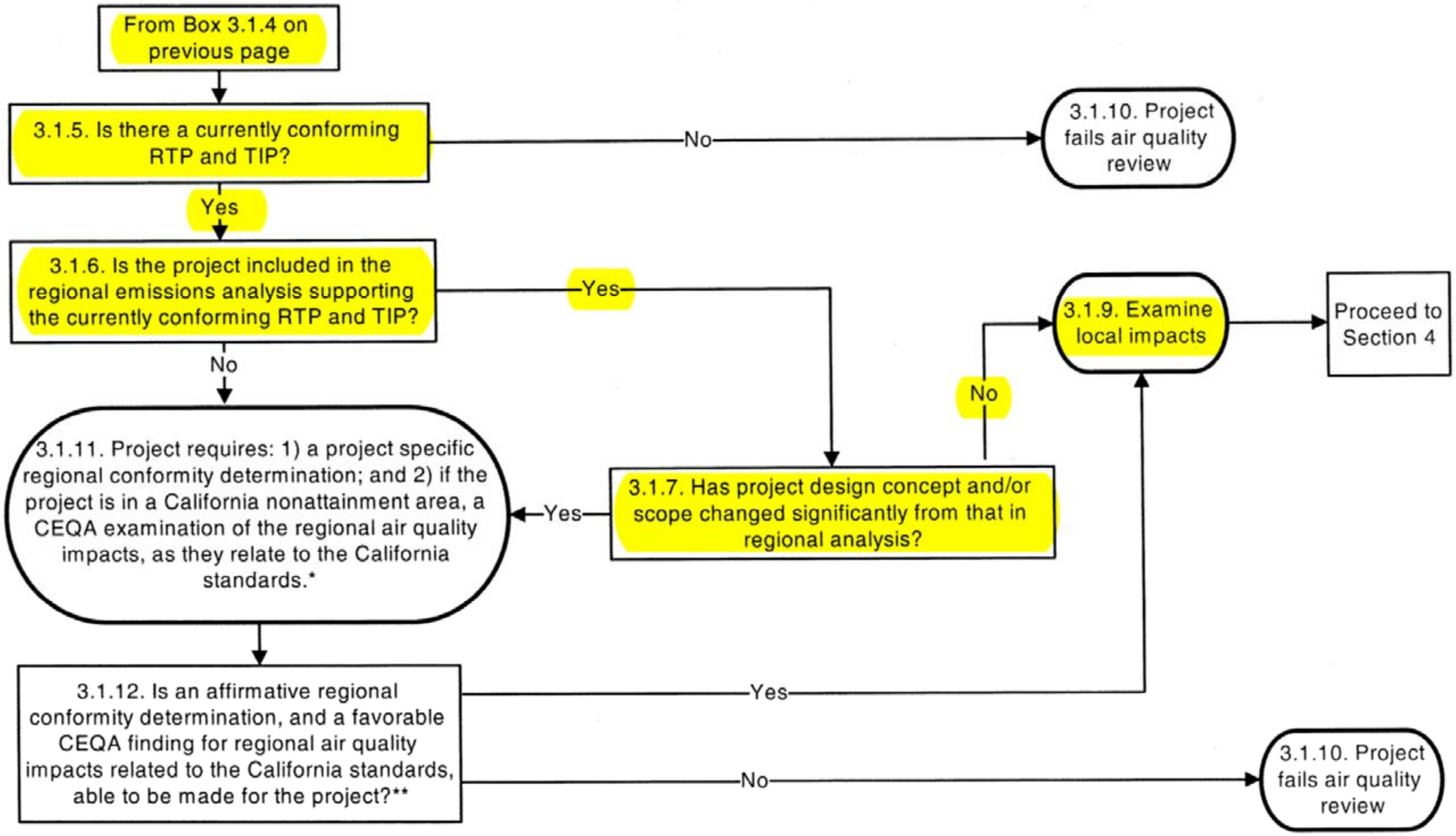
Table 76 Lancaster Station Air Quality Levels

Pollutant	Standard	2010	2011	2012	2013	2014	2015
Carbon Monoxide							
Max 1-hr concentration (ppm)		1.8	2.3	1.9	1.9	15.2	1.5
No. days exceeded: State Federal	> 20 ppm/1-hr > 35 ppm/1-hr	0 0	0 0	0 0	0 0	0 0	0 0
Max 8-hr concentration (ppm)		1.23	1.33	1.4	1.2	10.6	1.3
No. days exceeded: State Federal	>9.1 ppm/8-hr >9.5 ppm/8-hr	0 0	0 0	0 0	0 0	5 5	0 0
Ozone							
Max 1-hr concentration (ppm)		0.107	0.115	0.112	0.108	0.101	0.132
No. days exceeded: State	> 0.09 ppm/1-hr	11	19	13	9	3	26
Ozone							
Max 8-hr concentration (ppm)		0.096	0.100	0.095	0.094	0.088	0.103
No. days exceeded: State Federal	> 0.07 ppm/8-hr > 0.075 ppm/8-hr	78 45	76 53	72 39	53 34	36 17	82 53
Particulate matter less than 10 microns in size (PM_{10})							
Max 24-hr concentration (μg/m^3)		43.6	81.9	47.0	47.9	131.5	112.8
No. days exceeded: State Federal	> 50 μg/m^3 > 150 μg/m^3	1 0	0 0	0 0	2 0	NA 0	3 0
Annual avg. concentration (μg/m^3)		18.5	19.6	19.8	21.8	24.3	19.3
Exceeds Standard? State	> 20 μg/m^3	Yes	No	No	Yes	Yes	No
Particulate matter less than 2.5 microns in size ($PM_{2.5}$)							
Max 24-hr concentration (μg/m^3)		15.0	50.0	14.0	11.9	42.0	10.4
No. days exceeded: Federal	> 35 μg/m^3	0	1	0	0	1	0
Annual avg. concentration (μg/m^3)		6.0	7.0	5.5	5.8	7.2	5.2
Exceeds Standard? State Federal	> 12 μg/m^3 > 15 μg/m^3	No No	No No	No No	No No	No No	No No
Nitrogen Dioxide							
Max 1-hr concentration (ppm): State	> 0.18 ppm/1-hr	0.056	0.058	0.049	0.047	0.051	0.042
No. days exceeded		0	0	0	0	0	0
Annual avg. concentration: Federal	0.053 ppm annual avg.	0.056	0.058	0.049	0.047	0.051	0.007
No. days exceeded		0	0	0	0	0	0
*Sulfur Dioxide**							
Max 24-hr concentration (ppm)		0.007	0.007	0.003	0.002	0.019	0.018
No. days exceeded: State Federal	0.04 ppm 0.14 ppm	NA NA	NA NA	0 0	0 0	0 0	00
Annual avg. concentration: Federal	0.030 ppm annual avg.	0.000	0.001	NA	0.000	0.001	0.004
Exceed Federal standard?		No	No	No	No	No	No

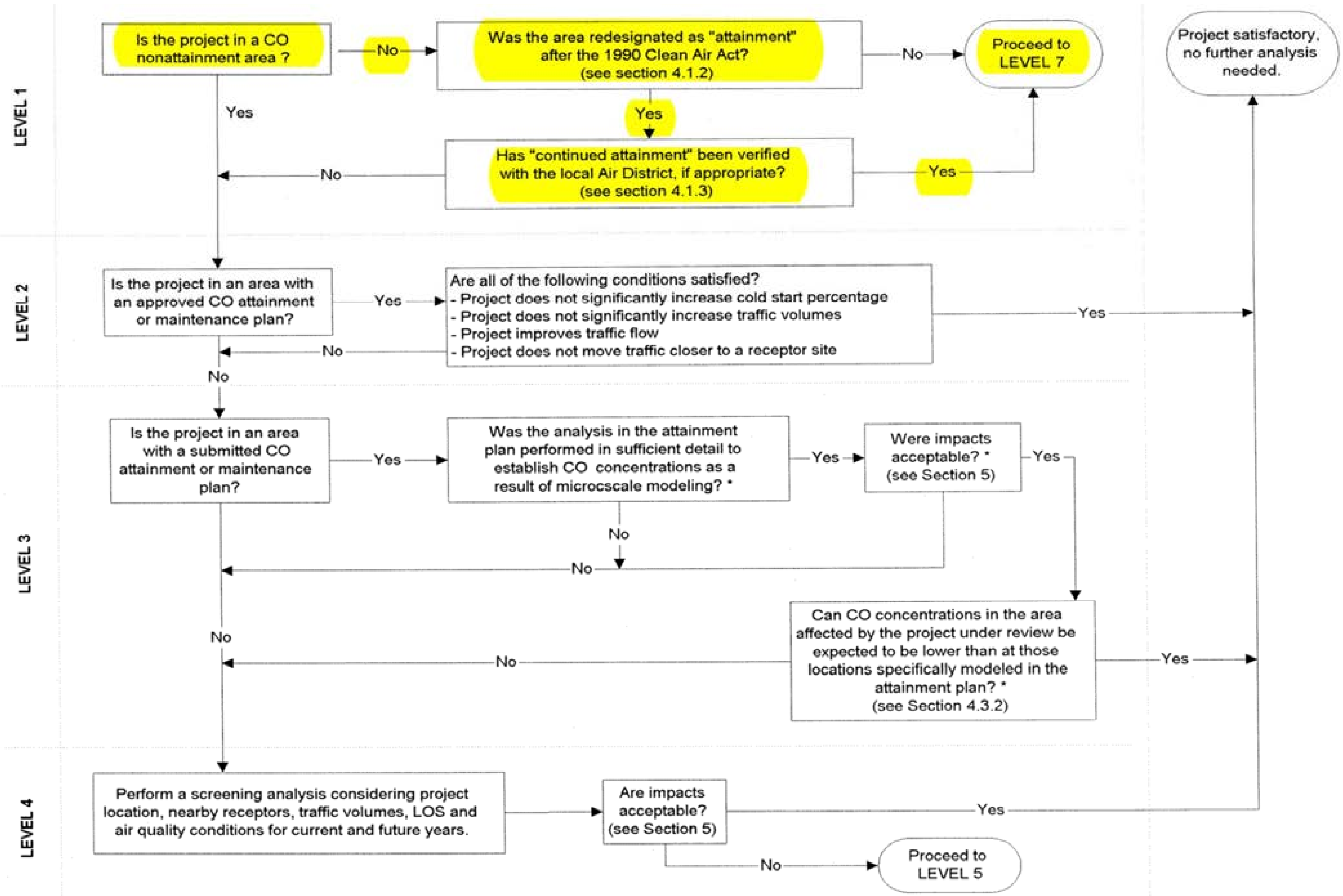
Source: U.S. Environmental Protection Agency and California Air Resources Board, 2010 to 2015.
* SO_2 data are obtained from the Victorville Monitoring Station in San Bernardino County, California.
μg/m^3 = micrograms per cubic meter
NA = Not Available
ppm = parts per million

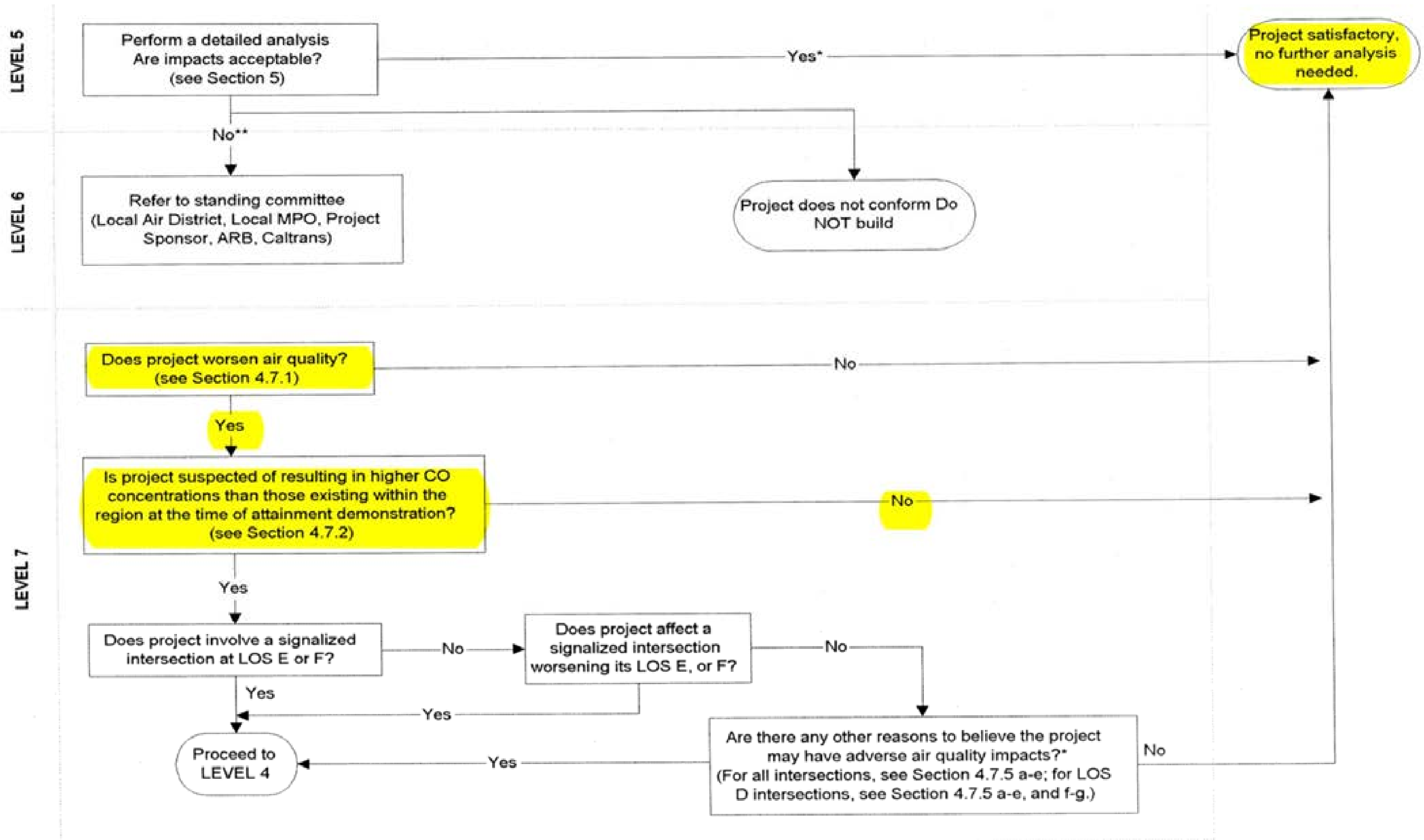
Figure 53 Project-Level Carbon Monoxide Protocol





*In consultation w/MPO and Caltrans
**In consultation w/MPO, local air district, CARB and Caltrans


LEVEL 1
Is the project in a CO nonattainment area ?
No
Was the area redesignated as "attainment" after the 1990 Clean Air Act? (see section 4.1.2)
No
Proceed to LEVEL 7
Project satisfactory, no further analysis needed.
Yes
Yes
Has "continued attainment" been verified with the local Air District, if appropriate? (see section 4.1.3)
No
Yes
LEVEL 2
Is the project in an area with an approved CO attainment or maintenance plan?
Yes
Are all of the following conditions satisfied?
- Project does not significantly increase cold start percentage
- Project does not significantly increase traffic volumes
- Project improves traffic flow
- Project does not move traffic closer to a receptor site
Yes
No
No
LEVEL 3
Is the project in an area with a submitted CO attainment or maintenance plan?
Yes
Was the analysis in the attainment plan performed in sufficient detail to establish CO concentrations as a result of microcscale modeling? *
Yes
Were impacts acceptable? * (see Section 5)
Yes
No
No
No
Can CO concentrations in the area affected by the project under review be expected to be lower than at those locations specifically modeled in the attainment plan? * (see Section 4.3.2)
No
Yes
LEVEL 4
Perform a screening analysis considering project location, nearby receptors, traffic volumes, LOS and air quality conditions for current and future years.
Are impacts acceptable? (see Section 5)
Yes
No
Proceed to LEVEL 5



*Consultation with MPO and Local Air District required in addition to normal NEPA/CEQA requirements
**Consultation with MPO, Local Air District, CARB and Caltrans (District & Headquarters) required in addition to normal NEPA/CEQA requirements

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Particulate Matter Conformity Hot-Spot Analysis and Results from Modeling
The project is within a nonattainment area for federal PM2.5 and within an attainment/maintenance area for federal PM10 standards (SCAB portion only). Therefore, per 40 CFR, Part 93, analyses are required for conformity purposes. However, the EPA does not require hot-spot analyses, qualitative or quantitative, for projects that are not listed in Section 93.123(b)(1) as an air quality concern. The project does not qualify as a project of air quality concern (POAQC) because of the following reasons:

- The project would improve SR-138 either by changing the existing highway or changing existing regionally significant streets. Based on the Transportation Analysis Report (Fehr & Peers, June 2015), traffic volumes along SR-138 would not exceed the 125,000 average daily trips criteria for a POAQC. In addition, although the truck percentage exceeds 8 percent, the truck traffic volumes would not exceed the 10,000 daily trip criteria for POAQC. For I-5, traffic volumes would exceed the 125,000 average daily trip and 10,000 daily truck trip criteria for a POAQC. However, the change in truck traffic volumes would not exceed the 10,000 daily trip criteria for POAQC.

- The project does not affect intersections that are at Level of Service (LOS) D, E, or F with a significant number of diesel vehicles. Based on the Transportation Analysis Report (Fehr & Peers, June 2015), the project would reduce the delay and improve the LOS at intersections within the project vicinity. The LOS conditions in the project vicinity with and without the project are shown in Traffic and Transportation Analysis Report.

- The project does not include the construction of a new bus or rail terminal.

- The project does not expand an existing bus or rail terminal.

- The project is not in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

On December 2, 2014, the Transportation Conformity Working Group (TCWG) determined that the project is not a project of air quality concern. An updated PM hot-spot summary form was submitted to the TCWG for their review on July 28, 2015. Per the transportation conformity rules and regulations, all nonexempt projects must go through review by the TCWG. This project was approved and concurred upon by Interagency Consultation at the TCWG as of not air quality concern for PM10 and PM2.5; and that it meets the requirements of the CAA and 40 CFR 93.116 without any explicit hot-spot analysis.

The proposed Build Alternatives would not cause violations of the federal PM_{10} or $PM_{2.5}$ standards in the SCAB region. The MDAB region is currently designated as attainment/unclassified for the federal PM10 and PM2.5 standards. The SCAB region is in nonattainment of the State $PM_{2.5}$ and PM_{10} standards while the MDAB region is in nonattainment of the State PM10 standard only. The background PM_{10} concentrations currently exceed the State 24-hour and annual PM_{10} standards for both SCAB and MDAB regions. The increased emissions from either Build Alternative would likely worsen the current exceedance of the State PM_{10} standards in both SCAB and MDAB regions. The background annual $PM_{2.5}$ concentrations are much lower than the State standard. Thus the increased $PM_{2.5}$ emissions from either Build Alternative would worsen the background concentrations, but not cause violations of the State $PM_{2.5}$ standard in the SCAB and MDAB regions.

Interagency Consultation and public involvement requirements related to PM10 and PM2.5 have been completed in accordance with the *Transportation Conformity Guidance for Quantitative Hot-spot Analysis in PM2.5 and PM1O Nonattainment and Maintenance Areas* (U.S. EPA, November 2015). Interagency Consultation concluded on July 28, 2015. The Interagency Consultation partners concurred, as shown in the attached materials, that the project is not exempt from conformity analysis requirements, but that it is not a Project of Concern for PM10 and PM2.5 as defined at 40 CFR 93.123(b)(1). As such, an explicit, detailed PM10 and PM2.5 hot spot analysis is not required.
Public involvement included advertising the availability of the conformity analysis for 45 days beginning on August 5, 2016.

Long-Term Regional Vehicle Emission Impacts

Alternative 1 (Freeway/Expressway)
As shown in Table 77, with the exception of $PM_{2.5}$ and PM_{10}, Alternative 1 criteria pollutant emissions are lower than the existing condition emissions. The increased $PM_{2.5}$ and PM_{10} emissions are due to the increase in re-entrained dust emissions associated with the increased regional VMT. The 2020 Alternative 1 emissions are associated with the early implementation safety and operational improvements. All of the 2020 Alternative 1 criteria pollutant emissions are equal to the corresponding No Build Alternative emissions. All of the 2025 and 2040 Alternative 1 criteria pollutant emissions are higher than the corresponding No Build Alternative emissions. The largest project related increase in regional vehicle emissions are along SR-138, where the project would have the largest increase in VMT. There would be no traffic-related difference between Alternative 1 without and with the Antelope Acres community bypass design option. Thus, there would be no difference in the air quality impacts from this design option of Alternative 1.

Alternative 2 (Expressway/Limited Access Conventional Highway)
As shown in Table 77, with the exception of $PM_{2.5}$ and PM_{10}, Alternative 2 criteria pollutant emissions are lower than the existing condition emissions. The increased $PM_{2.5}$ and PM_{10} emissions are due to the increase in re-entrained dust emissions associated with the increased regional VMT. The 2020 Alternative 2 emissions are associated with the early implementation safety and operational improvements. All of the 2020 Alternative 2 criteria pollutant emissions are equal to the corresponding No Build Alternative emissions. All of the 2025 and 2040 Alternative 2 criteria pollutant emissions are higher than the corresponding No Build Alternative emissions. The largest project related increase in regional vehicle emissions are along SR-138, where the project would have the largest increase in VMT.

TSM Alternative
As shown in Table 77, with the exception of $PM_{2.5}$ and PM_{10}, the 2020 and 2040 TSM Alternative criteria pollutant emissions are lower than the existing condition emissions. The increased $PM_{2.5}$ and PM_{10} emissions are due to the increase in re-entrained dust emissions associated with the increased regional VMT. All of the 2020 and 2040 TSM Alternative criteria pollutant emissions are equal to the corresponding No Build Alternative emissions.

Table 77: 2020/2025 Opening Year and 2040 Horizon Year MSAT Emissions (lbs/day)

Alternative	2020 Opening Year					2025 Opening Year					2040 Horizon Year				
	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	PM_{10}	$PM_{2.5}$
2012 Existing	3,495	145	1,028	91	44	3,495	145	1,028	91	44	3,495	145	1,028	91	44
No Build Alternative	2,066	76	741	115	49	1,653	63	559	136	58	1,297	57	230	202	83
Change from Existing	*-1,429*	*-69*	*-286*	*24*	*6*	*-1,842*	*-82*	*-469*	*45*	*14*	*-2,198*	*-89*	*-798*	*111*	*39*
TSM Alternative	2,066	76	741	115	49	–	–	–	–	–	1,297	57	230	202	83
Change from Existing	*-1,429*	*-69*	*-286*	*24*	*6*	–	–	–	–	–	*-2,198*	*-89*	*-798*	*111*	*39*
Change from No Build	*0*	*0*	*0*	*0*	*0*	–	–	–	–	–	*0*	*0*	*0*	*0*	*0*
Alternative 1	2,066	76	741	115	49	2,393	92	809	198	83	2,169	95	384	337	138
Change from Existing	*-1,429*	*-69*	*-286*	*24*	*6*	*-1,101*	*-54*	*-219*	*107*	*40*	*-1,326*	*-50*	*-644*	*246*	*95*
Change from No Build	*0*	*0*	*0*	*0*	*0*	*741*	*28*	*250*	*61*	*26*	*872*	*38*	*154*	*136*	*56*
Alternative 2	2,066	76	741	115	49	2,331	89	788	192	81	2,094	92	371	326	133
Change from Existing	*-1,429*	*-69*	*-286*	*24*	*6*	*-1,164*	*-56*	*-240*	*101*	*38*	*-1,401*	*-54*	*-657*	*235*	*90*
Change from No Build	*0*	*0*	*0*	*0*	*0*	*678*	*26*	*229*	*56*	*24*	*797*	*35*	*141*	*124*	*51*
AVAQMD Thresholds	**548**	**137**	**137**	**82**	**82**	**548**	**137**	**137**	**82**	**82**	**548**	**137**	**137**	**82**	**82**
SCAQMD Thresholds	**550**	**55**	**55**	**150**	**55**	**550**	**55**	**55**	**150**	**55**	**550**	**55**	**55**	**150**	**55**

Source: LSA Associates, Inc. (May 2017) and CT-EMFAC, Version 6.
CO = carbon monoxide
CT-EMFAC = Caltrans Emissions Factors model
lbs/day = pounds per day
NO_X = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District
TSM = Transportation System Management

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Construction (Short-term Impacts)
During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NO_X, VOCs, directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. Construction-related effects on air quality from most roadway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, CO, SO_2, NO_X, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after drying. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of equipment operating at the time. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.
SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 ppm of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust would be minimal.

The maximum amount of construction-related emissions during a peak construction day is presented in Table 78**.** The PM10 and PM2.5 emissions assume a 50 percent control of fugitive dust as a result of watering and associated dust-control measures. The emissions presented below are based on the best information available at the time of calculations and specify that the schedule for Alternative 1 and 2 is anticipated to take approximately 53 months, beginning in April 2022 and ending in August 2026.

Compliance with Caltrans Standard Specifications Sections 10, 18, and 7-1.01F and the South Coast Air Quality Management District (SCAQMD) and Antelope Valley Air Quality Management District (AVAQMD) Rules and Regulations during construction would reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions.

Table 78: Maximum Project Construction Emissions Alternatives 1 and 2

Project Phases	ROG	CO	NO_X	Total PM_{10}	Total $PM_{2.5}$
Grubbing/Land Clearing (lbs/day)	15.8	113.8	96.3	104.2	24.5
Grading/Excavation (lbs/day)	23.1	179.0	169.3	108.2	27.5
Drainage/Utilities/Sub-Grade (lbs/day)	16.6	144.0	115.2	104.5	24.7
Paving (lbs/day)	4.8	42.8	32.3	1.1	1.0
Maximum (lbs/day)	23.1	179.0	169.3	108.2	27.5
Total (tons/construction project)	**10.1**	**81.5**	**71.4**	**52.7**	**13.0**

Source: LSA Associates, Inc. (August 2015).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gases

Construction
The schedule for all improvements is anticipated to take approximately 53 months, beginning in April 2022 and ending in August 2026. Therefore, construction activities would not last for more than five years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

Naturally Occurring Asbestos
The project is located in Los Angeles County, which is among the counties listed as containing serpentine and ultramafic rock. However, the portion of the County in which the project lies is not known to contain serpentine or ultramafic rock. Therefore, the impact from naturally occurring asbestos (NOA) during project construction would be minimal to none.

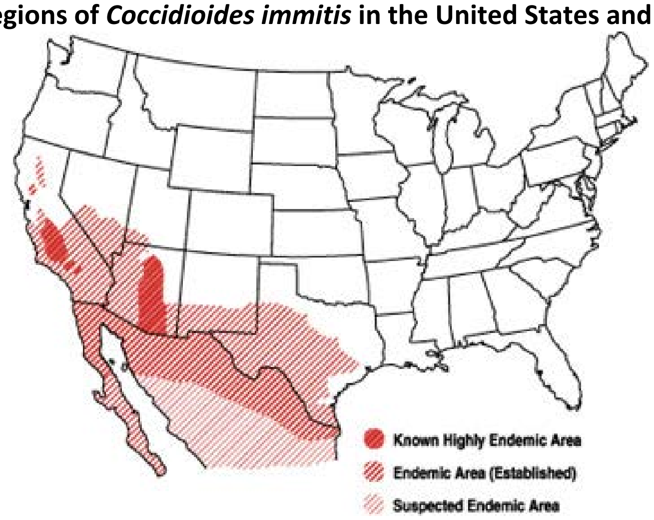
Lead (Pb) Lead is found in old paints and coatings, plumbing, and a variety of other materials. Once in the bloodstream, lead can cause damage to the brain, nervous system, and other body systems. Children are highly susceptible to the effects of lead. The Los Angeles County portion of the SCAB is in nonattainment for federal and State lead standards. The entire MDAB is in attainment for Federal and State lead standards.

Valley Fever

The Centers for Disease Control and Prevention (CDC) indicates that *Coccidioides immitis* is a fungus found in the soil of dry, low rainfall areas and is native and common in many areas of the southwestern United States, Mexico, and Central and South America. As shown below, the project is in an endemic area for *Coccidioides*. Coccidioidomycosis, also known as Valley Fever, is a common cause of pneumonia in the areas where *Coccidioides* occurs. *Coccidioides* spores circulate in the air after contaminated soil and dust are disturbed by such human or natural activities as winds, construction, farming, animal burrows, or burial. The spores are typically inhaled, although in rare cases spores can enter the skin through cuts or abrasions and cause infection. After the fungal spores are settled in the lungs, they change into a multicellular structure called a spherule. Fungal growth in the lungs occurs as the spherule grows and bursts, releasing endospores, which then develop into more spherules.

At least 30 to 60 percent of people who live in endemic areas such as the Antelope Valley region where the fungus is present are exposed to the fungus at some point during their lives. In most people, the infection will go away on its own, but for a small segment of the population, including people of Asian descent (particularly those of Filipino descent), African-American, pregnant women, and people with weakened immune systems; the risk for the disease is increased. It is difficult to avoid exposure to *Coccidioides*, but people who are at higher risk should try to avoid breathing in large amounts of dust if they are in endemic areas.

Figure 54 Endemic regions of *Coccidioides immitis* in the United States and northern Mexico



Source: USGS, 2000

Most people who are exposed to the fungus do not develop symptoms or have mild flu-like symptoms that go away on their own. In severe cases, patients develop pneumonia or meningitis which can sometimes lead to death. Meningitis, the most lethal complication of disseminated Valley Fever, may cause a stiff neck, severe and persistent headache, nausea, vomiting, and various other central nervous system symptoms such as disorientation, loss of balance or equilibrium, inability to think clearly, and loss of consciousness. In addition to humans, Valley Fever affects many species of domestic and wild animals. Because the spores of *Coccidioides immitis* can become airborne during soil disturbance, dust suppression is an important aspect of managing its spread.

Valley fever is not contagious, and therefore, cannot be passed on from person to person. Most of those who are infected will recover without treatment within six months and will have a life-long immunity to the fungal spores. In severe cases, such as patients with rapid and extensive primary illnesses, those who are at risk for dissemination of disease, and those who have disseminated disease, anti-fungal drug therapy is used. Only one to two percent of those exposed who seek medical attention will develop a disease that disseminates to other parts of the body than the lungs.

There are measures that can be implemented to lower the incidence of infection and also reduce the numbers of spores inhaled, thereby decreasing the chances of developing a more serious form of the disease. These measures include dust control and prevention, use of dust masks with appropriate filters, use of construction equipment with enclosed, air-conditioned cabs, and/or positioning of construction workers upwind when possible. Furthermore, infection risk can also be lowered by conducting outdoor activities, such as field studies or construction activities, in the winter months; avoiding sites favorable for *Coccidioidesimmitis* growth; seeking prompt medical treatment if flu-like or respiratory illness occurs during or within a few weeks following fieldwork or construction activities; getting a coccidioidin skin test to determine susceptibility to the disease; or by educating all members of the field party and construction crew about the possibilities and consequences of infection.

Construction of the proposed project would occur in an endemic area where *Coccidioides immitis* naturally occurs. Temporary soil disturbance during construction grading activities could cause fungal spores (if present) to become airborne, potentially putting construction personnel, residents, and wildlife at risk of contracting Valley Fever. However, as noted above, most Valley Fever cases are very mild, and more than half of infected people either have no symptoms or experience flu-like symptoms and never seek medical attention. There are a number of preventive and precautionary measures that can be undertaken to reduce exposure and which include the use of dust masks when conducting outdoor activities, such as field studies or performing construction activities in the winter months; seeking prompt medical treatment if flu-like or respiratory illness occurs during or within a few weeks following fieldwork or construction activities; getting a coccidioidin skin test to determine susceptibility to the disease; and educating all members of the field party and construction crew about the possibilities and consequences of infection. Dust control measures are the main defense against infection, although all persons residing or traveling through the High Desert would be susceptible to the disease, regardless of whether or not the project is implemented.

Compliance with measures listed under Avoidance, Minimization, and/or Mitigation Measures – Air Quality would control dust during project construction. As a result, this measure would reduce the potential for contact with *Coccidioides immitis* spores and, as such, the potential for health impacts during construction of the project associated with Valley Fever would be minimized.

As for the construction workers, adhering to the Occupational Safety and Health Administration (OSHA) rules (including Injury and Illness Prevention, Control of Harmful Exposures, Respiratory Protection) would adequately provide for the protection of the project's workforce from Valley Fever.

Climate Change

Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, climate change is discussed in Section 4.4

of this document. The CEQA analysis in Section 4.4 will be used to inform the NEPA determination for the project.

Avoidance, Minimization, and/or Mitigation Measures

Caltrans Standard Specifications for construction Sections 10, 18, 7-1.01F, 14-9.03 [Dust Control], and 14-9.02 [Air Pollution Control]) would be adhered to in order to reduce emissions generated by construction equipment. Additionally, the SCAQMD and AVAQMD have established rules for reducing fugitive dust emissions. The control measures specified in SCAQMD Rule 403 and AVAQMD Rule 403 shall be incorporated into the project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day) and Measures AQ-1 through AQ-6, fugitive dust and exhaust emissions from construction activities would not result in any adverse air quality impacts.

The following measures would be implemented during construction activities.

AQ-1 During clearing, grading, earthmoving, or excavation operations, excessive fugitive dust emissions would be controlled by regular watering or other dust preventive measures using the following procedures, as specified in the South Coast Air Quality Management District (SCAQMD) Rule 403:

- All material excavated or graded would be sufficiently watered to prevent excessive amounts of dust.
- Watering would occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day.
- All material transported on site or off site would be either sufficiently watered or securely covered to prevent excessive amounts of dust.
- The area disturbed by clearing, grading, earthmoving, or excavation operations would be minimized so as to prevent excessive amounts of dust.
- Visible dust beyond the property line emanating from the project would be prevented to the maximum extent feasible.

Additionally, the Best Available Control Measures (BACMs) and Reasonably Available Control Measures (RACMs) specified in SCAQMD's Rule 403 Implementation Handbook shall be incorporated into the project construction.

AQ-2 Project grading plans would show the duration of construction. Ozone precursor emissions from construction equipment vehicles would be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications.

AQ-3 All trucks that are to haul excavated or graded material on site would comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4), as amended, regarding the prevention of such material spilling onto public streets and roads.

AQ-4 The contractor would adhere to the California Department of Transportation (Caltrans) Standard Specifications for Construction (Sections 14.9-02 and 14-9.03).

AQ-5 Should the project geologist determine that asbestos-containing materials (ACMs) are present at the project study area during final inspection prior to construction, the appropriate methods would be implemented to remove ACMs.

AQ-6 All construction vehicles both on- and off-site shall be prohibited from idling in excess of 5 minutes.

The following measures would also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

AQ-7 Landscaping reduces surface warming, and through photosynthesis, decreases CO_2. Landscaping would be provided where necessary within the corridor to provide aesthetic treatment, replacement planting, or mitigation planting for the project. The landscape planting would help offset any potential CO_2 emissions increase.

AQ-8 The project would recommend the use of energy-efficient lighting, such as light emitting diode (LED) traffic signals. LED bulbs—or balls, in the stoplight vernacular—cost $60 to $70 apiece but last five to six years, compared to the one-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which would also help reduce the project's CO_2 emissions.

AQ-9 According to Caltrans Standard Special Provisions, idling time for lane closure during construction is restricted to 10 minutes in each direction. In addition, the contractor must comply with Title 13, California Code of Regulations (CCR) Section 2449(d)(3) that was adopted by the ARB on June 15, 2008. This regulation restricts idling of construction vehicles to no longer than 5 consecutive minutes. Compliance with this regulation reduces harmful emissions from diesel-powered construction vehicles.

AQ-10 Pursuant to 40 CFR 93.115 and 93.117, construction activities would be required to comply with the mitigation and control measures included in Appendix IV-A of the 2007 AQMP.

3.2.7 NOISE AND VIBRATION

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

The California Environmental Quality Act requires a strictly baseline versus build analysis to assess whether a proposed project would have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section would focus on the NEPA 23 Code of Federal Regulations (CFR) 772 noise analysis; please see Chapter 4 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and the Department, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 Code of Federal

Regulations [CFR] 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

Table 79: Noise Abatement Criteria

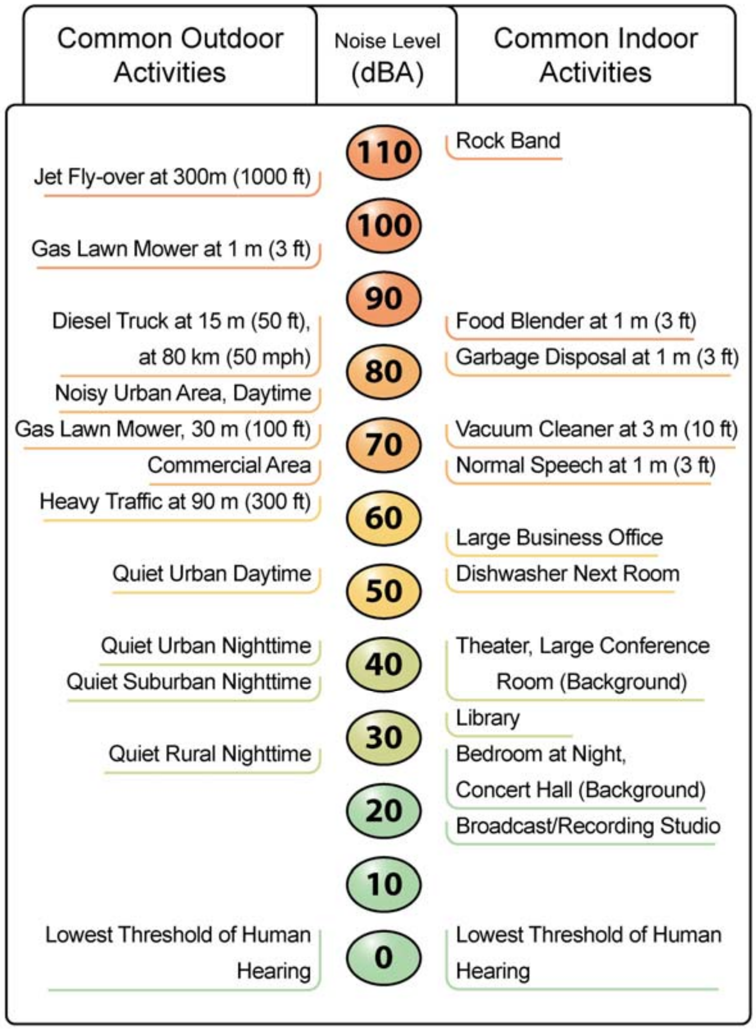
Activity Category	NAC, Hourly A- Weighted Noise Level, Leq(h)	Description of activity category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.

Source: Caltrans, Noise Study Report, 2015

Figure 55 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

Figure 55 Noise Levels of Common Activities



Source: Caltrans, Noise Study Report, 2015

According to the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011*, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.
The Department's *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. Noise abatement must be predicted to reduce noise by at least 5dBA to an

impacted receptor to be considered feasible from an acoustical perspective. Other considerations include topography, access requirements, other noise sources, and safety considerations. The overall reasonableness is determined by these factors: acoustical design goal, the cost of abatement, and viewpoints of benefited receptors (including property owners and residents of the benefited receptors). 23 CFR 722 requires that an acoustical design goal be applied to all noise abatement. Caltrans' acoustical design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction at one or more benefited receptors.

Affected Environment

The Traffic Noise Study Report was completed on August 28, 2015, and a revised report was completed on August 23, 2016. A field noise investigation was conducted to determine existing noise levels and gather information to develop and calibrate the traffic noise model that was used for predicting future noise levels. Ambient noise levels are measured along SR-138 within project limit. Existing ambient noise levels provide a base line for comparison to predicted future noise levels. The measurements are also used to describe the current noise environment in the area of the proposed project.

The field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. Land uses in the project area were categorized by land use types, activity categories, and the extent of frequent human use. As stated in the Protocol, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Although all developed land uses are evaluated in this analysis, the focus is on locations of frequent human use that would benefit from a lowered noise level. Accordingly, the noise impact analysis focuses on locations with defined frequent human use areas, such as residences, schools, libraries, churches and temples, hospitals, recreation and sport areas, playgrounds, cemeteries, golf courses, hotels, and motels.

Short-term measurement locations were selected to represent each major developed area within the project area and selected to serve as representative modeling locations. Long-term measurements were conducted in order to capture diurnal traffic noise level patterns in the project area. Several other non-measurement locations were selected as modeling locations. The field survey for all noise measurements included visiting the project sites in order to identify land uses within the project limits and to select the noise measurement sites.

The noise measurement sites were selected taking into consideration the following general site requirements:

1. Sites were acoustically representative of areas and conditions of interest. They were located at areas of human use.

2. Sites were clear of major obstructions between source and receiver. Microphone positions were more than 10 feet away from reflecting surfaces.

3. Sites were free of noise contamination by sources other than those of interest. Sites were not located near barking dogs, lawn mowers, pool pumps, air conditioners, etc.

4. Sites were not exposed to prevailing meteorological conditions that are beyond the constraints discussed in the Technical Noise Supplement (TeNs).

The entire area within the project limits was acoustically represented by 72 noise site locations. Existing noise levels were recorded at 19 locations and modeled at 53 locations. These locations are acoustically representative of the noise environment and land uses within the limits of the project. The existing ambient noise levels measured were between 52 and 66 decibels (dBA). Three long-term (24-hour) noise level readings were conducted to determine the noisiest hour within the project limits.

Sound level readings, traffic counts and pertinent field data such as traffic flow speed and topography of the locations were used to develop the computer traffic noise model for each analysis site. The computer traffic noise model was then used to predict future noise levels to identify traffic noise impacts and recommend abatement for the impacted area. The computer program Traffic Noise Model (TNM 2.5), FHWA's Traffic Noise Prediction Model (FHWA-RD-77-108), was used in this analysis to develop the traffic noise model for both existing and design year conditions.

This noise analysis has been performed for all three build Alternatives. Some of the intersection treatment options include roundabouts and noise analysis was done using typical roundabout sections available. Alternatives were based on the project year (2040) traffic data forecast. The future noise levels have been predicted to be in the range of 48 – 75 dBA-Leq(h).

Environmental Consequences

Under 23 CFR772.7, projects are categorized as Type I, Type II projects, or Type III projects. FHWA defines a Type I project as a proposed federal or federal-aid highway project for the construction of a highway on a new location, or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. Based on the above brief description of the alternatives, this project has been deemed to be a Type I project. As such, traffic noise analysis has been conducted for this project in accordance with the Protocol for Type I projects.

The traffic noise analysis indicates that under all build alternatives residential areas within the project limits would have noise levels that would approach or exceed FHWA Noise Abatement Criteria (NAC). A traffic noise impact also occurs when there is a substantial noise increase (12 dBA or more from existing baseline conditions).

Based on the traffic noise levels, noise abatement has been considered for the impacted receptors. As stated in 23 CFR 772 and in Caltrans Protocol, noise abatement is considered where noise impacts are predicted and where frequent human use occurs and where a lowered noise level would be of benefit.

Table 80: Alternative 1 Main Alignment Traffic Noise Measurements & Modeling Results (1 of 3)														
Receiver	Direction	Location	Land Use	Noise Abatement Category	Field-Measured Noise Level	Modeled Noise Level	K - Factor	Existing Worst-Hour Noise Level	Future (2040) No Build Noise Level	Noise Increase (No Build Vs. Existing)	Future Worst-Hour Noise Level	Impact Type	Noise Increase (Build Vs. Existing)	Noise Increase (Build Vs. No Build)
A[24]	EB	33628 SR-138		B (67)	63.2	65.4	-2.2	66.0	71.3	5.3	66.1	A/E	0.1	-5.2
A1	EB	34860 SR-138			66.0	68.7	-2.7	69.2	Calibration purpose only					
A1M	EB	34860 Lancaster Road			-	54.9	-	55.4	61.4	6.0	75.4	A/E	20.0	14.0
A2	EB	34315 Lancaster Road			59.4	58.4	1.0	61.6	65.2	3.6	Full Right of Way Acquisition			
A2M	EB	34255 Lancaster Road			-	54.8	-	58.0	60.7	2.7	73.1	A/E	15.1	12.4
A3b	EB	29826 Lancaster Road			59.6	59.5	0.1	61.3	61.6	0.3	59.5	N	-1.8	-2.1
A3M1	EB	29860 Lancaster Road			-	52.0	-	53.0	53.2	0.2	Full Right of Way Acquisition			
A3M2	WB	29853 W Avenue C6			-	62.2	-	63.9	65.0	1.1	59.2	N	-4.7	-5.8
A3M3	EB	29840 Lancaster Road			-	55.1	-	56.1	56.5	0.4	61.4	N	5.3	4.9
A3M4	WB	29669 Lancaster Road			-	49.7	-	50.0	50.5	0.5	52.4	N	2.4	1.9
A4	WB	49717 Margalo Drive			59.7	60.5	-0.8	62.9	65.4	2.5	56.4	N	-6.5	-9.0
A4M1	WB	28945 W Avenue C6			-	52.0	-	55.2	55.6	0.4	54.8	N	-0.4	-0.8
A4M2	WB	28915 W Avenue C6			-	54.0	-	57.2	57.9	0.7	55.5	N	-1.7	-2.4
A4M3	WB	28845 Lancaster Road			-	55.8	-	59.0	60.1	1.1	55.4	N	-3.6	-4.7
A4M4	WB	28725 W Avenue C6			-	52.6	-	55.8	56.3	0.5	54.6	N	-1.2	-1.7
A4M5	WB	28541 Lancaster Road			-	54.5	-	57.7	58.5	0.8	55.3	N	-2.4	-3.2
A5	WB	28241 Lancaster Road			61.5	60.4	1.1	63.6	63.6	0.0	54.8	N	-8.8	-8.8
A5M1	WB	49720 Margalo Drive			-	58.3	-	60.4	61.8	1.4	54.4	N	-6.0	-7.4
A5M2	WB	28091 W Avenue C6			-	55.4	-	57.5	58.1	0.6	54.1	N	-3.4	-4.0

Source: Caltrans, Noise Study Report, 2015

Note: All noise levels are in dBA-Leq(h) [24] 24-Hour noise measurement site Impact Type: N=No Impact; A/E=Approach/Exceed, S=Substantial Increase

Table 81: Alternative 1 Main Alignment Traffic Noise Measurements & Modeling Results (2 of 3)

Traffic Noise Measurements & Modeling Results - State Route 138 Alternative 1

Receiver	Direction	Location	Land Use	Noise Abatement Category	Field-Measured Noise Level	Modeled Noise Level	K - Factor	Existing Worst-Hour Noise Level	Future (2040) No Build Noise Level	Noise Increase (No Build Vs. Existing)	Future Worst-Hour Noise Level Alternative 1	Impact Type	Noise Increase (Build Vs. Existing)	Noise Increase (Build Vs. No Build)
B[24]	WB	28241 Lancaster Road	Residential	B (67)	-	60.2	-	62.3	63.6	1.3	54.6	N	-7.7	-9.0
B1	WB	26803 W Avenue C15			54.2	56.6	-2.4	55.4	58.8	3.4	60.9	N	5.5	2.1
B1M1	EB	49197 265th St. W			-	47.9	-	47.9	47.9	0.0	55.9	N	8.0	8.0
B1M2	EB	49155 265th St W			-	47.9	-	47.9	47.9	0.0	66.1	A/E	18.2	18.2
B1M3	WB	26335 W AVENUE C15			-	59.7	-	60.9	62.6	1.7	60.3	N	-0.6	-2.3
B1M4	EB	49155 Three Points Road			-	47.9	-	47.9	47.9	0.0	64.6	S	16.7	16.7
B1M5	WB	26115 W Avenue C13			-	47.9	-	47.9	47.9	0.0	52.6	N	4.7	4.7
B1M6	WB	26019 W Avenue C13			-	47.9	-	47.9	45.9	-2.0	52.3	N	4.4	6.4
B2	WB	25649 W Lancaster Road(Ext)*	Church	D (52)	59.7	63.1	-3.4	62.0	66.1	4.1	60.4	Calibration purpose only		
		(Interior)			40.0	-	-	42.3	46.4	4.1	40.7	N	-1.6	-5.7
B2M2	WB	49360 Three Points Road	Residential	B (67)	-	51.8	-	52.8	53.3	0.5	56.9	N	4.1	3.6
B2M3	WB	49401 259Th ST W			-	48.9	-	49.9	50.1	0.2	55.3	N	5.4	5.2
B2M4	WB	25765 Kingsrest Avenue			-	49.9	-	50.0	51.0	1.0	55.3	N	5.3	4.3
B2M5	WB	25310 La Petite Avenue			-	49.4	-	49.4	50.0	0.6	53.8	N	4.4	3.8
B3	EB	23134 W Avenue D			52.0	55.8	-3.8	54.1	62.1	8.0	Full Right of Way Acquisition			
B3M1	EB	25221 La Petite Avenue			-	49.4	-	51.5	53.2	1.7	55.0	N	3.5	1.8
B3M2	WB	25009 Heather Hill Avenue			-	47.9	-	47.9	48.1	0.2	51.9	N	4.0	3.8
B3M3	WB	24825 W Avenue D			-	53.2	-	55.3	58.6	3.3	59.2	N	3.9	0.6
B3M4	WB	49079 235th Street W,			-	47.9	-	47.9	47.9	0.0	52.0	N	4.1	4.1
B3M5	WB	23335 W Avenue D4			-	47.9	-	47.9	47.9	0.0	52.0	N	4.1	4.1
B3M6	EB	22929 W Avenue D			-	47.9	-	49.5	51.7	2.2	57.3	N	7.8	5.6
B4	EB	20502 W Avenue D			54.7	53.3	1.4	56.0	57.2	1.2	58.7	N	2.7	1.5
B4M1	EB	18333 190th St W			-	53.7	-	55.0	57.7	2.7	57.5	N	2.5	-0.2
B5	EB	18140 W Avenue D			61.2	57.8	3.4	61.9	61.9	0.0	61.5	N	-0.4	-0.4
B5M1	WB	18348 W AVENUE D			-	60.9	-	62.1	65.2	3.1	65.1	N	3.0	-0.1

Note: All noise levels are in dBA-Leq(h) [24] 24-Hour noise measurement site * Calibration purpose only. No exterior frequent human use area identified.

Impact Type: N=No Impact; A/E=Approach/Exceed

S=Substantial Increase

Source: Caltrans, Noise Study Report, 2015

Table 82: Alternative 1 Main Alignment Traffic Noise Measurements & Modeling Results (3 of 3)

Receiver	Direction	Location	Land Use	Noise Abatement Category	Field-Measured Noise Level	Modeled Noise Level	K - Factor	Existing Worst-Hour Noise Level	Future (2040) No Build Noise Level	Noise Increase (No Build Vs. Existing)	Future Worst-Hour Noise Level Alternative 1	Impact Type	Noise Increase (Build Vs. Existing)	Noise Increase (Build Vs. No Build)
C1	EB	10120 W HWY138	Residential	B (67)	58.9	59.3	-0.4	61.6	Calibration purpose only					
C1M2	EB	49050 130th ST W			-	47.9	-	47.9	47.9	0.0	55.1	N	7.2	7.2
C1M3	EB	10120 W AVE D			-	54.1	-	56.4	57.5	1.1	63.2	N	6.8	5.7
C[24]	EB	8622 West Ave D			63.7	64.8	-1.1	66.2	70.9	4.7	62.5	N	-3.7	-8.4
CM1	WB	49255 87th Street W			-	48.2	-	48.2	51.4	3.2	62.6	S	14.4	11.2
CM2	WB	8316 W Avenue C			-	49.3	-	49.3	51.0	1.7	61.5	S	12.2	10.5
CM3	WB	49239 80th Street W			-	49.9	-	49.9	51.6	1.7	63.4	S	13.5	11.8
CM4	EB	8839 W Avenue D2			-	47.9	-	47.9	51.1	3.2	52.6	N	4.7	1.5
CM5	EB	8656 W Avenue D			-	59.1	-	61.9	64.0	2.1	59.3	N	-2.6	-4.7
CM6	EB	8538 W Avenue D			-	62.4	-	65.2	68.0	2.8	61.4	N	-3.8	-6.6
CM7	EB	8345 W Avenue D2			-	50.5	-	50.5	51.4	0.9	52.7	N	2.2	1.3
CM8	EB	8212 W Avenue D			-	58.2	-	59.6	60.6	1.0	57.8	N	-1.8	-2.8
CM9	EB	8115 W Avenue D2			-	51.1	-	51.1	52.1	1.0	53.3	N	2.2	1.2
CM10	WB	8206 W AVE C14			-	49.3	-	49.3	51.0	1.7	61.7	S	12.4	10.7
CM11	WB	8114 W AVE C14			-	49.3	-	49.3	51.0	1.7	60.3	N	11.0	9.3
C2	EB	8816 W Avenue D			56.4	58.8	-2.4	59.2	63.6	4.4	59.3	N	0.1	-4.3
C3	WB	8751 W Avenue D			56.3	57.9	-1.6	60.7	64.5	3.8	Full Right of Way Acquisition			
C4	EB	8212 W Avenue D			64.9	62.5	2.4	65.4	65.4	0.0	60.3	N	-5.1	-5.1
C5	WB	8109 W Avenue D			56.1	59.0	-2.9	58.0	63.6	5.6	Full Right of Way Acquisition			
C6	EB	49141 80th Street West			61.6	57.6	4.0	64.6	64.6	0.0	60.4	N	-4.2	-4.2
C6M2	WB	5329 W AVE C14			-	47.9	-	47.9	47.9	0.0	54.2	N	6.3	6.3
C6M3	WB	49250 52nd ST W			-	49.3	-	52.3	52.8	0.5	61.8	N	9.5	9.0
C6M4	WB	4125 W AVE D			-	50.0	-	52.9	53.5	0.6	65.0	S	12.1	11.5

Note: All noise levels are in dBA-Leq(h)
Impact Type: N=No Impact; A/E=Approach/Exceed
S=Substantial Increase

__[24] 24-Hour noise measurement site

Source: Caltrans, Noise Study Report, 2015

Table 83: Alternative 1 – Antelope Acres Bypass Option Traffic Noise Measurements & Modeling Results

Receiver	Direction	Location	Land Use	Noise Abatement Category	Field-Measured Noise Level	Modeled Noise Level	K - Factor	Existing Worst-Hour Noise Level	Future (2040) No Build Noise Level	Noise Increase (No Build Vs. Existing)	Future Worst-Hour Noise Level Alternative 1	Impact Type	Noise Increase (Build Vs. Existing)	Noise Increase (Build Vs. No Build)
C1	EB	10120 W HWY138	Residential	B (67)	58.9	59.3	-0.4	61.6	Calibration purpose only					
C1M2	EB	49050 130th ST W			-	47.9	-	47.9	47.9	0.0	55.0	N	7.1	7.1
C1M3	EB	10120 W AVE D			-	54.1	-	56.4	57.5	1.1	63.7	N	7.3	6.2
LM1	EB	8847 W AVE C4			-	47.9	-	47.9	47.9	0.0	51.0	N	3.1	3.1
LM2	EB	8744 W AVE C			-	47.9	-	47.9	47.9	0.0	63.2	S	15.3	15.3
LM3	EB	8606 W AVE C			-	47.9	-	47.9	47.9	0.0	64.6	S	16.7	16.7
LM4	EB	8505 AVE C			-	51.2	-	51.2	51.2	0.0	64.8	S	13.6	13.6
LM5	EB	8040 W AVE C			-	51.2	-	51.2	51.2	0.0	65.1	S	13.9	13.9
LM6	EB	49913 80TH ST. W			-	51.2	-	51.2	51.2	0.0	56.8	N	5.6	5.6
LM7	EB	8747 W AVE C2			-	47.9	-	47.9	47.9	0.0	57.1	N	9.2	9.2
C6M2	WB	5329 W AVE C14			-	47.9	-	47.9	47.9	0.0	54.2	N	6.3	6.3
C6M3	WB	49250 52nd ST W			-	49.3	-	52.3	52.8	0.5	61.8	N	9.5	9.0
C6M4	WB	4125 W AVE D			-	50.0	-	52.9	53.5	0.6	65.0	S	12.1	11.5

Note: All noise levels are in dBA-Leq(h) __[24] 24-Hour noise measurement site

Impact Type: N=No Impact; A/E=Approach/Exceed, S=Substantial Increase

Source: Caltrans, Noise Study Report, 2015

Table 84: Alternative 2 Traffic Noise Measurements & Modeling Results (1 of 3)

Receiver	Direction	Location	Land Use	Noise Abatement Category	Field-Measured Noise Level	Modeled Noise Level	K - Factor	Existing Worst-Hour Noise Level	Future (2040) No Build Noise Level	Noise Increase (No Build Vs. Existing)	Future Worst-Hour Noise Level Alternative 2	Impact Type	Noise Increase (Build Vs. Existing)	Noise Increase (Build Vs. No Build)
A[24]	EB	33628 hwy 138	Residential	B (67)	63.2	65.4	-2.2	66.0	71.3	5.3	62.6	N	-3.4	-8.7
A1	EB	34860 hwy 138			66.0	68.7	-2.7	69.2	Calibration purpose only					
A1M	EB	34860 Lancaster Road			-	54.9	-	55.4	61.4	6	74.9	A/E	19.5	13.5
A2	EB	34315 Lancaster Road			59.4	58.4	1.0	61.6	65.2	3.6	Full Right of Way Acquisition			
A2M	EB	34255 Lancaster Road			-	54.8	-	58.0	60.7	2.7	72.9	A/E	14.9	12.2
A3b	EB	29826 Lancaster Road			59.6	59.5	0.1	61.3	61.6	0.3	58.6	N	-2.7	-3.0
A3M1	EB	29860 Lancaster Road			-	52.0	-	53.0	53.2	0.2	65.9	A/E	12.9	12.7
A3M2	WB	29853 W Avenue C6			-	62.2	-	63.9	65.0	1.1	56.1	N	-7.8	-8.9
A3M3	EB	29840 Lancaster Road			-	55.1	-	56.1	56.5	0.4	61.1	N	5.0	4.6
A3M4	WB	29669 Lancaster Road			-	49.7	-	50.0	50.5	0.5	51.9	N	1.9	1.4
A4	WB	49717 Margalo Drive			59.7	60.5	-0.8	62.9	65.4	2.5	56.1	N	-6.8	-9.3
A4M1	WB	28945 W Avenue C6			-	52.0	-	55.2	55.6	0.4	54.5	N	-0.7	-1.1
A4M2	WB	28915 W Avenue C6			-	54.0	-	57.2	57.9	0.7	54.9	N	-2.3	-3.0
A4M3	WB	28845 Lancaster Road			-	55.8	-	59.0	60.1	1.1	55.4	N	-3.6	-4.7
A4M4	WB	28725 W Avenue C6			-	52.6	-	55.8	56.3	0.5	54.7	N	-1.1	-1.6
A4M5	WB	28541 Lancaster Road			-	54.5	-	57.7	58.5	0.8	55	N	-2.7	-3.5
A5	WB	28241 Lancaster Road			61.5	60.4	1.1	63.6	63.6	0	55.2	N	-8.4	-8.4
A5M1	WB	49720 Margalo Drive			-	58.3	-	60.4	61.8	1.4	54.8	N	-5.6	-7.0
A5M2	WB	28091 W Avenue C6			-	55.4	-	57.5	58.1	0.6	54.4	N	-3.1	-3.7
B[24]	WB	28241 Lancaster Road			-	60.2	-	62.3	63.6	1.3	55	N	-7.3	-8.6
B1	WB	26803 W Avenue C15			54.2	56.6	-2.4	55.4	58.8	3.4	61.1	N	5.7	2.3
B1M1	EB	49197 265th St. W			-	47.9	-	47.9	47.9	0.0	54.7	N	6.8	6.8
B1M2	EB	49155 265th St W			-	47.9	-	47.9	47.9	0.0	66.5	A/E	18.6	18.6
B1M3	WB	26335 W AVENUE C15			-	59.7	-	60.9	62.6	1.7	59.8	N	-1.1	-2.8
B1M4	EB	49155 Three Points Road			-	47.9	-	47.9	47.9	0.0	63.9	S	16.0	16.0
B1M5	WB	26115 W Avenue C13			-	47.9	-	47.9	47.9	0.0	52.4	N	4.5	4.5
B1M6	WB	26019 W Avenue C13			-	47.9	-	47.9	47.9	0.0	51.8	N	3.9	3.9

Note: All noise levels are in dBA-Leq(h)
Impact Type: N=No Impact; A/E=Approach/Exceed
S=Substantial Increase

__[24] 24-Hour noise measurement site

Source: Caltrans, Noise Study Report, 2015

Table 85: Alternative 2 Traffic Noise Measurements & Modeling Results (2 of 3)

Traffic Noise Measurements & Modeling Results - State Route 138 Alternative 2														
Receiver	**Direction**	**Location**	**Land Use**	**Noise Abatement Category**	**Field-Measured Noise Level**	**Modeled Noise Level**	**K - Factor**	**Existing Worst-Hour Noise Level**	**Future (2040) No Build Noise Level**	**Noise Increase (No Build Vs. Existing)**	**Future Worst-Hour Noise Level Alternative 2**	**Impact Type**	**Noise Increase (Build Vs. Existing)**	**Noise Increase (Build Vs. No Build)**
B2	WB	25649 W Lancaster Road(Ext)*	Church	D (52)	59.7	63.1	-3.4	62.0	66.1	4.1	60.2	Calibration purpose only		
		(Interior)			40.0	-	-	42.3	46.4	4.1	40.5	N	-1.8	-5.9
B2M2	WB	49360 Three Points Road	Residential	B (67)	-	51.8	-	52.8	53.3	0.5	56.2	N	3.4	2.9
B2M3	WB	49401 259Th ST W			-	48.9	-	49.9	50.1	0.2	54.9	N	5.0	4.8
B2M4	WB	25765 Kingsrest Avenue			-	49.9	-	50.0	51.0	1.0	55.2	N	5.2	4.2
B2M5	WB	25310 La Petite Avenue			-	49.4	-	49.4	50.0	0.6	53.7	N	4.3	3.7
B3	EB	23134 W Avenue D			52.0	55.8	-3.8	54.1	62.1	8.0	Full Right of Way Acquisition			
B3M1	EB	25221 La Petite Avenue			-	49.4	-	51.5	53.2	1.7	54.8	N	3.3	1.6
B3M2	WB	25009 Heather Hill Avenue			-	47.9	-	47.9	48.1	0.2	51.5	N	3.6	3.4
B3M3	WB	24825 W Avenue D			-	53.2	-	55.3	58.6	3.3	58.9	N	3.6	0.3
B3M4	WB	49079 235th Street W,			-	47.9	-	47.9	47.9	0.0	51.4	N	3.5	3.5
B3M5	WB	23335 W Avenue D4			-	47.9	-	47.9	47.9	0.0	51.4	N	3.5	3.5
B3M6	EB	22929 W Avenue D			-	47.9	-	49.5	51.7	2.2	54.7	N	5.2	3.0
B4	EB	20502 W Avenue D			54.7	53.3	1.4	56.0	57.2	1.2	58.7	N	2.7	1.5
B4M1	EB	18333 190th St W			-	53.7	-	55.0	57.7	2.7	57.5	N	2.5	-0.2
B5	EB	18140 W Avenue D			61.2	57.8	3.4	61.9	61.9	0.0	61.5	N	-0.4	-0.4
B5M1	WB	18348 W AVENUE D			-	60.9	-	62.1	65.2	3.1	65.1	N	3.0	-0.1
C1	EB	10120 W HWY138			58.9	59.3	-0.4	61.6	Calibration purpose only					
C1M2	EB	49050 130th ST W			-	47.9	-	47.9	47.9	0.0	56.5	N	8.6	8.6
C1M3	EB	10120 W AVE D			-	54.1	-	56.4	57.5	1.1	65.0	N	8.6	7.5

Note: All noise levels are in dBA-Leq(h) __[24] 24-Hour noise measurement site * Calibration purpose only. No exterior frequent human use area identified.
Impact Type: N=No Impact; A/E=Approach/Exceed

Table 86: Alternative 2 Traffic Noise Measurements & Modeling Results (3 of 3)

Traffic Noise Measurements & Modeling Results - State Route 138 Alternative 2														
Receiver	**Direction**	**Location**	**Land Use**	**Noise Abatement Category**	**Field-Measured Noise Level**	**Modeled Noise Level**	**K - Factor**	**Existing Worst-Hour Noise Level**	**Future (2040) No Build Noise Level**	**Noise Increase (No Build Vs. Existing)**	**Future Worst-Hour Noise Level Alternative 2**	**Impact Type**	**Noise Increase (Build Vs. Existing)**	**Noise Increase (Build Vs. No Build)**
C[24]	EB	8622 West Ave D	Residential	B (67)	63.7	64.8	-1.1	66.2	70.9	4.7	Full Right of Way Acquisition			
CM1	WB	49255 87th Street W			-	48.2	-	48.2	51.4	3.2	57.8	N	9.6	6.4
CM2	WB	8316 W Avenue C			-	49.3	-	49.3	51.0	1.7	57.3	N	8.0	6.3
CM3	WB	49239 80th Street W			-	49.9	-	49.9	51.6	1.7	58.2	N	8.3	6.6
CM4	EB	8839 W Avenue D2			-	47.9	-	47.9	51.1	3.2	57.8	N	9.9	6.7
CM5	EB	8656 W Avenue D			-	59.1	-	61.9	64.0	2.1	68.5	A/E	6.6	4.5
CM6	EB	8538 W Avenue D			-	62.4	-	65.2	68.0	2.8	67.8	A/E	2.6	-0.2
CM7	EB	8345 W Avenue D2			-	50.5	-	51.4	51.4	0.0	58.3	N	6.9	6.9
CM8	EB	8212 W Avenue D			-	58.2	-	59.6	60.6	1.0	65.2	N	5.6	4.6
CM9	EB	8115 W Avenue D2			-	51.1	-	52.1	52.1	0.0	59.4	N	7.3	7.3
C2	EB	8816 W Avenue D			56.4	58.8	-2.4	59.2	63.6	4.4	68.9	A/E	9.7	5.3
C3	WB	8751 W Avenue D			56.3	57.9	-1.6	60.7	64.5	3.8	70.5	A/E	9.8	6.0
C4	EB	8212 W Avenue D			64.9	62.5	2.4	65.4	65.4	0.0	71.0	A/E	5.6	5.6
C5	WB	8109 W Avenue D			56.1	59.0	-2.9	58.0	63.6	5.6	67.4	A/E	9.4	3.8
C6	EB	49141 80th Street West			61.6	57.6	4.0	64.6	64.6	0.0	67.2	A/E	2.6	2.6
C6M2	WB	5329 W AVE C14			-	47.9	-	47.9	47.9	0.0	53.4	N	5.5	5.5
C6M3	WB	49250 52nd ST W			-	49.3	-	52.3	52.8	0.5	61.4	N	9.1	8.6
C6M4	WB	4125 W AVE D			-	50.0	-	52.9	53.5	0.6	62.5	N	9.6	9.0

Note: All noise levels are in dBA-Leq(h)   __[24] 24-Hour noise measurement site

Impact Type: N=No Impact; A/E=Approach/Exceed

Source: Caltrans, Noise Study Report, 2015

Cumulative Impacts

For the purpose of the noise and vibration cumulative impacts analysis the Resource Study Area (RSA) for noise impacts includes all areas adjacent to the study area where there are sensitive land uses that would be affected by construction noise and traffic noise generated by the operation of the completed project. The study area focuses on those areas in the vicinity of the Build Alternatives with potential noise-sensitive uses.

The proposed project is located in a rural and sparsely populated region in the northwestern portion of Los Angeles County. Existing land uses that could be subject to traffic and construction noises by the completed project comprised mostly residences. There are also commercial areas, trail crossings, and a place of worship within the RSA.

<u>Reasonably Foreseeable Actions and Their Impacts</u>

The California High-Speed Train System (HST) would have a potentially significant impact on noise when viewed on a system-wide basis. The HST would create construction-related short-term noise impacts. The HST would also create long-term noise impacts from introduction of a new transportation system. The significance of the impacts is dependent on the sensitivity of the landscape and noise receptors. The HST has low potential noise impact ratings within the RSA due to the sparseness of residential use and the extent of open space. Also, the nearest noise sensitive receivers (C6M4 and A1) within the RSA are located approximately 3 miles from either of the proposed routes. Within quiet urban residential areas the effect of the HST operations would, depending on speed, and could extend to 1000 feet from the track centerline. Listeners in quieter areas may find HST noticeable but if they are at greater distances from the train tracks than those in urban setting, then they would experience lower passerby sound.

Reasonably foreseeable actions also include the Centennial Specific Plan and Project, a master-planned new town on nearly 12,000 acres of land located near the I-5 and SR-138 junction, surrounding the north and east sides of Quail Lake. The project is located both in unincorporated Los Angeles and Kern Counties. The Specific Plan and Project propose a maximum of 23,000 dwelling units and 14 million total square feet of non-residential development of employment areas and retail serving centers anticipated to be built over a period of approximately 25 to 30 years. Construction of the Centennial Project would result in an increase in the number of receptors associated with the proposed project, and generation of additional traffic.

The project long-range analysis (year 2040) reflected the growth projections from the approved SCAG 2012 RTP. As a result, the 2035 noise analysis of traffic noise reflects the anticipated population growth and traffic that would be associated with cumulative projects. The traffic noise analysis indicates that there would be substantial increases in noise under all build alternatives. Therefore, the proposed project, in combination with related transportation, energy, and other development project would result in adverse cumulative noise impacts.

Avoidance, Minimization, and/or Abatement Measures

In accordance with 23 CFR 772, noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. Potential noise abatement measures identified in the Protocol include the following:

- Avoiding the impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;
- Constructing noise barriers;
- Acquiring property to serve as a buffer zone;
- Using traffic management measures to regulate types of vehicles and speeds; and
- Acoustically insulating public-use or nonprofit institutional structures.

All of these abatement options have been considered. However, because of the configuration and location of the project, abatement in the form of noise barriers is the only abatement that is considered to be practical.

A Noise Abatement Decision Report (NADR), dated February 10, 2017, was approved by Caltrans to determine whether the considered noise abatement measures for the preferred alternative would meet requirements to be recommended. Two determining factors are the feasibility and reasonableness of the soundwalls.

Each noise barrier has been evaluated for feasibility based on achievable noise reduction. For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated using the 2016 figure of $80,000 per benefited residence. For any noise barrier to be considered reasonable from a cost perspective the estimated cost of the noise barrier should be equal to or less than the total cost allowance calculated for the barrier. The cost calculations of the noise barrier should include all items appropriate and necessary for construction of the barrier, such as traffic control, drainage modification, and retaining walls. The NADR determined that all potential soundwalls are not cost reasonable at any of the evaluated heights.

For all impacted receptors, noise abatement has been evaluated for preliminary acoustical feasibility (noise reduction of 5 dBA or more) with calculated reasonable allowances. The overall reasonableness is determined by these factors: noise reduction design goal, the cost of abatement, and viewpoints of benefited receptors (including property owners and residents of the benefited receptors). For a sound barrier to be considered reasonable, the 7 dB design goal must be achieved at one or more benefited receptors. The noise barrier is not required to reduce noise levels to below the NAC for any noise sensitive land uses.

Only acoustically feasible noise abatement measures were analyzed for reasonableness. Table 85 through Table 90 below summarize acoustically feasible soundwall locations, height range, approximate length, noise attenuation range, number of benefited receivers and reasonable allowance. The soundwall locations associated with the Preferred Alternative are graphically shown in Figures 56 through 64.

The following presents the preliminary noise abatement decision pertaining to each of the evaluated soundwalls.

Soundwall SW-1
This soundwall is proposed to be placed at the edge of shoulder along eastbound SR-138 between Gorman Post Road and Cement Plant Road, in front of the historic Kinsey Mansion.The soundwall length will be approximately 900 feet. The recommended height range of 8 to 16 feet ·meets both the noise abatement and noise reduction criteria. There are 2 benefited residences with a reasonable allowance

of $80,000 per residence, giving a total reasonable allowance of $160,000. The estimated construction cost starts at $358,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Soundwall SW-2
This soundwall is proposed to be placed at the edge of shoulder along eastbound SR-138 between Gorman Post Road and Cement Plant Road. The soundwall length will be approximately 500 feet. The recommended height range of 8 to 16 feet meets both the noise abatement and noise reduction criteria. There is 1 benefited residence with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $80,000. The estimated construction cost starts at $199,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Soundwall SW-3
This soundwall is proposed to be placed at the edge of shoulder along westbound SR-138 between 300th Street West and 290th Street West. The soundwall length will be approximately 685 feet. The recommended height range of 12 to 16 feet meets both the noise abatement and noise reduction criteria. There is 1 benefited residence with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $80,000. The estimated construction cost starts at $332,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Soundwall SW-4
There are two soundwalls proposed to be placed at the edge of shoulder along eastbound SR-138 between 269th Street and 265th Street. The soundwall length will be approximately 1304 feet. The recommended height range of 12 to 16 feet meets both the noise abatement and noise reduction criteria. There is 1 benefited residence with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $80,000. The estimated construction cost starts at $632,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.
Soundwall SW-5 & SW-6

There are two soundwalls proposed to be placed at the edge of shoulder along eastbound SR-138 between 265th Street and La Petite Avenue. The soundwall length will be approximately 1060 feet. The recommended height range of 14 to 16 feet meets both the noise abatement and noise reduction criteria. There is 1 benefited residence with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $80,000. The estimated construction cost starts at $559,000, more than the reasonable allowance. Therefore, the construction of these two soundwalls is not cost reasonable.

Soundwall SW-7
This soundwall is proposed to be placed at the edge of shoulder along westbound SR-138 between 90th Street West and 80th Street West. The soundwall length will be approximately 5138 feet. The recommended height range of 8 to 16 feet meets both the noise abatement and noise reduction criteria. There are 7 benefited residence with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $560,000. The estimated construction cost starts at $2,046,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Soundwall SW-8
This soundwall is proposed to be placed at the edge of shoulder along eastbound SR-138 between 90th Street West and 80th Street West. The soundwall length will be approximately 5330 feet. The

recommended height range of 8 to 16 feet meets both the noise abatement and noise reduction criteria. There are 7 benefited residences with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $560,000. The estimated construction cost starts at $2,122,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Roundabout Option

Soundwall SW-7 Roundabout
This soundwall is proposed to be placed at the edge of shoulder along westbound SR-138 between 90th Street West and 80th Street West. The soundwall length will be approximately 4976 feet. The recommended height range of 8 to 16 feet meets both the noise abatement and noise reduction criteria. There are 7 benefited residences with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $560,000. The estimated construction cost starts at $1,981,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Soundwall SW-8 Roundabout
This soundwall is proposed to be placed at the edge of shoulder along eastbound SR-138 between 90th Street West and 80th Street West. The soundwall length will be approximately 4982 feet. The recommended height range of 8 to 16 feet meets both the noise abatement and noise reduction criteria. There are 7 benefited residences with a reasonable allowance of $80,000 per residence, giving a total reasonable allowance of $560,000. The estimated construction cost starts at $1,984,000, more than the reasonable allowance. Therefore, the construction of this soundwall is not cost reasonable.

Based on the results in the NADR, none of the proposed soundwalls were found to be both reasonable and feasible pursuant to 23 CFR 772. However, soundwalls are still proposed for noise impacts under CEQA; see Section 4.2.3.

Table 87: Alternative 1 Acoustically Feasible Sound Barriers (I-5 to 110th St.)

Summary of Acoustically Feasible Sound Barriers On SR-138: Alternative 1 (I-5 to 110th St.)

Soundwall	Direction	Location	Acoustically Feasible Height Range (Feet)	Approximate Length (Feet)	Noise Attenuation Range (dBA)	Number of Benefited Receivers	Reasonable Allowance
SW-1	EB	Between Gorman Post Rd. and Private Rd.	8 to 16	900	6 to 10	2	$160,000
SW-2	EB	Between Gorman Post Rd. and Private Rd.	8 to 16	500	5 to 8	1	$80,000
SW-3+SW-4	EB	Between Gorman Post Rd. and Private Rd.	10 to 16	2446	6 to 7	2 to 6	$160,000 to $480,000
SW-5	EB	Between 280th St. W and three points Rd.	10 to 16	800	5 to 7	1	$80,000
SW-6+SW-7	EB	Between 280th St. W and three points Rd.	12 to 16	1638	6 to 7	1	$80,000

Source: Caltrans, Noise Study Report, August 2016

Table 88: Alternative 1 Acoustically Feasible Sound Barriers (110th St. to SR-14) - Main Alignment Option

Summary of Acoustically Feasible Sound Barriers On SR-138: Alternative 1 (110th St. to SR-14) Main Alignment Option							
Soundwall	Direction	Location	Acoustically Feasible Height Range (Feet)	Approximate Length (Feet)	Noise Attenuation Range (dBA)	Number of Benefited Receivers	Reasonable Allowance
SW-8+SW-9	WB	Between 90 St.W and 60th St. W	10 to 16	5729	5 to 9	2 to 17	$160,000 to $1,360,000
SW-10	WB	Between 60 th St. and 40th St.	10 to 16	1000	5 to 7	1	$80,000

Source: Caltrans, Noise Study Report, August 2016

Table 89: Alternative 1 Acoustically Feasible Sound Barriers (110th St. to SR-14) - Roundabout Option

Summary of Acoustically Feasible Sound Barriers On SR-138: Alternative 1 (110th St. to SR-14) Roundabout Option							
Soundwall	**Direction**	**Location**	**Acoustically Feasible Height Range (Feet)**	**Approximate Length (Feet)**	**Noise Attenuation Range (dBA)**	**Number of Benefited Receivers**	**Reasonable Allowance**
SW-8+SW-9	WB	Between 90 St.W and 60th St. W	12 to 16	5925	5 to 9	7 to 17	$560,000 to $1,360,000

Source: Caltrans, Noise Study Report, August 2016

Table 90: Alternative 1 Acoustically Feasible Sound Barriers (110th St. to SR-14) - Antelope Acres Bypass Option

Summary of Acoustically Feasible Sound Barriers On SR-138: Alternative 1 (110th St. to SR-14) Antelope Acres Option							
Soundwall	**Direction**	**Location**	**Acoustically Feasible Height Range (Feet)**	**Approximate Length (Feet)**	**Noise Attenuation Range (dBA)**	**Number of Benefited Receivers**	**Reasonable Allowance**
SW-8L	WB	Between 90 St.W and 60th St. W	8 to 16	5683	6 to 10	5 to 23	$400,000 to $1,840,000
SW-10	WB	Between 60 th St. and 40th St.	10 to 16	1000	5 to 7	1	$80,000

Source: Caltrans, Noise Study Report, August 2016

Table 91: Alternative 2 Acoustically Feasible Sound Barriers

Summary of Acoustically Feasible Sound Barriers On SR-138: Alternative 2							
Soundwall	**Direction**	**Location**	**Acoustically Feasible Height Range (Feet)**	**Approximate Length (Feet)**	**Noise Attenuation Range (dBA)**	**Number of Benefited Receivers**	**Reasonable Allowance**
SW-1	EB	Between Gorman Post Rd. and Private Rd.	8 to 16	900	6 to 12	2	$160,000
SW-2	EB	Between Gorman Post Rd. and Private Rd.	8 to 16	500	5 to 8	1	$80,000
SW-3	WB	Between 300th St. and 280th St.	12 to 16	669	6 to 7	1	$80,000
SW-4	EB	Between 280th St. W and three points Rd.	12 to 16	1304	6 to 8	1	$80,000
SW-5+SW-6	EB	Between 280th St. W and three points Rd.	12 to 16	1054	5 to 6	1	$80,000
SW-7	WB	Between 90th St. and 80th St.	8 to 16	5075	8 to 14	7 to 19	$560,000 to $1,520,000
SW-8	EB	Between 90th St. and 80th St.	8 to 16	5325	13 to 18	6 to 21	$480,000 to $1,680,000

Source: Caltrans, Noise Study Report, August 2016

Table 92: Alternative 2 Acoustically Feasible Sound Barriers - Roundabout Option

Summary of Acoustically Feasible Sound Barriers On SR-138: Alternative 2 Roundabout Option							
Soundwall	**Direction**	**Location**	**Acoustically Feasible Height Range (Feet)**	**Approximate Length (Feet)**	**Noise Attenuation Range (dBA)**	**Number of Benefited Receivers**	**Reasonable Allowance**
SW-7	WB	Between 90th St. and 80th St.	8 to 16	4976	8 to 14	7 to 19	$560,000 to $1,520,000
SW-8	EB	Between 90th St. and 80th St.	8 to 16	4982	13 to 18	6 to 21	$480,000 to $1,680,000

Source: Caltrans, Noise Study Report, August 2016

Figure 56: Alternative 2 Soundwall Location -1

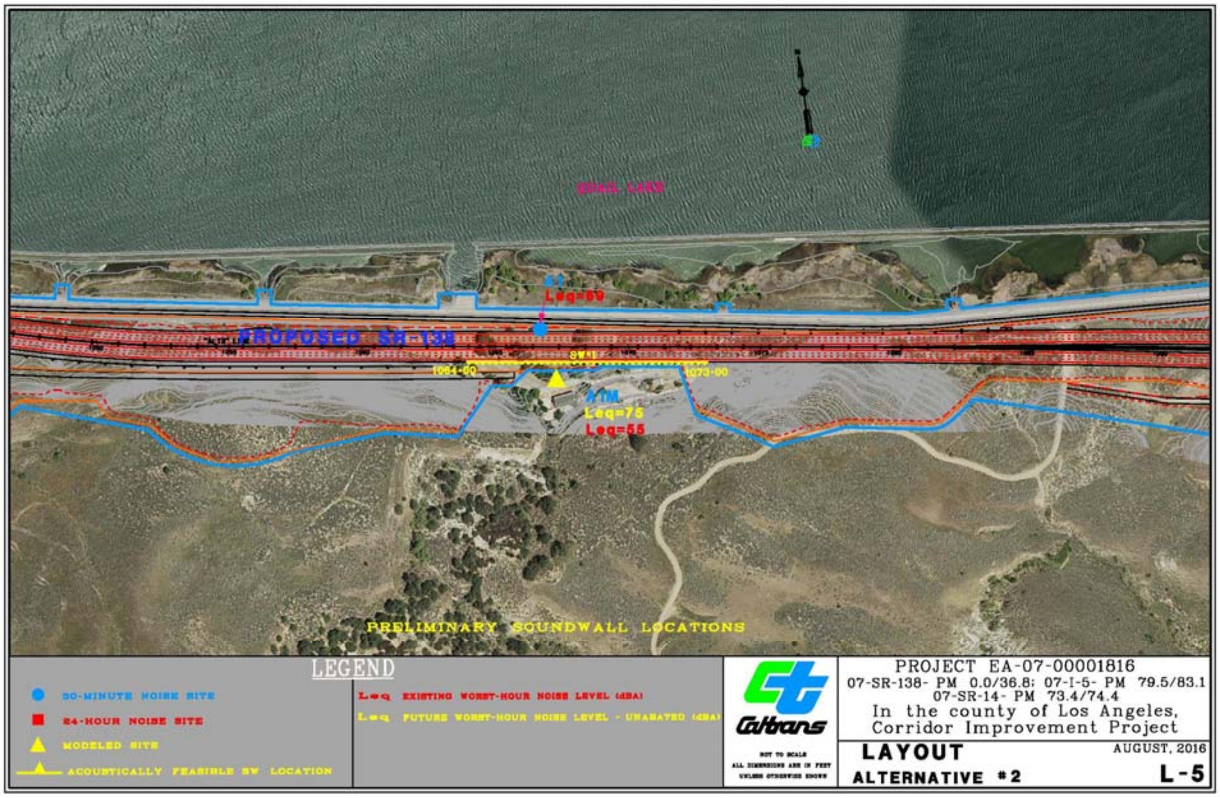


Figure 57: Alternative 2 Soundwall Location -2

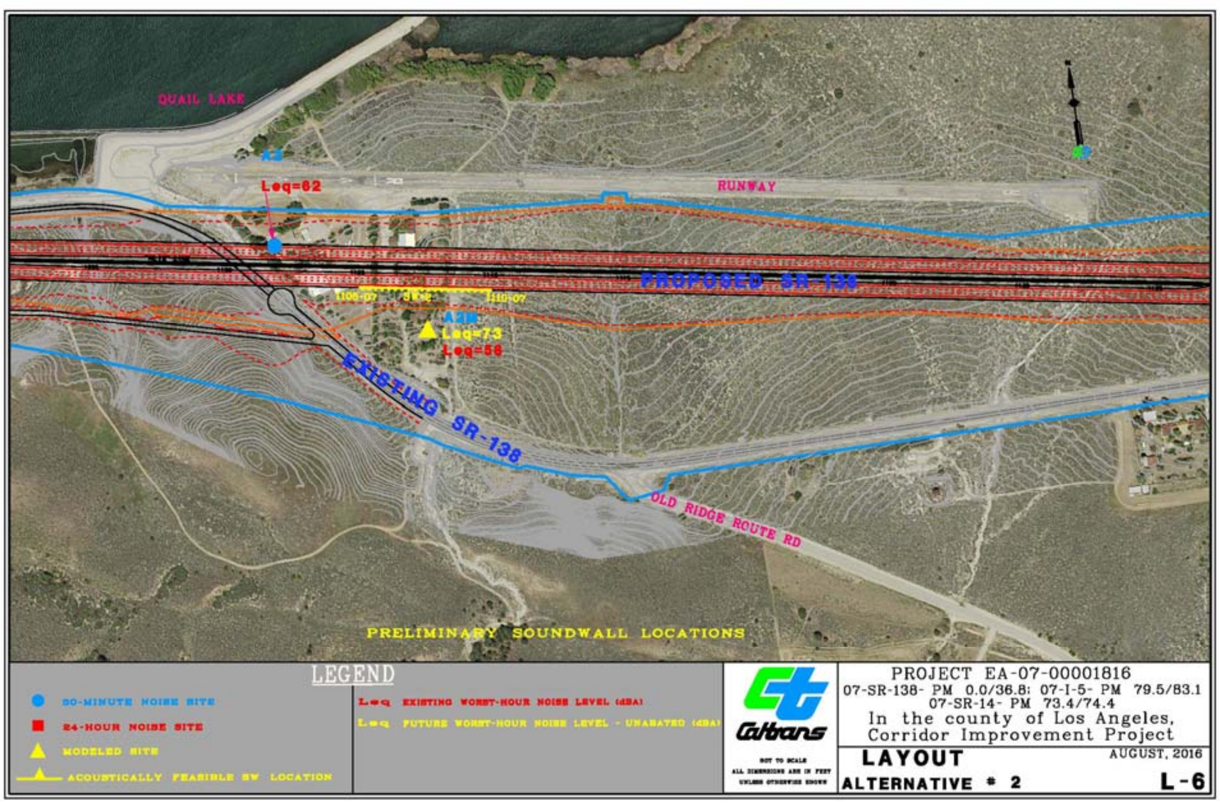


Figure 58: Alternative 2 Soundwall Location - 3

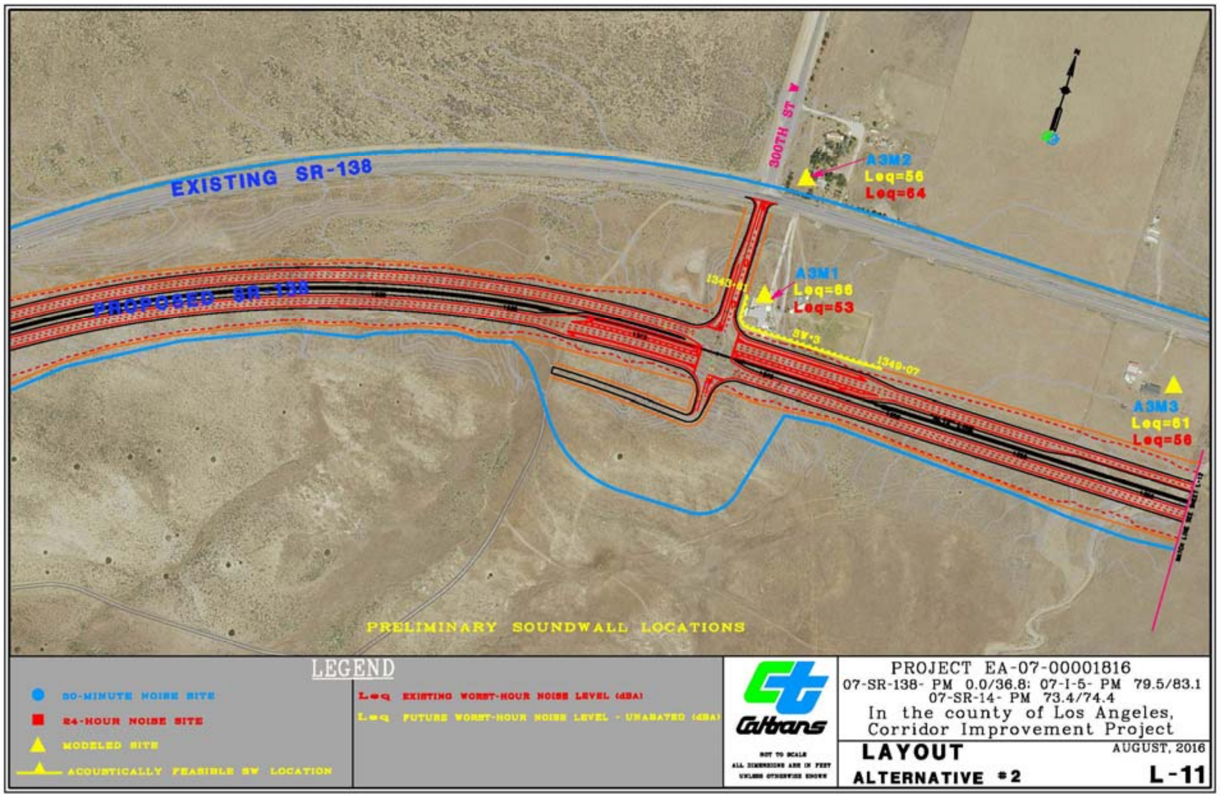


Figure 59: Alternative 2 Soundwall Location - 4

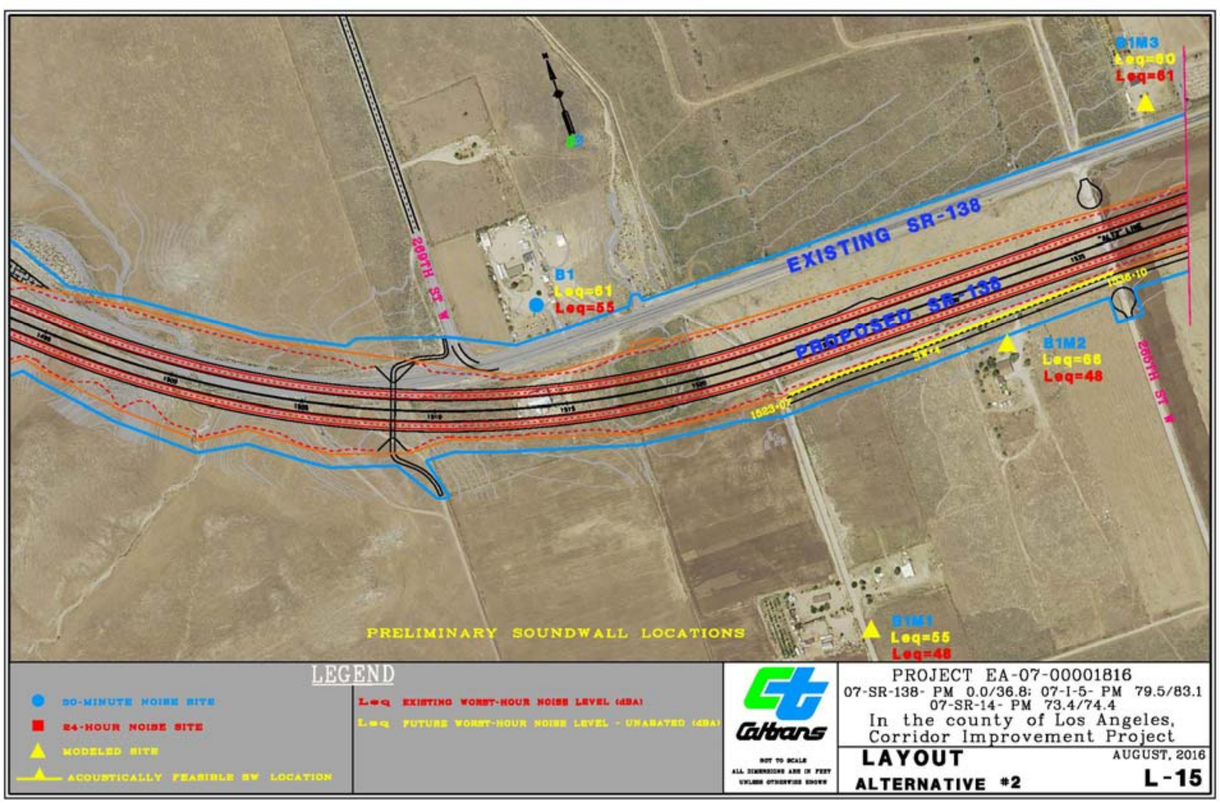


Figure 60: Alternative 2 Soundwall Location – 5 and 6

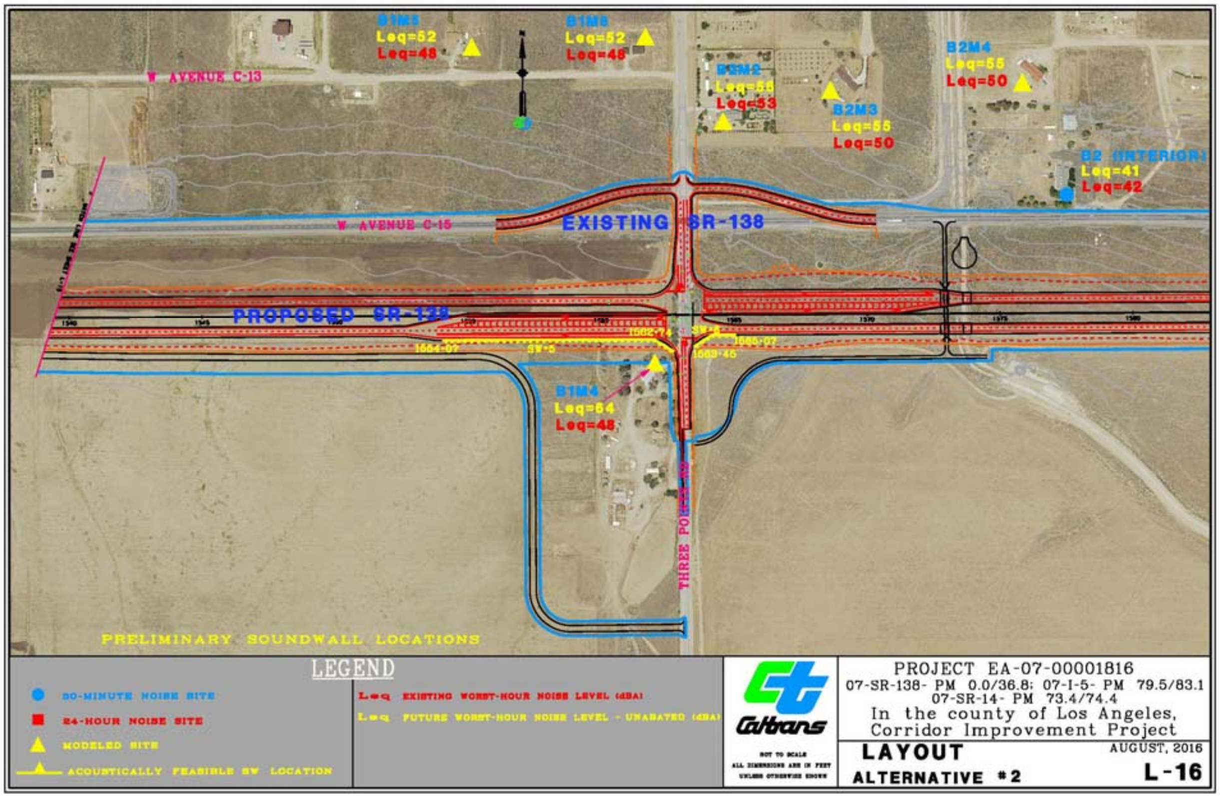


Figure 61: Alternative 2 Soundwall Location – 7 and 8 (sheet 1 of 2)

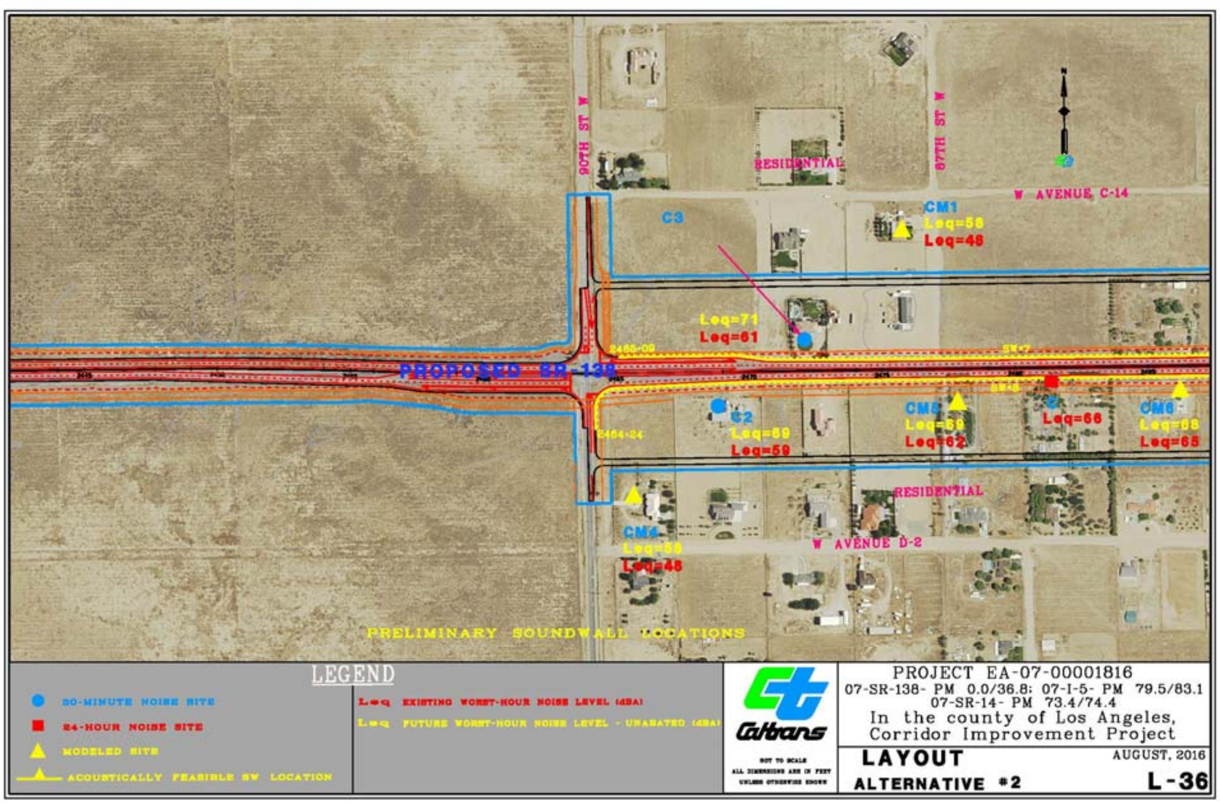


Figure 62: Alternative 2 Soundwall Location – 7 and 8 (sheet 2 of 2)

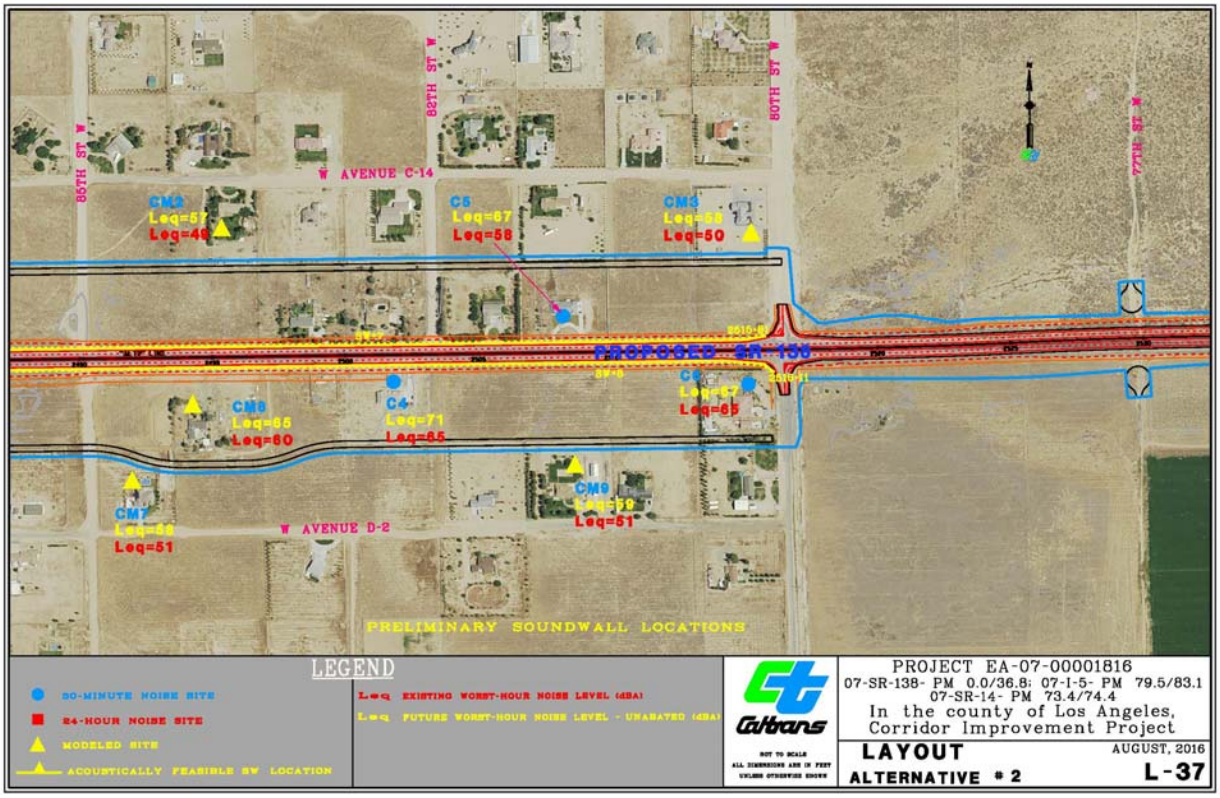


Figure 63: Alternative 2 (Roundabout) Soundwall Location – 7 and 8 (sheet 1 of 2)

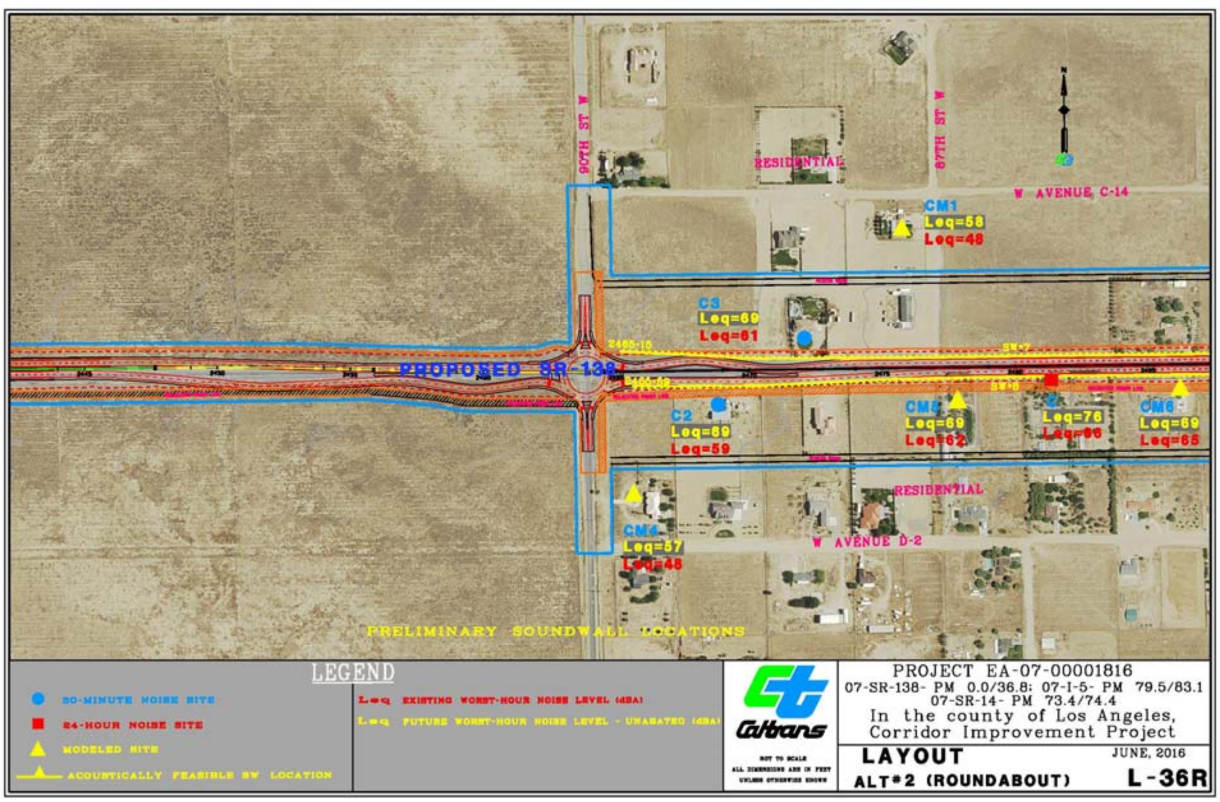
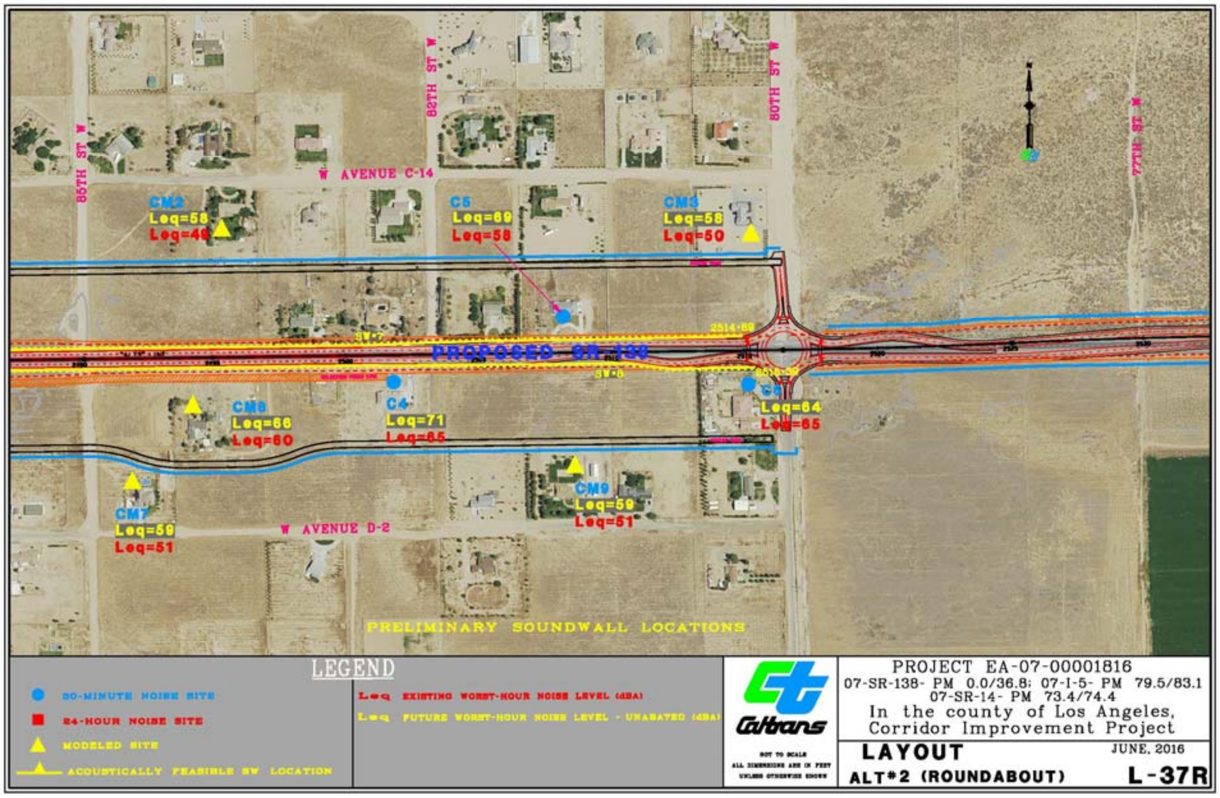


Figure 64: Alternative 2 (Roundabout) Soundwall Location – 7 and 8 (sheet 2 of 2)



NOISE-1: Control noise from construction activities in accordance with Caltrans Standard Specifications and Standard Special Provisions for "Noise Control."

NOISE-2: Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine enclosures, and engine vibration isolators intact and operational. Newer equipment would generally be quieter in operation than older equipment.

NOISE-3: Construction activities shall be limited to the hours specified by applicable local noise ordinances, Monday through Friday, excluding weekends and holidays. If construction is needed outside those hours, coordination with the affected local jurisdiction would be necessary.

See Chapter 4 for any Avoidance, Minimization, and/ or Mitigation measures that relate directly to CEQA.

3.2.8 ENERGY

Regulatory Setting

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

The California Environmental Quality Act (CEQA) Guidelines, Appendix F, Energy Conservation, state that EIRs are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Affected Environment

The following discussion incorporates the results of the *Energy Technical Report* completed for the project (Metro and Caltrans District 7, 2015).

Non-Renewable Energy Resources

Non-renewable energy resources include petroleum, natural gas, and coal. These energy resources are considered fossil fuels because they were formed when large quantities of dead organisms, usually zooplankton (microscopic organisms drifting in water bodies), algae, and other vegetation, were buried beneath sedimentary rock and exposed to intense heat and pressure over thousands of years. The age of the organisms and their resulting fossil fuels is typically millions of years, which is longer than human history. Therefore, fossil fuels are considered non-renewable resources because they cannot be replenished on a meaningful human timeframe. These resources would eventually run out because they cannot be renewed at a sufficient rate for sustainable economic extraction. The three main types of non-renewable energy resources, petroleum, natural gas, and coal, are described in further detail below.

Petroleum

Petroleum is a broad category that includes both crude oil and petroleum products, such as gasoline and diesel. Crude oil is a naturally occurring yellow-to-black liquid found in geological formations beneath the Earth's surface, and is a mixture of hydrocarbons, which are compounds of hydrogen and carbon. Crude oil is recovered mostly through oil drilling and is refined and separated into a large number of petroleum products.

California is one of the top producers of crude oil in the nation, accounting for more than seven percent of total United States (U.S.) production (U.S. Energy Information Administration, 2014a). Large crude oil reserves are located in geologic basins along the Pacific Coast and in the Central Valley. The most abundant oil-producing area is the San Joaquin basin in the southern half of the Central Valley. In addition, federal assessments indicate that there is potential for large undiscovered reserves of crude oil and natural gas in the federally administered Outer Continental Shelf; however, there is a permanent moratorium on offshore oil and gas leasing in state waters due to concerns regarding environmental impacts and risks of offshore oil and gas development. Petroleum consumption in California is shown in Table 91 below for the year 2012. The transportation sector accounted for approximately 86.29 percent of total consumption in the state.

Table 93: Petroleum Consumption in California in 2012

Sector	California Consumption	
	(Thousands of Barrels)	(Percent of Total California Consumption)
Residential	6,122	1.0
Commercial	6,301	1.0
Industrial	72,193	11.6
Transportation	535,174	86.3
Electric Power	423	0.1
Total	**620,214**	**100**

Source: U.S. Energy Information Administration, 2012

As petroleum is a non-renewable resource, it would not be replenished within a human lifetime. Fossil fuels are being rapidly depleted in the U.S., resulting in increased dependency on foreign sources of fuel. In addition, the burning of fossil fuels results in greenhouse gas (GHG) emissions, which has been linked to global climate change (changes in average weather conditions).

Natural Gas

Natural gas is a hydrocarbon gas mixture consisting primarily of methane, along with other gases in smaller quantities that include carbon dioxide, nitrogen, and hydrogen sulfide. Natural gas is often found in proximity to petroleum and coal in geological formations beneath the Earth's surface. Natural gas reserves are primarily in geologic basins in the Central Valley, the onshore coastal basins in northern California, and offshore along the southern California Coast. As stated above, however, there is a permanent moratorium on offshore oil and gas leasing in state waters due to concerns regarding environmental impacts and risks of offshore oil and gas development.

California production of natural gas accounts for a small percentage of total U.S. natural gas production and only satisfies about one-tenth of the state's demand for this energy resource (U.S. Energy Information Administration, 2014a). California imports 90 percent of its natural gas needs, mostly by interstate pipelines from the Southwest, Rocky Mountains, and Canada. Interstate pipelines bring natural gas from Arizona, Nevada, and Oregon to two natural gas trading centers: the Golden Gate Center in northern California and the California Energy Hub in southern California. As of July 2011, natural gas has arrived from Wyoming to Oregon through the Ruby Pipeline, and has added to natural gas supplies from Oregon to northern California. In addition, since 2008, California has been importing natural gas from Mexico's liquefied natural gas import terminal in Baja, Mexico. California also has more than a dozen natural gas storage fields to help stabilize the supply.

Natural gas consumption in California and Los Angeles County is shown in Table 94 below for the year 2013. Approximately 62 percent of natural gas consumption in the state is used for non-residential purposes. Los Angeles County's total natural gas consumption accounts for approximately 23.8 percent of total consumption in the state.

Table 94: Natural Gas Consumption in California and Los Angeles County in 2013

Sector	California Consumption		Los Angeles County Consumption	
	(Millions of Therms)	(Percent of Total California Consumption)	(Millions of Therms)	(Percent of California Consumption)
Non-Residential	8,156	62.0	1,809	22.2
Residential	4,991	38.0	1,322	26.5
Total	**13,147**	**100**	**3,131**	**23.8**

Source: CEC, 2013

Coal

Coal is a combustible black or brownish-black sedimentary rock found beneath the Earth's surface in layers called coal beds. Coal is composed primarily of carbon, along with varying quantities of other elements, including hydrogen, sulfur, oxygen, and nitrogen. Coal is extracted from the ground by coal mining, either underground by shaft mining, or at ground level by open pit mining extraction.

California has little or no coal reserves, and there is currently no coal production in the state. California has also been phasing out its use of electricity generated by coal-fired power plants, with only a few small coal-fired plants operating in California. Some coal is also consumed at industrial facilities. Almost all of the coal consumed in California is from coal mines in Utah and Colorado.

Coal consumption in California is shown in Table 95 below for the year 2013. The industrial sector accounts for approximately 77.7 percent of total consumption in the state, and electric power accounts for approximately 22.35 percent of total consumption.

Table 95: Coal Consumption in California in 2013

Sector	California Consumption	
	(Thousands of Short Tons)	(Percent of Total California Consumption)
Electric Power	398	22.4
Other Industrial	1,383	77.7
Total	1,781	**100**

Source: U.S. Energy Information Administration, 2013b

Renewable Energy Resources

Renewable energy is generally defined as energy that comes from resources that are naturally replenished on a human timescale. Renewable energy resources can be used without running out because these resources are continually replenished through natural processes. Sources of renewable energy include:

- **Wind:** Wind resources are found along the state's eastern and southern mountain ranges. Most of California's wind generation is found in the Tehachapi area of Kern County, with some large wind farms in Solano, Contra Costa and Riverside counties as well. California currently ranks second nationwide in terms of capacity, behind Texas and just ahead of Iowa (U.S. Department of Energy, 2015b).
- **Solar:** Solar energy is energy that is present in sunlight. High solar energy potential is found in southeastern California deserts. In addition, California leads the nation in the number of homes that have solar panels installed, totaling over 230,000 (Halper, 2014).

- **Hydroelectric Power**: Hydroelectric power (i.e., electricity generated through the gravitational force of falling or flowing water) is the dominating renewable energy source in the country. California alone has 287 hydroelectric generation plants (CEC, 2015c).

- **Geothermal Energy**: Geothermal energy is energy from the heat of the Earth. Substantial geothermal resources exist in the coastal mountain ranges and in the volcanic areas of northern California, as well as along the state's borders with Nevada and Mexico. The most developed of the high-temperature geothermal resource areas in the state is the Geysers. Located north of San Francisco, the Geysers was first used as geothermal resource in 1960. Other major geothermal energy production locations in the state include the Salton Sea area in Imperial County, the Coso Hot Springs area in Inyo County, and the Mammoth Lakes area in Mono County (CEC, 2015b).

- **Biomass**: Organic matter (also referred to as biomass), includes crops, animal waste, and municipal solid waste, and can serve as sources of renewable energy, called biofuels. California currently imports corn crops from the Midwest region of the U.S. to produce biofuels. However, the passage of AB 523 in August 2012 eliminated any state funding to support corn ethanol (a type of biofuel), prompting some producers to change feedstocks to other starchy crops, such as sorghum. In addition, sugar cane crops from the Imperial Valley have also been used as sources of biofuels (California Council on Science and Technology, 2013).

Renewable energy consumption in California by resource type is shown in Table 96 below for the year 2012. Hydroelectric power and biomass are the largest renewable energy resources consumed in the state, at 31.0 and 33.9 percent of total consumption, respectively.

Table 96: California Consumption of Renewable Energy Resources in 2012

Renewable Energy Source	California Consumption	
	(Trillion British Thermal Units (Btu))	(Percent of Total California Consumption)
Hydroelectric Power	255	31.0
Biomass	280	33.9
Other Renewable Sources	290	35.1
Total	**825**	**100**

Source: U.S. Energy Information Administration, 2012

Renewable energy can replace fossil fuels in four areas: motor vehicle fuels, electricity generation, hot water/space heating, and rural (off-grid) energy services. Electricity generation and motor vehicle fuels are described in more detail below.

Electricity

California has an electricity generation system that generates more than 200,000 gigawatt-hours each year and is transported over the state's 32,000 miles of transmission lines (CEC, 2015a). However, California consumes much more electricity than it generates, and therefore, about one-fourth of California's electricity comes from other states in the Pacific Northwest (U.S. Energy Information Administration, 2014a).

Electricity can be made from renewable or non-renewable energy resources. California is among the top states in the nation, second after Washington, in net electricity generation from renewable resources. Approximately 20 percent of California's electricity is generated from renewable energy resources (CEC, 2014b). The California Renewable Portfolio Standard sets a goal of 33 percent of electricity generation from eligible renewable resources by 2020.

Electricity consumption in California and Los Angeles County is shown in Table 97 below for the year 2013. Approximately 68.3 percent of electricity consumption in the state is used for non-residential purposes. Los Angeles County's total electricity consumption accounts for approximately 24.4 percent of total consumption in the state.

Table 97: Electricity Consumption in California and Los Angeles County in 2013

Sector	California Consumption		Los Angeles County Consumption	
	(Millions of kilowatts per hour (kWh)	(Percent of Total California Consumption)	(Millions of KwH)	(Percent of California Consumption)
Non-Residential	190,353	68.3	48,654	25.6
Residential	88,328	31.7	19,456	22.0
Total	**278,681**	**100**	**68,110**	**24.4**

Source: CEC, 2013

Transportation Fuels

In California, transportation requires the most energy (approximately 38.1 percent in 2012) out of all the other end-use sectors (U.S. Energy Information Administration, 2014a). The high demand for transportation fuels in the state is due to the large number of major airports, military bases, and motorists, with more motor vehicles registered in California than in any other state. In addition, California has some of the longest commute times in the country because of high traffic congestion and the relatively long distances between homes and jobs.

Gasoline and diesel, which are fossil fuels, have been the predominant transportation fuels in the U.S., accounting for 96 percent of the state's transportation fuel consumption. California's fossil fuel consumption for the transportation sector is shown in Table 98 for the year 2012. Gasoline is the largest fossil fuel consumed in the state, at 60 percent of total fossil fuel consumption.

Table 98: Traditional Fuel Consumption in California for the Transportation Sector in 2012

Traditional Fuel Type	California Consumption	
	(Trillion British Thermal Units (Btu))	(Percent of Total California Consumption)
Natural Gas	28	1.0
Aviation Gasoline	2	.1
Distillate Fuel Oil	425	14.5
Jet Fuel	536	18.2
Liquefied Petroleum Gas	4	0.1
Lubricants	12	0.4
Gasoline	1,762	60.0
Residual Fuel Oil	167	5.7
Total Fossil Fuel Consumption	**2,937**	**100**

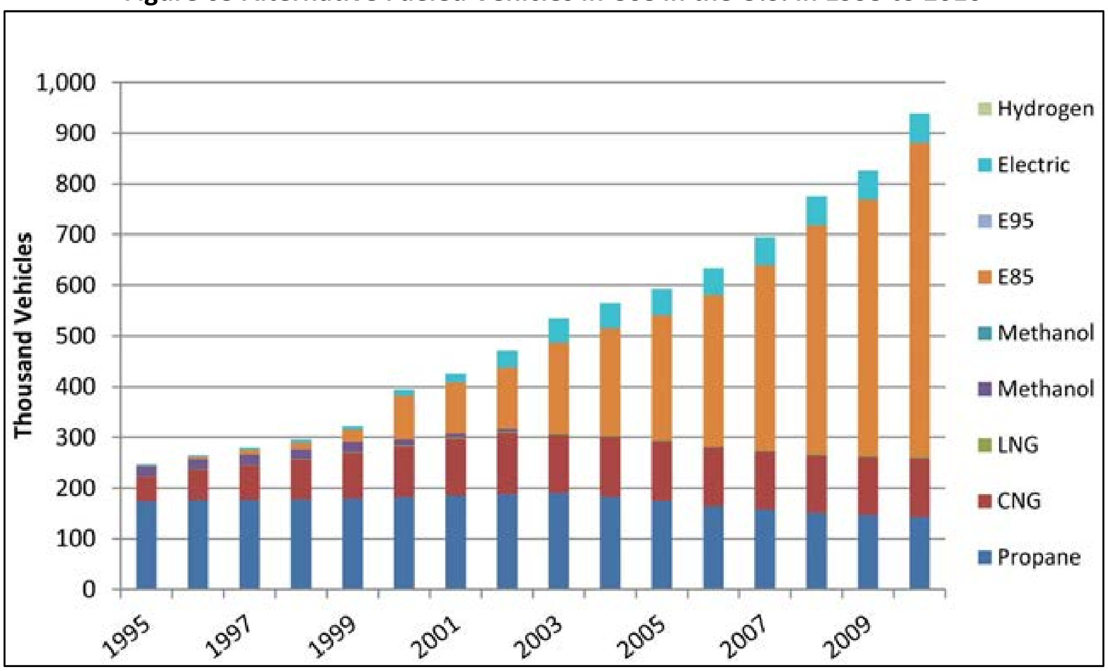
Source: U.S. Energy Information Administration, 2014b

Due to concerns about energy security and GHG emissions, other sources of motor vehicle fuels are being explored, including renewable fuels and alternative fuels. According to the U.S. Department of Energy, there are more than a dozen alternative fuels in production or under development for use. The increased use of renewable and alternative fuels can reduce dependence on foreign sources of crude oil because they are produced from domestic sources of energy. In addition, many renewable and alternative fuels result in substantially less GHG emissions compared to fossil fuels.

Though renewable fuels are also considered alternative fuels, the two terms have different meanings. Alternative fuels are generally alternatives to traditional gasoline and diesel fuels, and can include the fossil fuels, natural gas and liquefied petroleum gas (LPG)/propane, as well as renewable biofuels, which include biodiesel (vegetable-oil- or animal-fat-based diesel fuel) and alcohol (methanol, ethanol, and butanol) derived from crops, animal waste, or municipal solid waste. Other alternative fuels include electricity and hydrogen.

Although the use of renewable and alternative fuels accounts for only four percent of transportation fuels consumed in California, many programs and laws are being put into effect to promote the use of alternative fuel vehicles. Vouchers, rebates and high-occupancy vehicle (HOV) lane exemptions are some of the benefits of purchasing an alternative fuel vehicle. There are a growing number of alternative fuel vehicles in the state through the joint efforts of the CEC, CARB, local air districts, federal government, transit agencies, utilities, and other public and private entities. More than 61,000 cars, transit buses, and trucks currently operate on natural gas and LPG/propane, along with more than 10,000 electric vehicles (CEC, 2015). California also has hundreds of fueling stations dispensing a variety of non-petroleum fuels. Figure 65 and Figure 66 show that the use of alternative fueled vehicles and the consumption of most alternative fuels have risen steadily in the U.S. from 1995 to 2010.

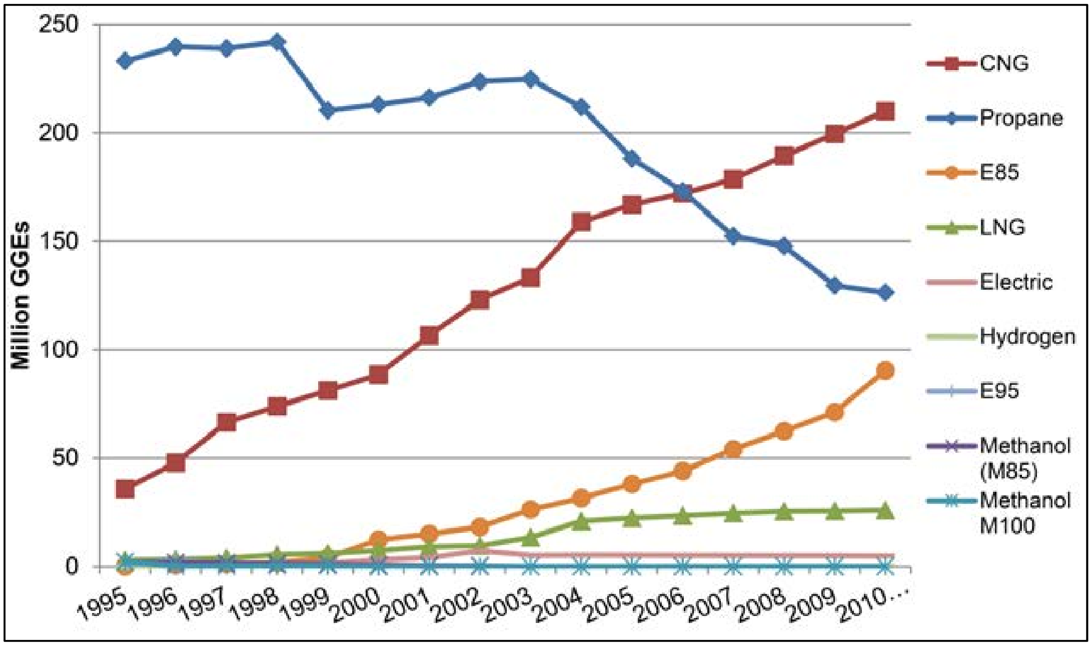
Figure 65 Alternative Fueled Vehicles in Use in the U.S. in 1995 to 2010



Source: U.S. Energy Information Administration, 2013a

Notes: E95=Blend of 95 percent (%) ethanol and 5% gasoline; E85=Blend of 85% ethanol plus 15% gasoline; LNG=Liquefied Natural Gas; CNG=Compressed Natural Gas

Figure 66 Alternative Fueled Vehicles in Use in the U.S. in 1995 to 2010



Source: U.S. Energy Information Administration, 2013a

Notes: CNG=Compressed Natural Gas; LNG=Liquefied Natural Gas; E85:=Blend of 85 percent (%) ethanol plus 15% gasoline; E95=Blend of 95% ethanol and 5% gasoline; M85=Blend of 85% methanol and 15% gasoline; M100=Blend of 98% methanol and 2% Tiande Brand methanol diesel additive

Environmental Consequences

The methodology used to perform the energy analysis is consistent with the methods described in Caltrans' *Standard Environmental Reference, Volume 1, Chapter 13 – Energy* (Caltrans, 2015). This methodology involves the analysis of direct energy use, indirect energy use, and service parameters. Direct energy use is the energy that is used to move a vehicle while using the project facility. Indirect energy use is the energy that is used for construction of the facility, and vehicle manufacturing and maintenance. Service parameters measure the actual use of energy compared to the potential energy use. Potential service of a vehicle would be the maximum rated capacity for passengers or cargo, and actual service is the real number it does carry.

The study area for this analysis includes the SR-138 corridor from I-5 to SR-14. Energy impacts were assessed for the study area, as well as for a larger regional area to determine the project's contribution to cumulative energy impacts. The main regional area used to assess the project's impacts encompasses the northern portion of Los Angeles County, including the Cities of Lancaster, Palmdale, and Santa Clarita; and the southern portion of Kern County.

Regional data for the construction of transportation projects was readily available for Los Angeles County only; therefore, the project's impacts on the indirect energy used for construction are compared to Los Angeles County. This difference in the regional area is noted within the appropriate sections below.

CARB's EMFAC 2014 model was used to estimate the average annual gallons per mile of gasoline and diesel for on road vehicles for the existing year 2013 and future year 2035 under all of the project alternatives.

Fehr & Peers provided existing year 2013 and future year 2035 vehicle miles traveled (VMT) for each Alternative for the study area, as well as the regional area (northern portion of Los Angeles County, including the Cities of Lancaster, Palmdale, and Santa Clarita; and the southern portion of Kern County). This data is shown in Table 99and Table 100 below. The annual VMT was calculated by multiplying the daily VMT by 290 days per year (an average number of days provided in the Caltrans' *Energy and Transportation Systems Handbook* to reflect 52 weeks per year, with a typical work week of 5.5 days per week, plus four holidays). This annual VMT data is shown in Table 97 and Table 98 below.

Table 99: Annual VMT for the Study Area

Scenario	Annual VMT (Millions of Miles)
2013 Existing Year	3
2035 No-Build Alternative	149
2035 Alternative 1 (Freeway/Expressway)	467
2035 Alternative 2 (Expressway/Highway)	444

Notes: Derived from daily VMT data provided by Fehr & Peers, 2013; VMT=Vehicle Miles Traveled

Table 100: Annual VMT for the Regional Area

Scenario	Annual VMT (Millions of Miles)
2013 Existing Year	14,926
2035 No-Build Alternative	23,080
2035 Alternative 1 (Freeway/Expressway)	23,074
2035 Alternative 2 (Expressway/Highway)	23,072

Notes: Derived from daily VMT data provided by Fehr & Peers, 2013; VMT=Vehicle Miles Traveled;
Regional Area=Northern Los Angeles County and Southern Kern County

Caltrans' *Energy and Transportation Systems Handbook* (Caltrans, 1983) provided average indirect energy use factors for construction of the highway, and the manufacturing and maintenance of vehicles based on industry standards.

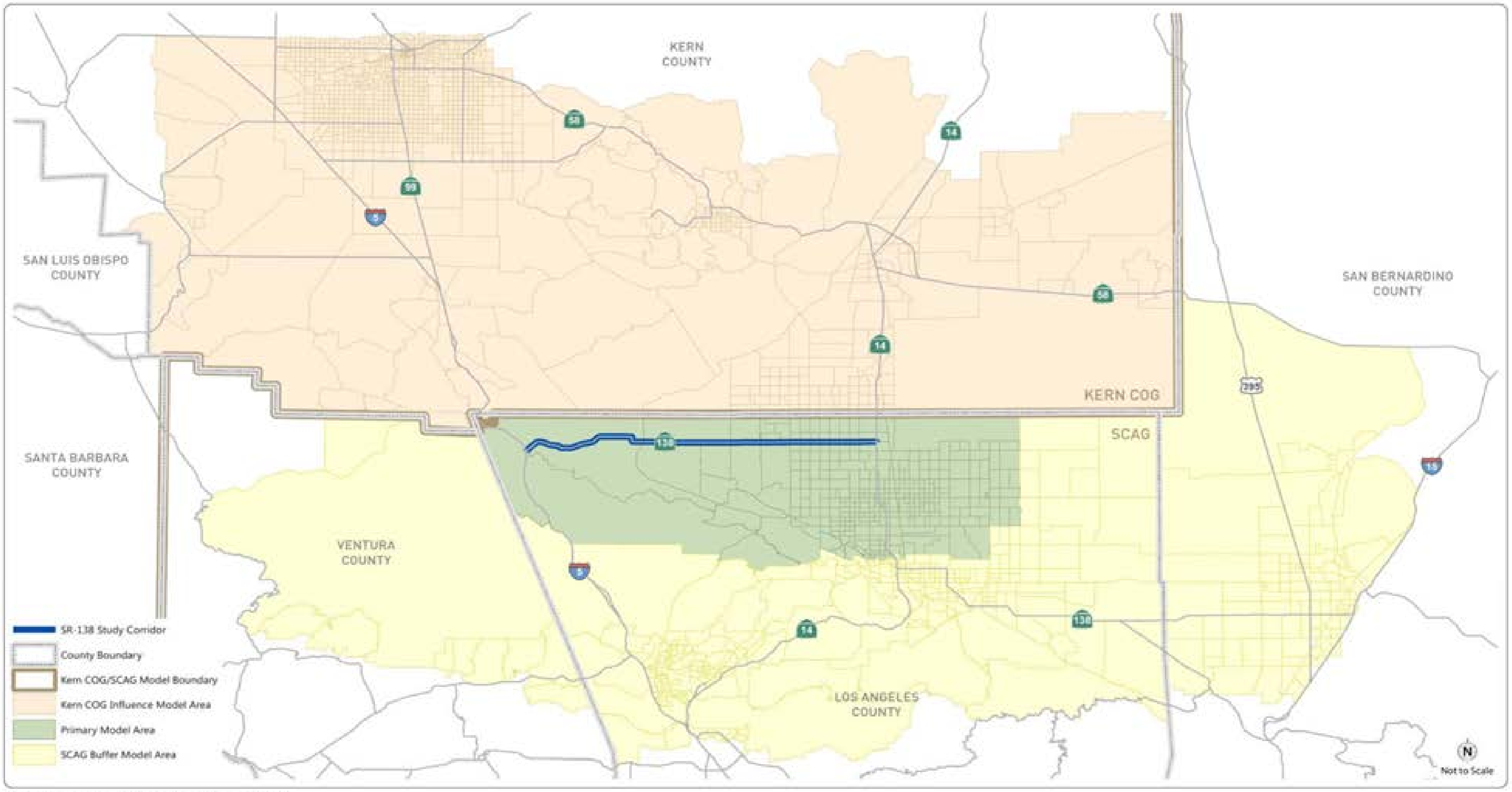
<u>Temporary Indirect Energy Impacts</u>

Short- Term Construction Impacts

Temporary indirect energy is the energy used to construct the project facility, as well as the energy used to manufacture the vehicles that would be using the facility. This section includes a discussion of temporary indirect energy impacts from construction of the facility; the temporary indirect energy used to manufacture vehicles is discussed in the Long-term Operational Impacts section.

The calculations for the temporary indirect energy used for construction are based on construction costs for each of the alternatives and other projects in the regional area, as well as the indirect energy use factor to construct a rural conventional highway provided in Caltrans' *Energy and Transportation Systems Handbook* (Caltrans, 1983).

Figure 67 Regional Location Map



Source: Fehr & Peers, 2014

No-Build Alternative
Under the No-Build Alternative, no construction would take place in the study area; therefore, there would be no temporary indirect impacts in the study area related to construction, as shown in Table 101.

In the regional area, it was assumed that other transportation projects in Los Angeles County would still be constructed under the No-Build Alternative; therefore, at the regional level, the amount of temporary indirect energy used for construction would increase substantially (by 88,945 percent) under the future year 2035 No-Build Alternative compared to the existing year 2013, as shown in Table 102.

Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway/Limited Access Conventional Highway)
As shown in Table 101, Alternative 1 would result in the greatest impacts on temporary indirect energy use in the study area for the future year 2035, compared to Alternative 2. As shown in Table 102 there would be no substantial differences in temporary indirect energy use at the regional level between the build alternatives and the No-Build Alternative. Based on this data, the build alternatives would not substantially contribute to indirect energy use at the regional level, and would not be expected to result in temporary adverse indirect energy impacts.

Indirect Energy for Vehicle Manufacturing
Temporary indirect energy is the energy used to construct the project facility, as well as the energy used to manufacture the vehicles that would be using the facility during long-term operation of the project. This section discusses the temporary indirect energy used to manufacture vehicles that would be using the facility during project operation; the temporary indirect energy used for construction is discussed in the Short-Term Construction Impacts section. The calculations for the indirect energy used to manufacture the vehicles using the facility are based on VMT data provided by Fehr & Peers (Fehr & Peers, 2013) and the indirect energy use factor from Caltrans' *Energy and Transportation Systems Handbook* (Caltrans, 1983).

No Build Alternative
For the temporary indirect energy used for manufacturing, the energy use under the future year 2035 No-Build Alternative would be approximately 5,380 percent higher than existing year 2013 in the study area (shown in Table 101), and 54 percent higher than existing year 2013 at the regional level (shown in Table 102), as a result of population growth. The No-Build Alternative serves as a baseline for comparison against the build alternatives, discussed below.

Table 101: Temporary Indirect Energy Use in the Study Area

Scenario	Indirect Energy for Construction (Billion Btu)	Indirect Energy for Manufacturing (Billion Btu)	Total Temporary Indirect Energy (Billion Btu)	% Change from 2013 Existing Year	% Change from 2035 No-Build Alternative
2013 Existing Year	0	5	5	--	--
2035 No-Build Alternative	0	274	274	5,380	--
2035 Alternative 1 (Freeway/Expressway)	36,596	858	37,454	748,980	13,569
2035 Alternative 2 (Expressway/Highway)	30,969	817	31,786	635,620	11,501

Source: GPA Consulting, 2015

Notes: Btu=British thermal unit; %=Percent

Table 102: Temporary Indirect Energy Use in the Regional Area

Scenario	Indirect Energy for Construction [1] (Billion Btu)	Indirect Energy for Manufacturing [2] (Billion Btu)	Total Indirect Energy Use (Billion Btu)	% Change from 2013 Existing Year	% Change from 2035 No-Build Alternative
2013 Existing Year	186,000	27,448	213,448	--	--
2035 No-Build Alternative	465,000	42,445	507,445	138	--
2035 Alternative 1 (Freeway/Expressway)	501,596	42,434	544,030	155	7
2035 Alternative 2 (Expressway/Highway)	495,969	42,429	538,398	152	6

Source: GPA Consulting, 2015

Notes: Btu=British thermal unit; %=Percent

[1] For construction energy, the regional area is Los Angeles County.

[2] For manufacturing energy, the regional area is northern Los Angeles County and southern Kern County.

Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway/Limited Access Conventional Highway)

Alternative 1 would result in the greatest impacts on temporary indirect energy use in the study area for the future year 2035, compared to Alternative 2. There would be no substantial differences in temporary indirect energy use at the regional level between the build alternatives and the No-Build Alternative. Based on this data, the build alternatives would not substantially contribute to indirect energy use at the regional level, and would not be expected to result in temporary adverse indirect energy impacts.

Permanent Indirect Energy Impacts

Permanent indirect energy is the energy used to maintain the vehicles that would be using the facility. The calculations for permanent indirect energy use presented below are based on the VMT data provided by Fehr & Peers (Fehr & Peers, 2013) and the indirect energy use factors provided in Caltrans' *Energy and Transportation Systems Handbook* (Caltrans, 1983).

No-Build Alternative

Tables 103 and 104 show that under the future year 2035 No-Build Alternative, permanent indirect energy use in the study area and regional area would not increase compared to existing year 2013. The No-Build Alternative serves as a baseline for comparison against the build alternatives, discussed below.

Table 103: Permanent Indirect Energy Use in the Study Area

Scenario	Indirect Energy for Facility Maintenance[1] (Billion Btu)	Indirect Energy for Vehicle Maintenance[2] (Billion Btu)	Total Permanent Indirect Energy Use (Billion Btu)	% Change from 2013 Existing Year	% Change from 2035 No-Build Alternative
2013 Existing Year	5,910,080,000	6	5,910,080,006	--	--
2035 No-Build Alternative	5,910,080,000	319	5,910,080,319	0	--
2035 Alternative 1	17,730,240,000	1,001	17,730,241,001	200	200
2035 Alternative 2	17,730,240,000	954	17,730,240,954	200	200

Source: GPA Consulting, 2015 Notes: Btu=British thermal unit; %=Percent

Table 104: Permanent Indirect Energy Use in the Regional Area

Scenario	Indirect Energy for Facility Maintenance (Trillion Btu)	Indirect Energy for Vehicle Maintenance[2] (Trillion Btu)	Total Permanent Indirect Energy Use (Trillion Btu)	% Change from 2013 Existing Year	% Change from 2035 No-Build Alternative
2013 Existing Year	11,547,220,300	32	11,547,220,332	--	--
2035 No-Build Alternative	11,547,220,300	49	11,547,220,349	0	--
2035 Alternative 1	11,559,040,460	49	11,559,040,509	0	0
2035 Alternative 2	11,559,040,460	49	11,559,040,509	0	0

Source: GPA Consulting, 2015 Notes: Regional Area=Northern Los Angeles County and Southern Kern County; Btu=British thermal unit; %=Percent

1 *For facility maintenance energy, the regional area includes the SCAG and Kern COG planning areas.*

2 *For vehicle maintenance energy, the regional area is northern Los Angeles County and southern Kern County.*

Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway/Limited Access Conventional Highway

Tables 105 and 106 above show that the future year 2035 Build alternatives would result in an increase in permanent indirect energy use of 200 percent in the study area compared to existing year 2013 and the future year 2035 No-Build Alternative. The build alternatives would result in negligible changes in permanent indirect energy use in the region compared to existing year 2013 and the future year 2035 No-Build Alternative.

Based on this data, the build alternatives would not substantially contribute to direct energy use at the regional level, and would not be expected to result in permanent adverse indirect energy impacts.

Permanent Direct Energy Impacts

Permanent direct energy use is the energy that is used to move a vehicle while using the project facility. The calculations for direct energy use are presented below and are based on gasoline and diesel usage provided by CARB's EMFAC 2014 model, and VMT data provided by Fehr & Peers.

No-Build Alternative

As shown in Table 105 below**,** for the future year 2035 No-Build Alternative, direct energy use in the study area would increase substantially (by 4,297 percent) compared to existing year 2013 as a result of projected population growth. As shown in Table 106, direct energy use in the regional area would increase by 29 percent from the existing year 2013 to future year 2035 under the No-Build Alternative. The No-Build Alternative serves as a baseline for comparison against the build alternatives.

Table 105: Percent Change in Direct Energy Use for the Study Area

Scenario	Btu (Billion)	% Change from 2013 Existing Year	% Change from 2035 No-Build Alternative
2013 Existing Year	73	--	--
2035 No-Build Alternative	3,201	4,297	--
2035 Alternative 1	10,042	13,692	214
2035 Alternative 2	9,564	13,035	192

Source: GPA Consulting, 2015

Notes: Btu=British thermal unit; %=Percent

Table 106: Percent Change in Direct Energy Use for the Regional Area

Scenario	Btu (Billion)	% Change from 2013 Existing Year	% Change from 2035 No-Build Alternative
2013 Existing Year	348,828	-	-
2035 No-Build Alternative	496,738	29	-
2035 Alternative 1	496,612	29	0
2035 Alternative 2	496,551	29	0

Source: GPA Consulting, 2015

Notes: Regional Area=Northern Los Angeles County and Southern Kern County; Btu=British thermal unit; %=Percent; *conversion factors of 143,700 Btu per gallon for gasoline, and 147,600 Btu per gallon of diesel were used to convert gallons of fuel to Btu*

Alternative 1 (Freeway/Expressway) and Alternative 2 (Expressway/Limited Access Highway)
Table 105 shows that future year 2035 build alternatives would result in substantial increases in direct energy use in the study area compared to existing year 2013, with an increase of 13,692 percent under Build Alternative 1, and 13,035 percent under Build Alternative 2. Compared to the future year 2035 No-Build Alternative, energy use under Build Alternatives 1 would be 214 percent higher, and Build Alternative 2 would be 192 percent higher in the study area in future year 2035.

As shown in Table 106, however, the build alternatives would result in negligible changes in direct energy use in the region compared to the No-Build Alternative in future year 2035. Based on this data, the build alternatives would not substantially contribute to direct energy use at the regional level, and would not be expected to result in adverse direct energy impacts.

Service Parameters
When looking at the potential energy consumption of Alternative 1 and Alternative 2, and what is actually consumed, the travel demands of the study area must be considered. The maximum rated capacity is used to determine the potential capacity (i.e., service) a vehicle can carry, while the actual service is the real number it genuinely carries. A delivery truck can be filled when traveling in one direction, but after the load is delivered, the truck would be empty upon the return. The truck has the potential to be full on both the delivery and the return trips, but in reality, it is only to capacity for half of the round trip. This same scenario is true for a personal vehicle with the potential to carry five people; in reality, this vehicle may only carry one out of five of the potential capacity on a regular basis. This is taken into consideration through a ratio called the “load factor.” The “load factor” is used when analyzing energy by taking the actual service versus the potential service.

The purpose of the project is to effectively and efficiently provide accommodations to the travel demands in the SR-138 corridor. Implementing these changes would not alter the potential transportation service versus actual transportation service within the study area or region; therefore, the project would have no adverse effects on service parameters.

Consistency with Energy Conservation Plans
In 2003, California adopted the *State of California Energy Action Plan* that established shared goals between the CEC, the California Public Utilities Commission (CPUC), and the Consumer Power and Conservation Financing Authority (called the CPA, which is now defunct). The goals of the energy action plan included specific actions to ensure adequate, reliable, and reasonably-priced electrical power and natural gas supplies through policies and strategies that are cost-effective and environmentally sound for California’s consumers and taxpayers (CEC, 2003). A second energy action plan was adopted by the CEC and the CPUC in 2005 to reflect policy changes and any changes that had taken place since 2003. The California Global Warming Solutions Act of 2006, also known as Assembly Bill 32, has influenced California policies as reflected in the *2007 Integrated Energy Policy Report* (IEPR). Updates are made to this report to allow the state to meet energy demands while addressing carbon constraints (CEC, 2007). California energy conservation is regulated for regional level impacts and not study area impacts. The Alternatives would be consistent with the *State of California Energy Action Plan* and the *2007 Integrated Policy Report* because the Alternatives would not result in substantial effects on the regional level. Therefore, Alternative 1 and Alternative 2 would not conflict with California’s energy conservation plans.

Cumulative Impacts

No-Build Alternative

The No-Build Alternative would not result in any temporary or long-term impacts related to energy; therefore, no cumulative impacts would result from this alternative.

Alternative 1 and Alternative 2

The cumulative setting is considered the northern portion of Los Angeles County, including the Cities of Lancaster and Palmdale; and the southern portion of Kern County. There are 36 transportation, energy, and residential/commercial development projects in the Cities of Lancaster and Palmdale, and unincorporated portions of Kern and Los Angeles Counties that are being planned, are under construction, or have been completed in the cumulative impact study area.

As discussed in this section, Alternative 1 and Alternative 2 would not substantially contribute to direct or indirect energy use at the regional level, and would not be expected to result in adverse direct or indirect energy impacts. Therefore, the project's contribution to cumulative energy impacts would be less than cumulatively considerable.

Avoidance, Minimization, and/or Mitigation Measures

Alternative 1 and Alternative 2 would not result in adverse effects related to energy consumption; therefore, no avoidance, minimization, or mitigation measures are required. The following measure is recommended to conserve energy during project construction:

ENERGY-1 As part of the Plans, Specifications, and Estimates (PS&E), a construction efficiency plan would be prepared, which may include the following:

- Reuse of existing rail, steel, and lumber wherever possible, such as for falsework, shoring, and other applications during the construction process.
- Recycling of asphalt taken up from roadways, if practicable and cost-effective.
- Use of newer, more energy-efficient equipment where feasible, and maintenance of older construction equipment to keep in good working order.
- Scheduling of construction operations to efficiently use construction equipment (i.e., only haul waste when haul trucks are full and combine smaller dozer operations into a single comprehensive operation, where possible).
- Promotion of construction employee carpooling.

3.3 BIOLOGICAL ENVIRONMENT

This section describes impacts to various biological resources as a result of the implementation of the Project. The focus of this section includes natural communities, wetlands and other waters, plant species, animal species, threatened and endangered species, and invasive species. Figure 69 presents the biological study area (BSA) used in describing the impacts to biological resources throughout this section.

3.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Wetlands and Other Waters are discussed in section 3.3.2. Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species section 3.3.5.

Regulatory Setting

Under Section 1802 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) has the jurisdiction over the conservation, protection, and management of native plants, and habitat necessary to maintain biological sustainable populations.

The Significant Ecological Area (SEA) Program is a regional conservation plan that designates certain areas within Los Angeles County as containing high levels of biological value. SEAs have been designated on land that is generally undisturbed or mildly disturbed, supports habitat for threatened species, contains corridors to promote species movement, and is large enough to support populations of these species. The Project crosses through two different SEAs, the San Andreas SEA and the Joshua Tree Woodlands SEA. Applicants wishing to develop projects within a designated SEA must present all proposed project plans, impacts and mitigation measures to the County's Significant Ecological Area Technical Advisory Committee (SEATAC) for approval. Although Los Angeles County and SEATAC have established guidelines for these areas, they are not a permitting authority over the proposed project.

Affected Environment

Information regarding natural communities was obtained from the Natural Environmental Study (NES). The Biological Study Area (BSA) includes the entire proposed thirty-six (36) mile project corridor and any area that would potentially be disturbed by the proposed project (approximately 4,536 acres). The BSA also includes any temporarily or permanently impacted areas for the purposes of construction access or storage areas, but does not include any off-site locations for detention basins or borrow sites as these will be determined after the environmental document phase. The proposed project corridor is located within multiple United States Geological Survey (USGS) 7.5-minute topographical quadrangles; Black Mountain, Fairmont Butte, La Liebre Ranch, Lebec, Little Buttes, Neenach School and Rosemond. The BSA varies in width from the existing SR-138 centerline from approximately 580 feet (ft) to 1,730 ft wide. western portion of the BSA is located at the convergence of the San Gabriel and Tehachapi Mountains, which is an important corridor for wildlife moving between these mountain ranges.

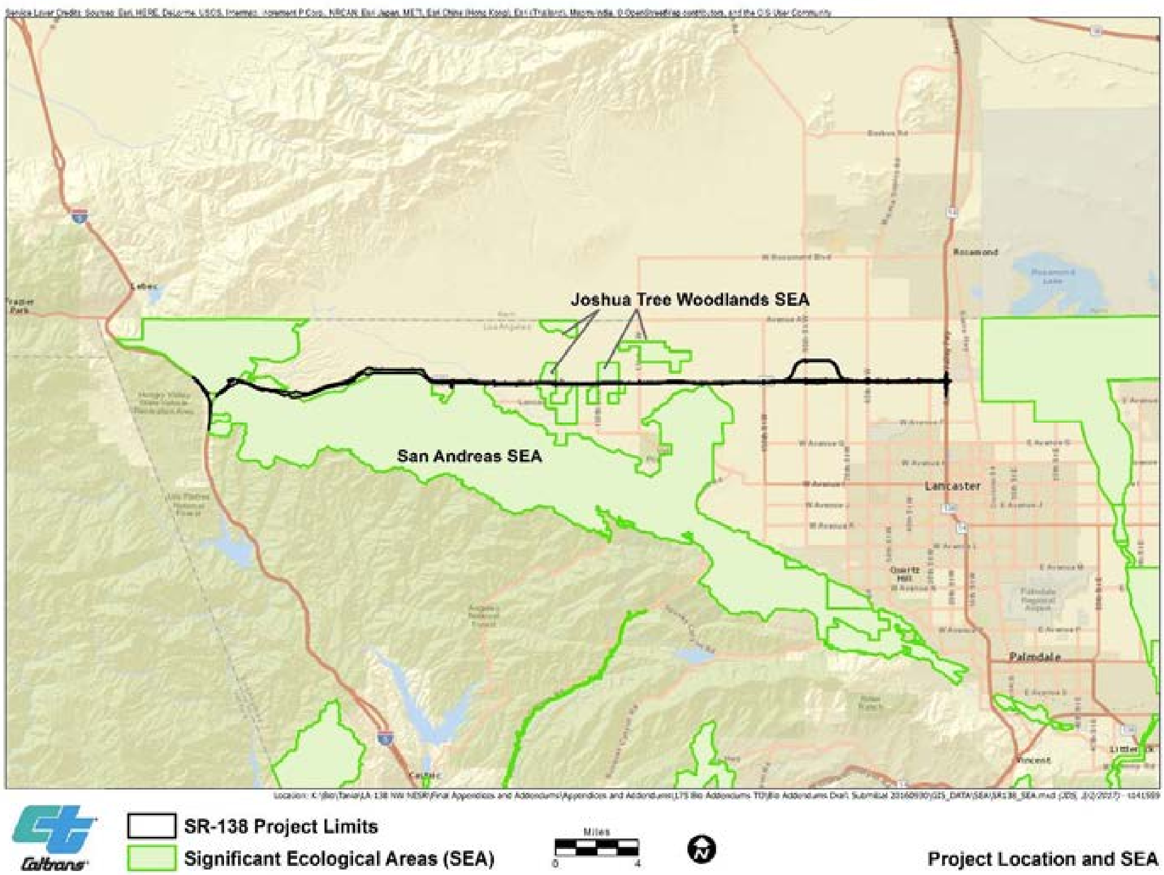
The Antelope Valley is recognized by California Audubon as a Globally Important Bird Area (IBA), one of 424 in the world. The Antelope Valley is visited by thousands of migrant birds during the spring and fall migratory seasons and is considered a part of the Pacific Flyway. It is an important stop along a major migrant route for songbirds, raptors and other sensitive species, and provides wintering habitat for large flocks of various songbirds and raptors such as mountain plovers, mountain bluebirds, vesper sparrows, horned lark, tricolored blackbirds, and ferruginous hawks.

The Joshua Tree Woodlands SEA is located in the western portion of the Antelope Valley, and northwest of the Antelope Valley California Poppy Reserve. This SEA is located along SR-138 between 170th and 190th Street West. This SEA consists of gradual slopes of high elevation desert areas ranging from 2,500 to 4,000 ft (762 m to 1,219 m) above MSL, and supports numerous old-growth stands of Joshua Trees (PCR Services Corporation 2000b). Joshua tree woodland habitat has become very fragmented in this area due to residential and agricultural development (County of Los Angeles 2015). The Joshua Tree Woodlands SEA provides habitat for migratory birds, reptiles, and small mammals.

The San Andreas Rift Zone SEA is also located in the western Antelope Valley. Several diverse habitats occur in this SEA, including those found in the Antelope Valley, Tehachapi Mountains, California Coastal Mountains, California Central Valley, and San Gabriel Mountains. The convergence of these five substantial ecoregions is not only biologically important due to the diversity of habitats present, but also represents an important area in southern California for wildlife linkages throughout and between these various habitats. Specifically, this SEA includes linkages between the Coastal Ranges, the San Gabriel Mountains, and the Tehachapi Mountains, which provides movement corridors for large mammals as well as topographic reference points and high altitude foraging grounds for migratory birds (County of Los Angeles 2015). The Project crosses through and abuts the San Andreas SEA in several places, mostly in the western portion (see Figure 68; County of Los Angeles General Plan, 2009).

A total of twenty-three (23) different plant communities and land cover types were identified within the Biological Study Area (BSA). The boundaries of the vegetation communities were drawn on the field maps by hand and were then digitized into a Geographic Information System (GIS) to create the vegetation map. Vegetation community type descriptions followed the designations in Sawyer *et al.* (2009) and Holland (1986). Please refer to the Vegetation Mapping Report found in Appendix G of the NES for further details. The predominant plant communities found within the BSA were fallow agriculture, allscale (*Atriplex polycarpa*) scrub and rubber rabbitbrush (*Ericameria nauseousa*) scrub. These communities intergraded frequently with several other vegetation communities, including: California juniper (*Juniperus californica*) woodland, big sagebrush (*Artemisia tridentata*), and cheatgrass (*Bromus tectorum*) grassland, Joshua tree woodland, Fremont cottonwood (*Populus fremontii*) forest, black willow (*Salix gooddingii*) thickets, and sandbar willow (*Salix exigua*) thickets. Other riparian communities present in the BSA include mulefat thickets and baltic/Mexican rush marshes. For detailed descriptions of the vegetation communities and land cover types, please refer to the NES and Appendix G – the Vegetation Mapping Report.

Figure 68 Project Location and San Andreas SEA



Sensitive Plant Communities

In the neighboring quads, the CNDDB literature review identified 12 vegetation communities that are considered special-status habitats or sensitive natural communities: canyon live oak ravine forest, coastal and valley freshwater marsh, southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern mixed riparian forest, southern riparian forest, southern riparian scrub, southern sycamore alder riparian forest, southern willow scrub, valley needlegrass grassland, valley oak woodland, and wildflower field. Sensitive natural communities include those designated as "high priority for inventory" by CDFW (2010) or that have a rarity rank of G1 to G3 (globally vulnerable or vulnerable across its entire range) or S1 to S3 (vulnerable at the state level even though it may be more secure elsewhere).

Although there are 12 vegetation communities found in the quad search, surveys conducted within the BSA found only the following sensitive plant communities:Joshua tree woodland and sensitive riparian communities present in the western portion of the BSA, which include Fremont cottonwood (*Populus fremontii*) forest, black willow (*Salix gooddingii*) thickets, sandbar willow (*Salix exigua*) thickets. Baseline acreages for each of these communities were mapped within the BSA as follows: 15.17 acres of Joshua tree woodland, 2.97 acres of Fremont cottonwood, 1.06 acres of black willow thickets, and 1.24 acres of sandbar willow thickets. The three riparian communities (Fremont cottonwood, black willow thickets, and sandbar willow thickets) are equivalent to the California Department of Fish and Wildlife (CDFW) sensitive communities of southern cottonwood willow riparian forest and southern willow scrub. Due to the high biological value and the sensitive classification of these plant communities, they will be discussed in further detail along with avoidance, minimization and mitigation measures. Below lists the vegetation communities, land cover types and acreages found within the BSA.

Figure 69 Biological Study Area (BSA)

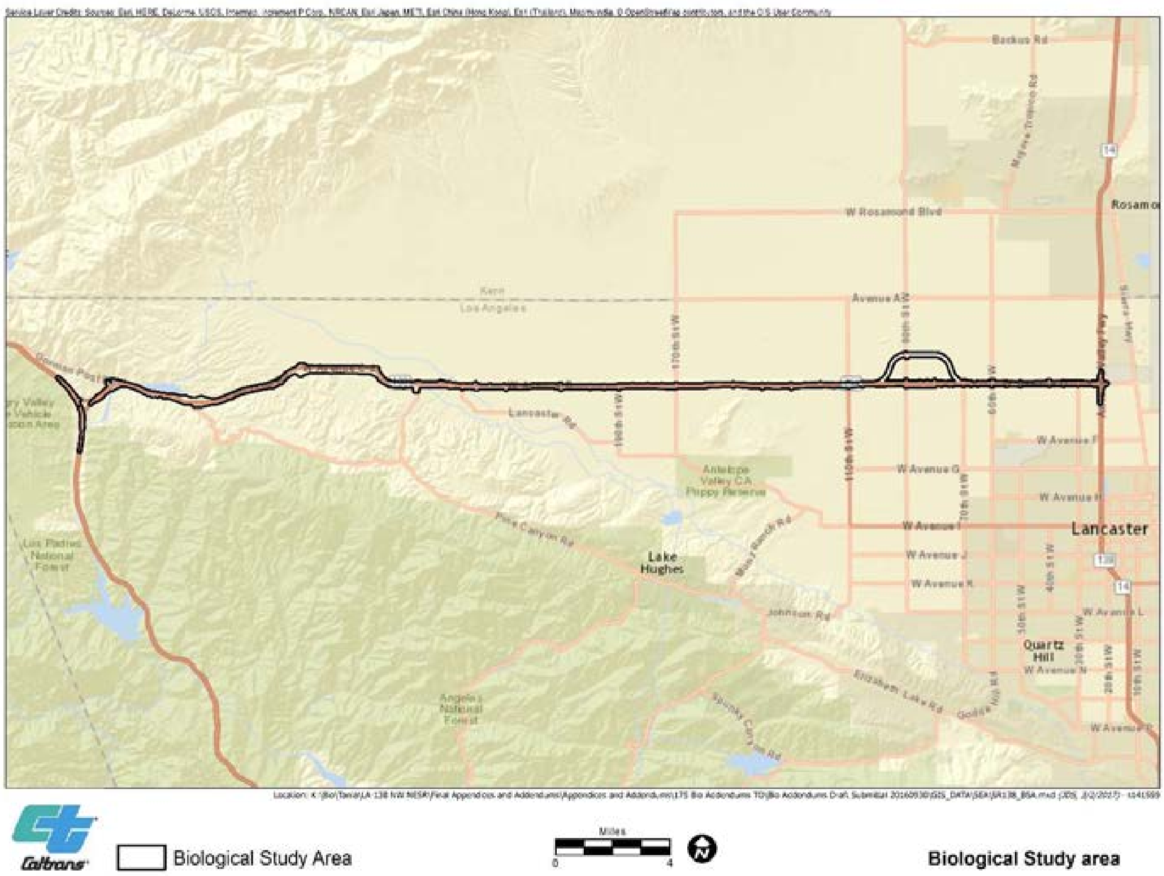


Table 107: Baseline Acreages of Vegetation Communities and Land Cover Types by Acreage

Vegetation Community	Total Acreage in Project Corridor
Active Agriculture (A-AGR)	23.68
Allscale Scrub (AS)	84.79
Baltic/Mexican Rush Marshes (BMRM)	1.15
Big Sagebrush (BS)	2.45
Black Willow Thickets (BWT)*	1.06
California Buckwheat Scrub (CBS)	0.13
California Juniper Woodland (CJW)**	87.78
Cattail Marshes	0.24
Cheatgrass Grassland	304.64
Developed (DEV)	284.32
Disturbed (DIS)	234.82
Fallow Agriculture (F-AGR)	491.78
Fremont Cottonwood Forest (FCF)*	2.97
Interior Live Oak Woodland	6.12
Joshua Tree Woodland (JT)*	15.17
Menzie's Golden Bush Scrub	1.78
Mojave Mixed Woody Scrub (MMWS)	2.97
Mulefat Thickets (MT)	0.04
Native Annual-Dominated Cheatgrass Grassland	5.92
Open Water (WTR)	2.87
Pine Windrows (PW)	0.35
Rubber Rabbitbrush Scrub (RBS)	877.6
Sandbar Willow Thickets (SWT)*	1.24
Scrub Oak Chaparral (SOC)	2.76
Tamarisk Thickets (TT)	1.00
Total *Considered a Natural Community of Special Concern by CDFW (i.e., State Rank S1 – S3). **Considered a regionally sensitive vegetation community, not a CDFW protected vegetation community State Rank Threat Ranks:	2437.67

Source: Caltrans, Natural Environment Study Report, December 2016

Environmental Consequences

The following tables identify impacts to all vegetation communities and land cover types, separated by each Alternative.

Table 108: Vegetation Communities and Land Cover Types – Alternative 1 Impacts

BUILD ALTERNATIVE 1 – Freeway – Expressway			
Vegetation Communities and Land Use Types	**Permanent Acres**	**Temporary Acres**	**Total Acres**
Active Agriculture	20.45	2.66	23.11
Allscale Scrub	51.24	8.91	60.14
Baltic/Mexican Rush Marshes	0.72	0.43	1.15
Big Sagebrush Scrub	2.08	0.28	2.36
Black Willow Thickets*	0.87	0.20	1.06
California Buckwheat Scrub	0.00	0.13	0.13
California Juniper Woodland**	70.84	10.46	81.29
Cattail Marshes	0.24	0.00	0.24
Cheatgrass Grassland	223.21	61.74	284.95
Developed	160.60	86.73	247.33
Disturbed	162.58	41.35	203.93
Fallow Agriculture	271.45	133.62	405.07
Fremont Cottonwood Forest*	2.72	0.26	2.97
Interior Live Oak Woodland	4.74	0.31	5.06
Joshua Tree Woodland*	13.71	1.03	14.74
Menzies's Golden Bush Scrub	0.45	1.34	1.78
Mojave Mixed Woody Scrub	1.67	1.30	2.97
Mulefat Thickets	0.00	0.04	0.04
Native Annual-Dominated Cheatgrass Grassland	0.00	0.00	0.00
Open Water	0.95	1.16	2.12
Pine Windrows	0.13	0.22	0.35
Rubber Rabbitbrush Scrub	551.35	209.51	760.86
Sandbar Willow Thickets*	0.98	0.26	1.24
Scrub Oak Chaparral	2.73	0.03	2.76
Tamarisk Thickets	0.35	0.00	0.35
TOTAL	**1544.05**	**561.98**	**2106.02**

* Considered a Natural Community of Special Concern by California Department of Fish and Wildlife (i.e., State Rank of S1 – S3).

**Considered a regionally sensitive vegetation community, not a CDFW protected vegetation community

<u>State Rank Threat Ranks:</u> 0.1: Very Threatened; 0.2: Threatened; 0.3: No Current Threat Known.

Source: Caltrans, Natural Environment Study Report, December 2016

Table 109: Vegetation Communities and Land Cover Types – Alternative 1 with Antelope Acres

BUILD ALTERNATIVE 1 WITH DESIGN OPTION 1 – Antelope Acres Bypass			
Vegetation Communities and Land Use Types	**Permanent Acres**	**Temporary Acres**	**Total Acres**
Active Agriculture	20.45	2.66	23.11
Allscale Scrub	49.04	8.01	57.05
Baltic/Mexican Rush Marshes	0.72	0.43	1.15
Big Sagebrush Scrub	2.08	0.28	2.36
Black Willow Thickets*	0.87	0.20	1.06
California Buckwheat Scrub	0.00	0.13	0.13
California Juniper Woodland	70.84	10.46	81.29
Cattail Marshes	0.24	0.00	0.24
Cheatgrass Grassland	223.21	61.74	284.95
Developed	146.09	72.53	218.62
Disturbed	178.34	43.81	222.15
Fallow Agriculture	285.41	123.05	408.45
Fremont Cottonwood Forest*	2.72	0.26	2.97
Interior Live Oak Woodland	4.74	0.31	5.06
Joshua Tree Woodland*	13.71	1.03	14.74
Menzies's Golden Bush Scrub	0.45	1.34	1.78
Mojave Mixed Woody Scrub	1.67	1.30	2.97
Mulefat Thickets	0.00	0.04	0.04
Native Annual-Dominated Cheatgrass Grassland	0.00	0.00	0.00
Open Water	0.95	1.16	2.12
Pine Windrows	0.00	0.14	0.14
Rubber Rabbitbrush Scrub	572.23	211.45	783.68
Sandbar Willow Thickets*	0.98	0.26	1.24
Scrub Oak Chaparral	2.73	0.03	2.76
Tamarisk Thickets	0.96	0.05	1.00
TOTAL	**1578.43**	**540.65**	**2119.08**
* Considered a Natural Community of Special Concern by California Department of Fish and Wildlife (i.e., State Rank of S1 – S3). **Considered a regionally sensitive vegetation community, not a CDFW protected vegetation community <u>State Rank Threat Ranks:</u> 0.1: Very Threatened; 0.2: Threatened; 0.3: No Current Threat Known.			

Source: Caltrans, Natural Environment Study Report, December 2016

Table 110: Vegetation Communities and Land Cover Types – Alternative 2 Impacts

BUILD ALTERNATIVE 2 – Expressway - Conventional Highway			
Vegetation Communities and Land Use Types	**Permanent Acres**	**Temporary Acres**	**Total Acres**
Active Agriculture	20.40	2.70	23.10
Allscale Scrub	35.98	8.64	44.62
Baltic/Mexican Rush Marshes	0.72	0.43	1.15
Big Sagebrush Scrub	0.90	1.46	2.36
Black Willow Thickets*	0.87	0.20	1.06
California Buckwheat Scrub	0.00	0.13	0.13
California Juniper Woodland**	57.76	10.30	68.06
Cattail Marshes	0.24	0.00	0.24
Cheatgrass Grassland	176.40	73.80	250.21
Developed	158.38	105.24	263.61
Disturbed	131.03	46.20	177.23
Fallow Agriculture	240.89	154.37	395.26
Fremont Cottonwood Forest*	2.72	0.26	2.97
Interior Live Oak Woodland	4.75	0.31	5.06
Joshua Tree Woodland*	6.52	1.19	7.71
Menzies's Golden Bush Scrub	0.45	1.34	1.78
Mojave Mixed Woody Scrub	1.67	1.30	2.97
Mulefat Thickets	0.00	0.04	0.04
Native Annual-Dominated Cheatgrass Grassland	0.00	0.00	0.00
Open Water	0.95	1.16	2.11
Pine Windrows	0.07	0.21	0.29
Rubber Rabbitbrush Scrub	436.79	243.37	680.16
Sandbar Willow Thickets*	0.98	0.26	1.24
Scrub Oak Chaparral	2.73	0.03	2.76
Tamarisk Thickets	0.28	0.17	0.45
TOTAL	**1281.50**	**653.11**	**1934.60**

* Considered a Natural Community of Special Concern by California Department of Fish and Wildlife (i.e., State Rank of S1 – S3).
**Considered a regionally sensitive vegetation community, not a CDFW protected vegetation community
<u>State Rank Threat Ranks:</u>
0.1: Very Threatened; 0.2: Threatened; 0.3: No Current Threat Known.

Source: Caltrans, Natural Environment Study Report, December 2016

Southern Cottonwood Willow Riparian Forest and Southern Willow Scrub Communities

Fremont cottonwood forest, black willow thickets, and sandbar willow thickets are all plant communities that have been observed within the BSA and are communities that belong to both southern cottonwood willow riparian forest and southern willow scrub communities. All alternatives, including the Preferred Alternative (Alternative 2) have the potential to permanently impact 4.57 acres and temporarily impact 0.72 acres of southern cottonwood willow riparian forest and southern willow scrub, which are considered sensitive by CDFW. Through the implementation of avoidance and minimization measures listed below, and replanting efforts, impacts to this plant community will be reduced.

Joshua Tree Woodland

The proposed project has the potential to impact Joshua tree woodland, which is considered sensitive by CDFW. A total of 14.74 acres are located within Alternative 1 and Alternative 1 with Antelope Acres, and a total of 7.71 acres are located within Alternative 2, the Preferred Alternative. These numbers are the combined total of both permanent and temporary impacts. Although individual Joshua trees are not considered to be special-status by California Department of Fish and Wildlife, they serve an important biological function and visual feature of the Mojave Desert. Individual tree calculations were determined after a Joshua tree inventory was conducted within the BSA and a total of 639 individual Joshua trees were present within the 15.17 acres of Joshua tree woodland. Through implementation of avoidance and minimization measures listed below, and replanting efforts, impacts to this plant community will be reduced. This plant community typically occurs on gently sloped alluvial fan areas. It was characterized by dense overstory (at least 10% cover) of Joshua trees up to 39 feet in height, which may be associated with many different understory shrub communities (Sawyer *et. al*. 2009). A small area of Joshua tree woodland was located along northbound I-5 at the western end of the BSA. The remaining area of Joshua tree woodland occurs where the LA County Joshua tree woodland SEA was documented between 170th and 190th Street West. The dominant plant species observed in the Joshua tree woodland included: big sagebrush, rubber rabbitbrush, and bladderpod. Non-native herbaceous species were observed in the understory of this community, including foxtail brome, and cheatgrass.

California Juniper Woodland

The proposed project has the potential to impact California juniper woodland. A total of 81.29 acres are located within Alternative 1 and Alternative 1 with Antelope Acres, and a total of 68.06 acres are located within Alternative 2, the Preferred Alternative. These calculations are the combined total of both permanent and temporary impacts. California juniper woodland is not considered a special status natural community by CDFW, however this community serves as an important biological function to various common and sensitive animal species. Additionally, California junipers have an extremely slow growth cycle and the time to reach maturity can easily be 100 years depending on physical conditions. It is important to note that the California juniper woodland within the BSA overlapped with Joshua tree woodland, a sensitive plant community. Due to the density of junipers being higher when compared to the density of Joshua trees in the same area, the vegetation community defaulted to California juniper woodland. Because of this factor, and the above rationale, impacts to this regionally important resource should be treated as a sensitive plant community and appropriate avoidance and minimization and mitigation measures should be implemented. Through the implementation of avoidance and minimization measures listed below, and replanting efforts, impacts to this plant community will be reduced.

Wildlife Movement and Habitat Connectivity

A wildlife corridor study was conducted in 2014-2015. Twenty areas/stations were determined to be high use areas within the Project corridor. All stations exhibiting an occurrence per day number of 0.30 or higher were generally determined to be "high use" areas within the Project corridor. This would be the equivalent of a target mammal traveling through an area approximately once every three days or roughly twice a week. The locations and direction of travel of incidentally observed target species were also assessed to determine if there were additional areas within the Project corridor that were not studied that could possibly be considered high use areas.

Table 111: Wildlife High Use Areas

Station Number	Number Occurrences	Number Survey Days	Number Occurrences per Survey Day	Species	Habitat/ Topography	Area within Project Corridor
T-60	21	20	1.05	Coyote	Cheatgrass grassland/ dirt road (160th Street West).	East
T-18	18	20	0.90	Coyote, Raccoon	Rabbitbrush scrub/ road shoulder west of California Aqueduct and Quail Lake.	West
T-06	8	10	0.80	Coyote, Bobcat	Rabbitbrush scrub/ box culvert and associated drainage.	West
C-38	12	17.75	0.68	Coyote, Black-tailed Jackrabbit	Allscale scrub/ box culvert and associated drainage running east-west under SR-14.	East
C-37	10	15	0.67	Coyote, Desert Kit Fox, Black-tailed Jackrabbit	Allscale scrub/ drainage channel running north-south.	East
T-09	13	20	0.65	Coyote, Black-tailed Jackrabbit	Mojave mixed woody scrub/ adjacent to fenced drainage blocked with vegetation. Hole in chain-link fence provides north-south crossing opportunity in this area.	West
T-61	12	20	0.60	Coyote	Rabbitbrush scrub/ dirt road (165th St W).	East

Station Number	Number Occurrences	Number Survey Days	Number Occurrences per Survey Day	Species	Habitat/ Topography	Area within Project Corridor
T-21	8	20	0.40	Coyote	Rabbitbrush scrub/ road shoulder south of entrance to Quail Lake.	West
T-54	8	20	0.40	Coyote, Mule Deer, Black-tailed Jackrabbit	Rabbitbrush scrub/ dirt road southeast of the intersection between 210th Street West and SR-138.	East
T-71	8	20	0.40	Coyote, Bobcat, Black-tailed Jackrabbit	Allscale scrub/ box culvert and associated drainage running east-west under SR-14.	East
C-35	5	12.5	0.40	Coyote, Black-tailed Jackrabbit	Rabbitbrush scrub/ dirt road (165th St W).	East
C-32	6	15.5	0.39	Coyote, Desert Kit Fox, Black-tailed Jackrabbit	Allscale scrub/ large concrete pipe and associated drainage west of SR-14.	East
C-41	3	8.25	0.36	Coyote	Rabbitbrush scrub/ no linear features; open habitat.	East
T-11	7	20	0.35	Coyote	Mojave mixed woody scrub/ at the base of a hillside in the shoulder of SR-138.	West
T-63	7	20	0.35	Coyote	Rabbitbrush scrub/ dirt road (130th Street West).	East
C-02	5	16.25	0.31	Coyote, Bobcat	Sandbar willow thickets, large culvert and associated drainage running north-south.	West
C-13 / C-14 / C-19 / C-20 / T-30A	20	65.75	0.30	Coyote, Mountain Lion, Bobcat	Rabbitbrush scrub/ box culvert and associated drainage running north-south.	West

Station Number	Number Occurrences	Number Survey Days	Number Occurrences per Survey Day	Species	Habitat/ Topography	Area within Project Corridor
T-27	6	20	0.30	Coyote, Mule Deer	Rabbitbrush scrub/ dirt road south of residences at southeastern side of Quail Lake.	West
T-64	6	20	0.30	Coyote, Bobcat, Desert Kit Fox	Fallow agriculture and rabbitbrush scrub/ dirt road (105th Street West).	East
T-68	6	20	0.30	Coyote, Desert Kit Fox, Black-tailed Jackrabbit	Allscale scrub/ dirt road (35th Street West).	East
T-03*	3	20	0.15	Coyote, bobcat, mountain lion	Rabbitbrush scrub/ drainage channel west of I-5. *Although not classified as a high use area through data analysis, this channel was used by mountain lion for travel during winter survey, which could make this location important for mountain lion travel in the area.	West

Source: Caltrans, Natural Environment Study Report, December 2016

In general, there are specific factors that drive wildlife movement in any given area: topography, human activity, presence of domestic wildlife, vegetation/habitat changes, and presence of water features (drainages, permanent water sources, dry washes, etc.). The topography of the Project corridor in the western portion contains elevation changes, drainages and permanent bodies of water (Quail Lake, California Aqueduct, and a small pond south of Quail Lake), and varying habitats (vegetation communities) that may influence movement of wildlife in the region. Additionally, the convergence of montane habitats in this portion of the Project corridor likely increases the species diversity and frequency of wildlife moving throughout the area. Flat topography, monotypic vegetation, and anthropogenic disturbances largely comprise the eastern portion of the Project corridor. Based on these differences, it would be expected that the majority of wildlife movement would be documented in the western portion of the Project corridor; however, there were several areas in the eastern portion of the Project corridor that were considered high use areas for wildlife movement. It is likely that the increased density of residential and solar facilities, and subsequent increase of human and domestic animal activity, towards the eastern portion of the Project corridor may direct wildlife travel to or from certain areas. This could create something similar to a funnel effect one might see typically associated with varied terrain or drastic changes in habitat. With more urban development planned for the areas surrounding the eastern portion of the Project corridor, wildlife specific crossing structures may be very important for travel, gene dispersal, and overall survival of the large mammal species that inhabit the area. See Appendix J in the NES, the Wildlife Corridor Study Report, for further details.

Through consultation with CDFW, Caltrans determined the need for pronghorn (*Antilocapra americana*) spotting surveys due to the project's proximity to a known population within Tejon Ranch. These surveys were done in conjunction with the Wildlife Movement Survey. Six pronghorn spotting stations were established through the western end of the BSA. Pronghorns were neither observed nor detected during the visual observation periods.

The South Coast Missing Linkages analysis identified four missing linkages that cross the SR-138, including two in the west, one in the central portion of the Project corridor, and another in the east (South Coast Wildlands 2008; Penrod et al. 2000). These missing linkages do not provide specific locations for wildlife movement, but rather provide a large-scale analysis of connections between large, open space areas and mountainous regions. This analysis is not likely to provide specific information pertaining to the development of Project features that would facilitate wildlife movement, but points out that SR-138 in its current configuration may represent an impediment to wildlife movements and/or gene flow in the region. The South Coast Wildlands (2008) identified one opportunity for improving wildlife movements in the Project corridor that included the portion of I-5 north of the interchange with SR-138. Here the only structures that would allow movement of wildlife across I-5 are four culvert box structures that measure approximately 5 by 5 ft (1.5 by 1.5 m). They recommend that a larger, more porous structure, such as a bridge undercrossing or a vegetated overcrossing, be constructed here to allow for the passage of wildlife in this vicinity.

The California Essential Habitat Connectivity (CEHC) Project has identified the mountainous areas to the northwest, west, and southwest of the Project as being conducive to wildlife movement (i.e., there is less risk of mortality or energy expenditure for an animal to move through that area). There are identified landscape blocks that abut the western 1/3 of the Project corridor, but no connectivity corridors that intersect it.

The proposed project has the potential to directly or indirectly impact wildlife movement throughout the project limits. However, with the inclusion of the proposed avoidance and minimization measures, impact levels area expected to be relatively low.   Exact acres of impacts to wildlife corridors are unable to be quantified, and currently there is no real mechanism for compensatory mitigation for these types of impacts. However, due to the location of the BSA within known linkages, impacts to wildlife movement shall be avoided and mitigated for when necessary. Coordination and discussions will take place with CDFW and USFWS for compensatory mitigation for Joshua tree woodland, California juniper woodland, and sensitive riparian communities which are expected to offset any impacts to wildlife movement.

Caltrans has addressed the wildlife corridor issues within the scope of the project to the maximum extent practicable, prior to final design of the project. Caltrans will further address wildlife movement as further data is available and as the project footprint changes incrementally during the final design phase. In consultation with the resource agencies, the specific design of wildlife crossing structures will perform according to standards outlined in this memorandum, as additionally set forth in FHWA Wildlife

Crossing Structure handbook (2011) and in a manner as natural and easy for wildlife to cross such that they will promote use by local wildlife with consideration to current land use, approved projects within the area, and further coordination with CDFW and USFWS.

Indirect Effects

Indirect impacts on biological resources would occur to those natural habitats in surrounding areas immediately adjacent to the proposed project limits, after the completion of the proposed project. Any one of these topics or combination of two or more can be referred to as an "edge effect". Potential indirect impacts on biological resources associated with the proposed project include:

- Increased light and glare
- Increased noise
- Vibration
- Increase in populations of non-native plants
- Increase in vehicle/wildlife collisions and kills
- Increase in human presence and development
- Habitat alteration
- Fugitive dust

These impacts have the potential to degrade adjacent habitat with an edge effect.

- Light and Glare

Development of the site has the potential to increase the nighttime light and glare sources on the site when compared to current levels. Nighttime illumination is known to adversely affect some species of wildlife in natural areas. It can disturb breeding and foraging behavior and potentially alter breeding cycles of birds, mammals, and nocturnal invertebrates. In addition, light could deter some animal species, especially the larger mammals, from using rivers, creeks, and washes as a movement corridor. If uncontrolled, such lighting where proximal to these movement corridors, could adversely impact the composition and behavior of the wildlife that occur in these areas. This indirect impact is considered moderate compared to the current illumination of the highway. With the implementation of the proposed mitigation measures BIO-22 and BIO-23, the level of indirect impacts to wildlife due to lighting and glare is expected to be low.

- Ambient Noise Levels

The existing ambient noise levels measured along SR-138 were between 52 and 66 decibels (dBA) depending on the geographic features along the existing highway. The future noise levels have been predicted to increase up to 75 dBA. Caltrans proposes to construct numerous sound wall barriers to reduce future noise levels by 7dB to current conditions. With these sound wall barriers it is expected that activities of noise-sensitive wildlife would be nominally impacted by noise levels during regular operation of the widened SR-138.

- Construction Noise Levels

Equipment involved in construction is expected to generate noise levels ranging from 70 to 90 dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6 dBA per doubling of distance. Normally, construction noise levels should not exceed 85 dBA at a distance of 50 feet. With the implementation of the proposed mitigation measures, indirect impacts to nocturnal wildlife activities caused by construction noise are expected to be low.

- Vibration

Larger vehicles such as semi-trucks currently travel along SR-138 and generate vibrations. As such, vibrations would attenuate over a short distance and are not expected to affect wildlife within the crossings or beyond the immediate road shoulder. Therefore, indirect impacts to wildlife due to vibration are expected to be low.

Vibrations would be generated by equipment during the construction phase of the project. Certain heavy equipment is known to cause vibrations when operating such as pile drivers, dozers, and large excavators. It is assumed that this equipment would have a need to operate within all areas of the disturbance envelope, including the margins of the project nearest the adjacent open space and natural washes. It is the operation of heavy equipment in these areas that have the potential to substantially affect the movement of wildlife species. With the implementation of the proposed mitigation measures, indirect impacts to nocturnal wildlife activities caused by construction equipment vibrations are expected to be low.

Cumulative Impacts

The BSA for plant communities is within the Antelope Valley watershed and the Gorman Creek subwatershed of the Santa Clara River watershed. Although the Antelope Valley and the Fremont Valley are separated by a topographic and hydrologic divide in the Antelope Valley, they are often referred to collectively as the Antelope-Fremont Valleys watershed. The proposed project area traverses approximately thirty-six (36) miles of the Antelope Valley region, ending within the Tehachapi Mountains at the western end. The project corridor is situated on the north side of the San Gabriel Mountains, largely within the Antelope Valley that comprises the western Mojave Desert, and south of the Tehachapi Mountains. The majority of the eastern portion of the Project corridor largely comprises vegetation communities characteristic of the Mojave Desert, whereas the western one-third of the project corridor represents a transition zone between desert, foothill and montane environments.

The project corridor is largely situated in undeveloped areas within the Antelope Valley. Anthropogenic land uses and features in the vicinity of the project corridor include low-to-medium-density residential developments, ranches, agricultural croplands, solar energy facilities, and water aqueducts and reservoirs. Much of the area in the project vicinity primarily consists of farmlands and grazing lands. Residential development in the project vicinity is mostly scattered and low-density, with medium density located in Neenach and the community of Del Sur in northwestern Lancaster. There are also a number of open space areas in the vicinity of the project corridor.

Field surveys identified three CDFW sensitive communities that have the potential to be impacted with the proposed project. These communities include: southern cottonwood willow riparian forest, Joshua tree woodland, and southern willow scrub. Vegetation communities known to exist within the proposed project area (Fremont cottonwood forest, black willow thickets and sandbar willow thickets) are equivalent to the CDFW sensitive communities of southern cottonwood willow riparian forest and southern willow scrub. The proposed project area also includes California juniper woodland that is regionally recognized as a plant community with high habitat value.

Health and Historical Context

Western riparian ecosystems have been greatly altered by human activity. Riparian forests have been reduced to fragmented discontinuous patches because of human intervention. Many factors have contributed to these resource losses, including the following; natural resource use; urbanization; alteration of stream flows through dam construction and ground-water withdrawal; modification of biotic conditions through grazing, agriculture, and introduction of non-native species; and alteration within watersheds.

The Fremont cottonwood forest vegetation community occurs along streams and in canyons, with Fremont cottonwood being the dominant species. Often, Fremont cottonwood is found in pure stands, although minor stands of other riparian tree species can also occur. At the western end of the Project corridor study area, various levels of disturbance, such as trash dumping and off-road use, were present in the Fremont cottonwood forest and were likely due to the proximity to I-5. This community was also found scattered throughout the western portion of the study area in association with water features.

The Sandbar willow thicket vegetation community is found in floodplains, depositions along rivers and streams, and at springs. Sandbar willow is the dominant or co-dominant in the shrub canopy; emergent riparian trees may be present at low cover and the herbaceous layer is variable. Because the species is so widespread, it is an integral part of riparian systems throughout most of the state. Its colonizing and stabilizing characteristics make it an important member in the riparian disturbance cycle, and reduced flooding regularity has diminished its representation along some rivers and streams.

Development in the Antelope Valley during the 1980s destroyed an estimated 200,000 Joshua trees, inspiring land use reform in Lancaster and Palmdale. The Joshua Tree Woodlands Significant Ecological Area is located in the western portion of the Antelope Valley. Significant Ecological Areas (SEA) are officially designated areas within the County identified for their biological value. The Joshua Tree Woodlands SEA encompasses many of the remaining old-growth stands of Joshua trees (Yucca brevifolia) on the west side of the Antelope Valley. The SEA is located at least partially in each of the following USGS 7.5-minute topographical quadrangles: Neenach School, Fairmont Butte, Black Mountain, and Lebec. Joshua tree woodland is a complex biological community of the gradual slopes of higher elevation areas that once covered much of this part of the Antelope Valley around the Antelope Wash. Joshua trees only occur within the Mojave Desert, and Los Angeles County populations are at the western limit of the species' range. Because Joshua trees live in areas that are easily developed for residences and agriculture, this habitat has become very fragmented in the County. California juniper woodland forms a zonal belt on alluvial fans entering the Mojave Desert along the Tehachapi and Transverse Ranges. Extensive stands of California Juniper in the Antelope Valley of the western Mojave have been subjected to reduction from clearing for agriculture as well as fire.

The San Andreas Significant Ecological Area (SEA) is located in the western portion of the Antelope Valley, along with adjacent areas, and is identified in the County of Los Angeles *Antelope Valley Area Plan*. The San Andreas SEA includes several important linkages for wildlife movement. The foothills in the western-most part of the SEA are an important linkage between the San Gabriel Mountains, the Tehachapi Mountains, and the Coastal Ranges. The linkage to the Tehachapi Mountains is important because the Tehachapis connect to the southern-most extent of the Sierra Nevada Mountains. This feature may be an important topographic reference for migrating birds, and provides high elevation foraging grounds along the migratory route. The several ranges that meet at the western end of the SEA provide a valuable link for gene flow between divergent subspecies, varieties, and populations of many species.

Reasonably Foreseeable Actions and Their Impacts

Table 112 lists the past, current, and reasonably foreseeable projects that would directly or indirectly impact southern cottonwood willow riparian forest and southern willow scrub (Fremont cottonwood forest, black willow thickets, sandbar willow thickets), as well as Joshua tree woodland and/or California juniper woodland. Impact acreage associated with each project is listed, if available.

The past, present, and reasonably foreseeable actions listed in Table 112 could potentially impact all of the natural communities that would be potentially impacted by the proposed. All of the projects listed in Table 112 would incorporate avoidance, minimization and/or mitigation measures that would result in reduced or less than significant impacts to sensitive vegetation communities. With the use of avoidance and minimization measures, on-site mitigation plantings and the purchase of mitigation parcels it is anticipated at this time that this project would not result in a net loss of these sensitive plant communities.

On-site mitigation plantings within Caltrans ROW and off-site mitigations shall have a separate landscape contract with timelines that would be addressed in a subsequent HMMP (Habitat Mitigation Monitoring Plan). Revegetation success criteria and measures will be coordinated with resource agencies. These measures will reduce the project's contribution to cumulative impact when considering all past, current, and future development.

The Project corridor crosses through and abuts the San Andreas SEA in several places, mostly in the western portion of the Project area. Other reasonably foreseeable actions within the RSA that are located in the vicinity of the San Andreas SEA include the West Antelope Solar Project and the Centennial Specific Plan and Project.

Table 112: Reasonably Foreseeable Actions – Natural Communities

Project	Impact (acres)
California High Speed Train System	Southern Cottonwood Willow Riparian Forest Southern Willow Scrub
High Desert Corridor Project	Joshua Tree woodland (653 ac.) Fremont cottonwood forest (21.7ac.) Sandbar willow thickets (4.1 ac.)
AV Solar Ranch One	Joshua Tree Woodland (0.2 ac.)
Pacific Wind Energy	Joshua Tree Woodland (5 ac.)
Alta-Oak Creek Mojave	Joshua Tree Woodland
Alta Infill II	Joshua Tree Woodland
Catalina Renewable Energy Project	Joshua Tree Woodland (.25 ac.)
Rising Tree Wind Farm	Joshua Tree Woodland (26 ac.) California Juniper Woodland (111ac.)

RE Distributed Solar Projects (RE Columbia One, Two, and Three)	Joshua Tree Woodland
Lower West Wind Energy Project	Joshua Tree Woodland
Alta East	Joshua Tree Woodland (max. 240 ac.) California Juniper Woodland (134 ac.)
Palmdale Hybrid Power Plant (PHPP)	Joshua Tree Woodland (189 ac.)
RE Garland Solar Project	Joshua Tree Woodland
RE Astoria Solar Project	Joshua Tree Woodland
Antelope Valley Public Landfill	Juniper/Joshua Tree Woodland (103 ac.)
Wildflower Green Energy Farm Project	Southern Willow Scrub (3.1 ac.)
Centennial Specific Plan and Project	Southern Cottonwood Willow Riparian Southern Willow Scrub

The West Antelope Solar Project would include the installation of chain-link fencing around the perimeter of the project site. There is no indication of concentrated movement through the project site or adjacent lands. The Project is not expected to affect regional wildlife movement or interfere substantially with the movement of any native resident or migratory fish and wildlife species in areas surrounding the site, nor would it impede the use of native wildlife nursery sites. The perimeter fencing would be raised above the ground at regular intervals, to ensure that small and medium sized wildlife would continue to be able to pass through the Project site unimpeded.

Development of the Centennial Specific Plan and Project is not expected to interfere with a majority of regional wildlife movement (1) based on the findings of independent studies that the project site is largely outside of the regional wildlife movement corridor; (2) since the site's feasibility to be utilized as part of a regional wildlife corridor between the Tehachapi Mountains (to the north) and the Angeles National Forest (to the south and west) is limited by the Aqueduct and I-5; and (3) because the majority of the site is open grassland and does not support the forest and shrub cover that many larger, wide-ranging species tend to use during movement episodes.

When combined with other approved projects in the region of the BSA, the cumulative effect on wildlife movement is expected to remain low. With the use of on-site design features, such as appropriately-sized culverts, it is not anticipated that the proposed project would result in a net loss of wildlife linkages or impede wildlife permeability. The avoidance, minimization, and/or mitigation measures identified in the section below would serve to minimize cumulative impacts discussed in this section to wildlife movement to the extent feasible.

As discussed above, the proposed project has measures incorporated to avoid, minimize and/or mitigate the project's potential effects to biological resources. Therefore, the proposed project is not anticipated to contribute to cumulatively considerable effects to biological resources.

Avoidance, Minimization, and/or Mitigation Measures

BIO-1 through **BIO-6** relate to Southern Cottonwood Willow Riparian Forest, Southern Willow Scrub, California juniper woodland, and Joshua tree woodland. All sensitive vegetation communities shall be will be designated as an Environmentally Sensitive Area (ESA) and have the following avoidance, minimization, and mitigation measures.

Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures with the guidance of CDFW staff. Section 3.3.6 addresses weed abatement plan measures as additional avoidance and minimization measures to offset impacts to these sensitive plant communities.

BIO-1: All sensitive vegetation communities shall be preserved in place. An approved biologist shall protect these vegetation communities by establishing an environmentally sensitive area (ESA) prior to the onset of ground disturbance, using brightly colored fencing and monitoring any clearing and grubbing related construction activities. An approved biologist and licensed arborist will oversee the placement and design of this fencing.

BIO-2: When impacts to these sensitive vegetation communities are unavoidable, trees and large shrubs shall be trimmed under the direction of a licensed arborist.

BIO-3: Standard BMPs will be implemented by Caltrans to protect ecologically important resources in the construction zone. General stormwater BMPs and conservation measures shall be implemented during project construction to avoid any potential for downstream sedimentation effects on all riparian habitat. The BMPs of the storm water pollution prevention plan (SWPPP) will be designed to avoid potential indirect effects to all riparian habitat.

BIO-4: Large trees and shrubs marked for removal shall be relocated to a nursery by a qualified arborist and preserved to be replaced on-site within Caltrans ROW once construction is complete. Joshua trees shall be relocated and/or transplanted between November and January using a 90 inch tree. Details regarding the relocation and replacement of sensitive vegetation will be covered under the Project's Habitat Mitigation and Monitoring Plan (HMMP). Native habitat will be revegetated on site in accordance with a HMMP that will be developed for the Project in coordination with CDFW and USFWS. If it is deemed that on-site revegetation within Caltrans ROW is not possible, then off-site mitigation shall be completed within the region and shall preserved in perpetuity. Efforts will be made to acquire lands adjacent to the project limits with equal habitat, equal hydrology, and equal soil conditions. Caltrans anticipates off-site mitigation for permanent impacts will be at least a 2:1 ratio and temporary impacts at least a 1:1 ratio for sensitive vegetation communities and shall be coordinated further with CDFW.

BIO-5: If on-site relocation of individuals or on-site plantings within Caltrans ROW are not possible for riparian habitat after construction is complete, off-site mitigation shall be completed and shall be coordinated with CDFW, USACE, and SWRCB DWQ. Efforts will be made to acquire riparian habitat within LA County's San Andreas Rift Zone SEA. Mitigation ratios for riparian habitat shall be determined in coordination with the appropriate regulatory agencies to assess the quantity and quality of the riparian habitat.

BIO-6: On-site mitigation plantings within Caltrans ROW shall have a separate landscape contract with timelines that would be addressed in a subsequent HMMP. Revegetation success criteria and measures will be coordinated with CDFW. On-site mitigation plantings shall be monitored by a qualified biologist seasonally to determine health and viability. Surveys shall be performed every few months within the 2 year plant propagation period. If it is determined that an on-site planting is in poor health, it shall be replaced by a healthy individual within 2 weeks and shall continue to be monitored during the 5 year monitoring period.

BIO-7 through **BIO-8** relate to wildlife movement. Impacts to wildlife movement should be minimized to the extent feasible through freeway design. The final project design shall include design features such as appropriate sized culverts to facilitate wildlife movement. The following measures, as well as further studies prior to construction are recommended.

BIO-7: Use wildlife underpasses or use large, at-grade culverts under the new freeway where drainages bisect the Project corridor. Wildlife species are more likely to utilize at-grade culverts during travel when they can see across to the other side. In addition, where the road may include medians requiring long culverts, the culverts shall be day lighted in the median to encourage wildlife travel and to allow vegetation to grow underneath the crossing (Penrod et al. 2012). Suitable habitat for local wildlife shall be preserved and/or constructed within and on either side of the crossing structure to promote wildlife use (Penrod et al. 2012). Examples of this include natural substrates, native vegetation, rocks, and other features similar to the surrounding areas.

a. In the western portion of the Project corridor, use of the existing culverts for wildlife travel has been well documented. It is recommended that these culvert locations be preserved and expanded in width so that they encourage and are more accommodating for wildlife travel. Culverts are not as abundant in the eastern portion of the Project corridor; therefore, it is more crucial to design and construct crossing structures in some of the high use areas in this area to prevent or substantially reduce collisions between vehicles and wildlife traveling across the freeway.

b. The following existing culverts are currently being used as wildlife crossings, T-06, C-38, T-09, T-71, C-02, C-24, C-13/C-14/C-19/C-20/T-30A, and shall be enhanced with appropriate substrate leading up to the culverts with ledges or small gravel to continue the use of the culverts for crossing beneath the widened highway.

c. Wildlife crossings at or adjacent to the following wildlife study stations, T-60, T-18, T-06, C-37, T-61, T-21, T-54, C-32, T-11, T-63, T-27, T-64, T-68 will be established to prevent collisions between vehicles and wildlife crossing the freeway.

d. When designing wildlife-specific crossing structures in the eastern portion of the Project corridor, research on the future plans for regional development north and south of SR-138 shall be conducted to ensure that the open areas on either side of the road connected by the crossing structure would not be developed in the near future. A crossing structure would be rendered relatively useless for large wildlife if the structure did not connect two areas of open land and native habitat on either side. Ideally, a crossing should connect two land areas that are permanently conserved or at least have plans in place for long-term conservation.

e. Bridges and culverts constructed to cross drainage features shall be constructed high enough and wide enough to allow large wildlife to travel underneath (Bank et al. 2002).

The freeway design shall also include culverts as crossing structures that are specifically designed for wildlife travel (Penrod et al. 2012).

f. Focus wildlife crossing structures on drainages, washes, canyons, gullies, and established dirt roads that cross the new freeway. It also may be more cost-effective for the Project and valuable to wildlife to focus the placement of wildlife crossings on or around the existing features utilized as travel routes (washes, canyons, gullies, drainages, and roads).

g. Vegetation in the immediate vicinity of wildlife crossing structures shall be maintained in a way that helps funnel wildlife through crossing structures and helps improve site distance and visibility for wildlife (Clevenger and Huijser 2011; Bank et al. 2002). An example of this would be maintaining denser vegetation near the crossing structure that guides wildlife away from traveling on or near roadways and into the crossing structure instead (Ascensao and Mira 2007).

h. Aprons of culverts shall be maintained to prevent scouring and hanging culverts, and shall be replaced with like materials. Vegetation at the aprons of culverts shall be cleared to maintain wildlife crossings.

i. Human activity shall be restricted in the vicinity of each crossing structure, especially at night, to further promote use of the crossing structure by wildlife (Clevenger and Huijser 2011).

j. One-way gates and ramps that provide escape routes for wildlife trapped on the freeway shall be included in the freeway design to further reduce wildlife-motorist collisions (Clevenger and Huijser 2011; Banff National Park of Canada 2002).

k. Install wildlife drift fencing along busy roadways with natural under- or over-crossings for wildlife. Fences shall be constructed of a chain-link fence from the project limits at I-5/SR-138 to 300th St and a mesh fence from 300th St to SR-14/SR-138. Heights of the fencing shall be at an appropriate height, at a minimum of 8 feet on flat ground, and at a minimum of 12 feet on slopes, and wings leading into each culvert or crossing to channel wildlife safely through the designated crossing areas (Penrod et al. 2012; Yanes et al. 1994). A portion of the fence should also be buried underground to prevent wildlife from digging underneath the fence (Clevenger and Huijser 2011). Additionally, fences should never be constructed in areas where they would block crossing features (Penrod et al. 2012; Yanes et al. 1994). Fencing should also be constructed in such a way that it helps funnel wildlife through crossing structures.

l. In areas where wildlife drift fencing terminates, care should be taken to design the fence termination at a wildlife crossing structure (Clevenger and Huijser 2011). If this is not feasible, fence terminations should be in areas where animals are not likely to travel across roadways, such as areas containing rugged terrain or high levels of human activity.

m. Wildlife fencing shall be maintained to ensure any damages or gaps are repaired to prevent wildlife from entering the freeway.

n. Human activity should be restricted in the vicinity of each crossing structure, especially at night, to further promote use of the crossing structure by wildlife (Clevenger and Huijser 2011).

BIO-8: Caltrans has identified 20 locations along SR-138 as potential wildlife crossings to mitigate for impacts to wildlife genetic diversity and wildlife movement. These 20 locations were evaluated and nine of these locations shown (Table 113) are feasible within the current project footprint. These sites include areas of road-related mortality provided by Caltrans data, local observations during biological surveys, local resident's concerns, and areas where land-use was compatible with the wildlife crossings locations such as adjacent known open space parcels and conservation parcels. The locations and design of crossing enhancements will be coordinated between Caltrans project team and resource agencies during final design. The specific design of wildlife crossing structures will perform according to standards outlined in this memorandum, as additionally set forth in the FHWA Wildlife Crossing Structure handbook (2011) and in a manner as natural and easy for wildlife to cross such that they will promote use by local wildlife.

Table 113: Summary of Proposed Wildlife Undercrossings on SR-138

Station	Species	Intersections/ Landmarks	Dimension of Undercrossing	Length (ft)
949+96	Deer	Gorman Post Road	8' Height x 45' Wide	350
1124+50	Coyotes, bobcats		72" RCP	210
1116+55	Deer	Telephone Road/Cement Road	15' Height x 45' Wide	180
1627+00	Deer	240th Street West to 300th Street West	15' Height x 45' Wide	180
1816+60	Coyotes, bobcats		72" RCP	118
2125+00	Coyotes, bobcats	155th Street West Joshua Tree Woodland SEA and San Andreas Rift Zone SEA	72" RCP	104
2238+20	Coyotes, bobcats		72" RCP	104
2562+10	Coyotes, bobcats		60' RCP	104
2590	Coyotes, bobcats		60' RCP	110

Source: Caltrans, Natural Environment Study Report, December 2016

BIO-9: Use lighting in areas only where necessary for safety and signage. Eliminate all lighting in other areas. All lighting should be downcast to minimize lighting of natural areas, particularly rivers, washes and drainages.

3.3.2 Wetlands and Other Waters

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practical alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or the Department, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCB) and the California Department of Fish and Wildlife (CDFW. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that would substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement would be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for more details.

Because this Project traverses two water quality control regions (Los Angeles and Lahontan) Section 401 of the Clean Water Act (CWA) is administered by the State Water Resources Control Board's Division of Water Quality (SWRCB DWQ). Section 401 requires that any applicant for a federal permit for activities that involve a discharge to waters of the United States (WUS) shall provide the federal permitting agency a certification from the state in which the discharge is proposed that states that the discharge will comply with applicable provisions under the CWA. Section 401 Water Quality Certification is required for discharges to activities regulated by the U.S. Army Corps of Engineers (USACE) under Section 404. SWRCB DWQ jurisdiction typically matches the USACE jurisdictional boundaries for WUS mapped at the ordinary high water mark (OHWM). In areas where USACE does not take jurisdiction, the SWRCB DWQ delineates Waters of the State of California (WSC) based on geomorphic flow indicators. In addition, a Waste Discharge Requirement (WDR) pursuant to the California Code of Regulations (CCR) title 27 requirements may be required for discharges to land with a low threat to water quality in non-federal WSC.

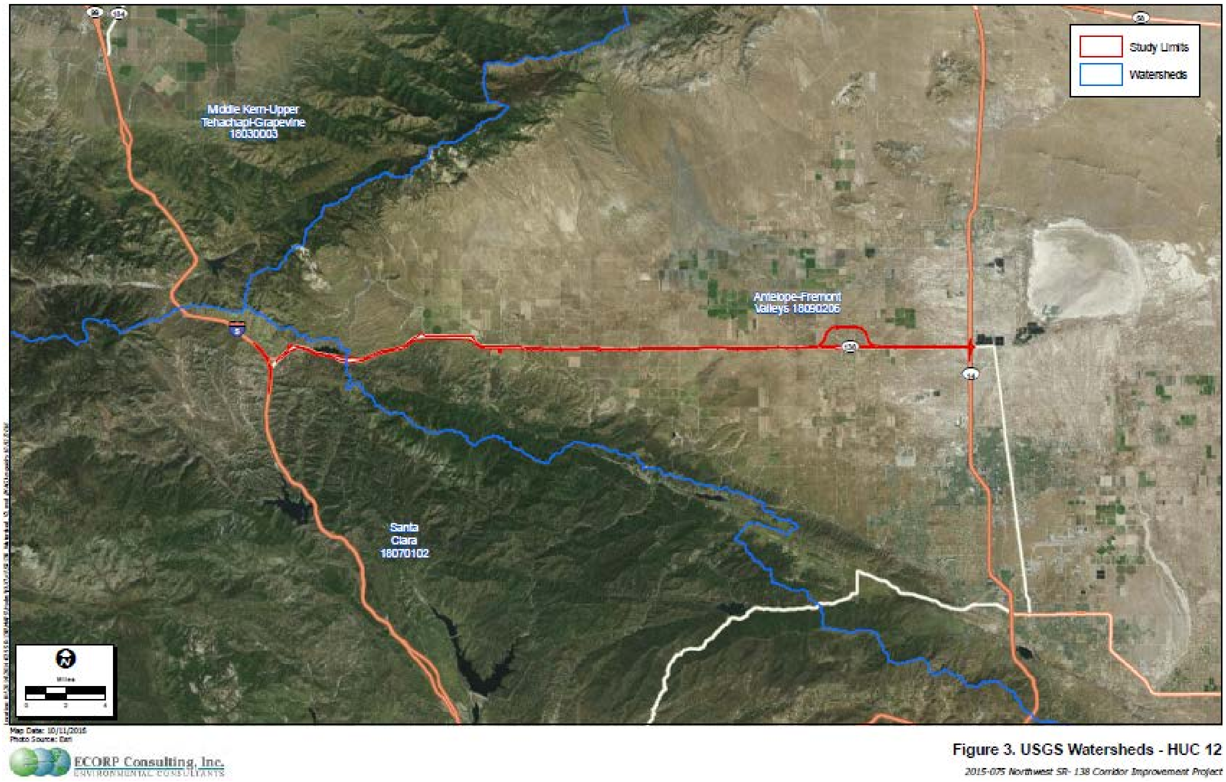
Affected Environment

Information in this section comes from the Natural Environment Study and the Jurisdictional Determinations contained in Appendix H of the Natural Environment Study.

A Jurisdictional Delineation Report was prepared during the 2014 and 2015 surveys years. Acreages of hydrological features within the BSA have been substantially reduced with the selection of preferred alternative 2 and may be further reduced with the guidance of USACE, SWRCB DWQ, and CDFW.

Figure 70 show the BSA in context of watersheds. Within the Antelope-Fremont Valley region of the BSA, several unnamed ephemeral dry washes (bodies of water lasting for a short period of time) occur and are characterized by short duration flows of storm surges and flash floods. These ephemeral dry washes are characteristic of the desert region and have no hydrological or ecological surface connections to navigable waters and should be considered non-jurisdictional. Within the Santa Clara watershed Quail Lake and Gorman Creek are considered the most prominent jurisdictional features. Several small streams traverse the project area west of Quail Lake. Most of these features are the result of local ephemeral streams that drain local hills and canyons during storms, and many have been altered and re-directed during road and highway construction. The flows of these streams all eventually reach Gorman Creek or Quail Lake.

Figure 70 Biological Study Area and Watersheds



USACE Jurisdiction

The BSA for the proposed project is located within the Antelope-Fremont Valleys Watershed and a small portion on the western end is located within the Santa Clara Watershed. The USACE take jurisdiction within the Santa Clara Watershed, and hydrological features within the Antelope-Fremont Valleys Watershed within the BSA are considered non-jurisdictional due to their terminus at dry lakes. All surface waters within the Santa Clara portion of the BSA flow through the Gorman Creek Subwatershed, which is the only subwatershed that falls within the western portion of the BSA.

The California Aqueduct flows through portions of the BSA. This structure is concrete lined and manmade, which has no headwaters or natural flow pattern. This hydraulic feature supports neither upland nor riparian vegetation, and is not considered a jurisdictional feature.

USACE Feature Type Classifications

The Quail Canal contains the water flowing out of Quail Lake. The canal is a wide concrete lined spillway that flows across SR-138 and south towards I-5. Within the project study area Quail Canal is identified as Features 85 and 86. Quail Canal enters into an underground pipeline approximately 0.5 mi east of I-5, where it ultimately flows to Pyramid Lake and Castaic Lake, which are traditional navigable waters. A smaller side canal is engineered to release a portion of aqueduct flows into the natural stream channel of Castaic Creek before it crosses under I-5.

Quail Lake is a natural lake that was expanded to provide recreational opportunities and to provide a regional storage facility for waters of the West Branch of the California Aqueduct.
Non-wetland water and streambed features include both natural and man-made channels.

Wetland features can be perennial or intermittent, and isolated or adjacent to other waters. To be determined a wetland, the following three criteria should be met:

- A majority (greater than 50 percent) of dominant vegetation species are wetland associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation for at least 5 percent of the growing season; and,
- Soils saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part and should exhibit hydric soil characteristics indicative of permanent or periodic inundation.

Wetland vegetation is normally characterized by vegetation in which more than 50 percent of the cover of dominant plant species is composed of obligate wetland, facultative wetland, or facultative species that occur in wetlands.

USACE feature types (wetland, non-wetland, lake, and canal) are differentiated on Table 114 and are equivalent relative to the alternatives under consideration. Coordination with USACE included verification of delineations, which are documented with an Approved Jurisdictional Determination and Preliminary Jurisdictional Determination (see Appendix H). Approved Jurisdictional Determinations were used for features that have also had Projects that have used Approved Jurisdictional Determinations, and were confirmed. All other features generally west and south of Quail Lake were submitted under a Preliminary Jurisdictional Determination.

Table 114: Baseline USACE Jurisdiction (Waters of the US)

	Sum of Acres
Overall Study Limits	3.79
canal	1.89
lake	0.01
non-wetland waters/streambed	1.24
wetland	0.65
Alternative 1 with Design Option	3.79
canal	1.89
lake	0.01
non-wetland waters/streambed	1.23
wetland	0.65
Alternative 1 without Design Option	3.79
canal	1.89
lake	0.01
non-wetland waters/streambed	1.23
wetland	0.65
Alternative 2	3.79
canal	1.89
lake	0.01
non-wetland waters/streambed	1.24
wetland	0.65

SWRCB DWQ Jurisdiction

Within the project footprint for the alternatives, impacts to features regulated by SWRCB DWQ include USACE features under CWA Section 401 and isolated features in closed watershed areas that are subject to regulation under the Porter-Cologne Water Quality Control Act. The BSA for the proposed project is located within the Antelope-Fremont Valleys Watershed and a small portion on the western end is located within the Santa Clara Watershed. All surface waters within the Santa Clara portion of the BSA flow through the Gorman Creek Subwatershed, which is the only subwatershed that falls within the western portion of the BSA.

All surface waters within the Antelope Valley portion of the BSA flow through the following Hyrdrologic Unit Code (HUC) sub-watersheds and either evaporate or percolate into the groundwater table:

- Pescado Creek
- Canyon del Gato-Montes
- Holiday Lake
- Spencer Canyon
- Kings Canyon
- Lower Amargosa Creek
- Broad Canyon
- Middle Amargosa Creek
- Piute Ponds Subwatershed

The California Aqueduct flows through portions of the BSA. This structure is concrete lined and manmade, which has no headwaters or natural flow pattern. This hydraulic feature supports neither upland nor riparian vegetation, and is not considered a jurisdictional feature.

SWRCB DWQ Feature Type Classifications

Within the project footprint for the alternatives, impacts to features regulated by SWRCB DWQ include USACE features, associated riparian vegetation, and isolated features in closed watershed areas that are subject to regulation under the Porter-Cologne Water Quality Control Act. The Quail Canal contains the water flowing out of Quail Lake. The canal is a wide concrete lined spillway that flows across SR-138 and south towards I-5. Within the project study area Quail Canal is identified as Features 85 and 86. Quail Canal enters into an underground pipeline approximately 0.5 mi east of I-5, where it ultimately flows to Pyramid Lake and Castaic Lake, which are traditional navigable waters. A smaller side canal is engineered to release a portion of aqueduct flows into the natural stream channel of Castaic Creek before it crosses under I-5.

Quail Lake is a natural lake that was expanded to provide recreational opportunities and to provide a regional storage facility for waters of the West Branch of the California Aqueduct.

Non-wetland water and streambed features include both natural and man-made channels.

Wetland features can be perennial or intermittent, and isolated or adjacent to other waters. To be determined a wetland, the following three criteria should be met:

- A majority (greater than 50 percent) of dominant vegetation species are wetland associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation for at least 5 percent of the growing season; and,

- Soils saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part and should exhibit hydric soil characteristics indicative of permanent or periodic inundation.

Wetland vegetation is normally characterized by vegetation in which more than 50 percent of the cover of dominant plant species is composed of obligate wetland, facultative wetland, or facultative species that occur in wetlands.

Isolated waters do not have a bed and bank, and is not associated with any stream or lake, but the species present are indicators for wetland hydrology. Features fall under isolated waters would likely be regulated under the state Porter-Cologne Act, as a "water of the State." See Table 115 for a summary of SWRCB DWQ jurisdiction by feature type and alternative.

Table 115: Baseline SWRCB DWQ Jurisdiction (Waters of the State)

	Sum of Acres
Overall Study Limits	13.26
associated riparian habitat	0.05
canal	1.89
isolated waters	2.78
lake	0.65
non-wetland waters/streambed	7.88
wetland	0.01
Alternative 1 with Design Option	13.23
associated riparian habitat	0.05
canal	1.89
isolated waters	2.78
lake	0.65
non-wetland waters/streambed	7.85
wetland	0.01
Alternative 1 without Design Option	13.23
associated riparian habitat	0.05
canal	1.89
isolated waters	2.78
lake	0.65
non-wetland waters/streambed	7.85
wetland	0.01
Alternative 2	11.87
associated riparian habitat	0.05
canal	1.89
isolated waters	2.78
lake	0.65
non-wetland waters/streambed	6.49
wetland	0.01

CDFW Jurisdiction
The BSA for the proposed project is located within the Antelope-Fremont Valleys Watershed and a small portion on the western end is located within the Santa Clara Watershed. All surface waters within the Santa Clara portion of the BSA flow through the Gorman Creek Subwatershed, which is the only subwatershed that falls within the western portion of the BSA.

All surface waters within the Antelope Valley portion of the BSA flow through the following Hydrologic Unit Code (HUC) sub-watersheds and either evaporate or percolate into the groundwater table:

- Pescado Creek
- Canyon del Gato-Montes
- Holiday Lake
- Spencer Canyon
- Kings Canyon
- Lower Amargosa Creek
- Broad Canyon
- Middle Amargosa Creek
- Piute Ponds Subwatershed

The California Aqueduct flows through portions of the BSA. This structure is concrete lined and manmade, which has no headwaters or natural flow pattern. This hydraulic feature supports neither upland nor riparian vegetation, and is not considered a jurisdictional feature.

CDFW Feature Type Classifications
Within the project footprint for the alternatives, impacts to features regulated by CDFW include USACE and SWRCB DWQ jurisdictional features as "streambeds" plus any riparian habitat associated with a bed, bank, or channel of a river, stream, or lake. The extent of associated riparian habitat for CDFW features was based on the extent of the canopy of the riparian community within or directly adjacent to the feature. In the Antelope-Fremont Valley Watershed, associated riparian/riverine habitat consisted of channel sides that were either unvegetated or vegetated with upland species that were also dominant in the plant communities that the channel bisected. These areas are likely regulated by CDFW.

The habitat value and function of associated riparian vegetation in the BSA is sufficient to provide cover for mammals, birds, herpetofauna, etc. Value of these areas decrease in zones with high invasive plant cover and large breaks in native vegetation along the riparian corridor. Although the condition of riparian vegetation is moderately disturbed due to grazing and/or man-made structures), the age distribution and vertical interspersion is relatively high due to the presence of trees, shrubs, saplings, and seedlings.

The Quail Canal contains the water flowing out of Quail Lake. The canal is a wide concrete lined spillway that flows across SR-138 and south towards I-5. Within the project study area Quail Canal is identified as Features 85 and 86. Quail Canal enters into an underground pipeline approximately 0.5 mi east of I-5, where it ultimately flows to Pyramid Lake and Castaic Lake, which are traditional navigable waters. A smaller side canal is engineered to release a portion of aqueduct flows into the natural stream channel of Castaic Creek before it crosses under I-5.

Quail Lake is a natural lake that was expanded to provide recreational opportunities and to provide a regional storage facility for waters of the West Branch of the California Aqueduct. Non-wetland water and streambed features include both natural and man-made channels.

Isolated waters may include features that have “acquired the physical attributes of natural stream courses and which have been viewed by the community as natural stream courses.” This includes isolated or intrastate drainage features that have no USACE jurisdiction.

Please refer to Table 116 through 118 for the baseline acreages of USACE, SWRCB DWQ, and CDFW jurisdictional features by classification in the study area.

Table 116: Baseline CDFW Jurisdiction (Waters of the State)

	Sum of Acres
Overall Study Limits	19.80
associated riparian habitat	9.32
canal	1.89
lake	0.65
non-wetland waters/streambed	7.94
Alternative 1 with Design Option	19.76
associated riparian habitat	9.31
canal	1.89
lake	0.65
non-wetland waters/streambed	7.92
Alternative 1 without Design Option	19.76
associated riparian habitat	9.31
canal	1.89
lake	0.65
non-wetland waters/streambed	7.92
Alternative 2	17.84
associated riparian habitat	8.75
canal	1.89
lake	0.65
non-wetland waters/streambed	6.55

Environmental Consequences

An alignment study identified major impacts to the Quail Lake drainage shed along the northern portion of the lake, access challenges for properties and the State Department of Water Resources' access to Quail Lake and the California Aqueduct System as well as geometric challenges with placing the roadway adjacent to the Lake and crossing the Aqueduct with a very large, costly structure similar to the one that was built over the aqueduct for the Cement Plant Road. This alignment would have also crossed sensitive habitats and was therefore considered undesirable from an environmental impact standpoint. The impacts and costs for this alignment option were too great to consider further. See Section 2.1.5, which describes why alternatives were withdrawn and not carried forward for analysis in the environmental document.

An analysis of the JD and project plans indicate reduced permanent impacts to jurisdictional features with the implementation of avoidance and minimization efforts.

USACE Jurisdiction

Pursuant to the CWA, all dredge and fill activities within Waters of the United States (WUS) are regulated under Section 404, by the USACE. The proposed project has the potential to have permanent impacts to no more than 1.63 acres of WUS found within the BSA. These acreage conclusions represent a calculated estimation of the jurisdictional areas within the project impact area and are subject to modification following the USACE verification process. With the implementation of avoidance and minimization measures, current designs of the proposed alignment do not exceed the NEPA/404 MOU (FHWA et al. 2006) threshold of five or more acres of permanent impacts to WUS.

Table 117: Total Proposed Impacts to USACE Jurisdictional Features by Alternative

	Permanent	Temporary
Alternative 1 with Design Option	1.63	2.16
canal	0.00	1.89
lake	0.01	0.00
non-wetland waters/streambed	1.15	0.08
wetland	0.47	0.18
Alternative 1 without Design Option	1.63	2.16
canal	0.00	1.89
lake	0.01	0.00
non-wetland waters/streambed	1.15	0.08
wetland	0.47	0.18
Alternative 2	1.63	2.16
canal	0.00	1.89
lake	0.01	0.00
non-wetland waters/streambed	1.15	0.09
wetland	0.47	0.18

State Water Resources Control Board Department of Water Quality (SWRCB DWQ) Jurisdiction

Pursuant to the CWA, all dredge and fill activities regulated under Section 404, are required to obtain a 401 Water Quality Certification from the State Water Resources Control Board's Division of Water Quality (SWRCB DWQ). Typically, Waters of the State of California (WSC), as regulated under Section 401 of the CWA, reflect those waters that fall under USACE jurisdiction. The SWRCB DWQ is ultimately responsible for determining their jurisdiction of WSC pursuant to Section 401 of the CWA and the Porter-Cologne Act. As such, permanent impacts to SWRCB DWQ jurisdictional features total no more than 6.18 acres. See Table 118 for SWRCB DWQ Temporary and Permanent impacts.

Table 118: Total Proposed Impacts to SWRCB DWQ and CDFW Jurisdictional Features by Alternative

Feature Type	Potential Jurisdiction in Study Area (in acres)			
	CDFW		SWRCB DWQ	
	Permanent	Temporary	Permanent	Temporary
Alternative 1 with Design Option	15.53	4.24	10.08	3.14
associated riparian habitat	8.17	1.14	0.05	0.00
canal	0.00	1.89	0.00	1.89
isolated waters	-	-	2.75	0.03
lake	0.47	0.18	0.47	0.18
non-wetland waters/streambed	6.89	1.02	6.81	1.04
wetland	-	-	0.01	0.00
Alternative 1 without Design Option	15.53	4.24	10.08	3.14
associated riparian habitat	8.17	1.14	0.05	0.00
canal	0.00	0.15	0.00	1.89
isolated waters			2.75	0.03
lake	0.47	0.18	0.47	0.18
non-wetland waters/streambed	6.89	1.02	6.81	1.04
wetland	-	-	0.01	0.00
Alternative 2	12.58	5.26	6.18	5.70
associated riparian habitat	7.31	1.44	0.05	0.00
canal	0.00	0.15	0.00	1.89
isolated waters	-	-	0.93	1.85
lake	0.47	0.18	0.47	0.18
non-wetland waters/streambed	4.80	1.75	4.72	1.77
wetland	-	-	0.01	0.00

CDFW Jurisdiction

Pursuant to Fish and Game Code (FGC) Section 1600-1603, any alterations within the streambed, bank and channels of WSC are regulated by CDFW. Temporary construction staging areas and access roads will be strategically placed to avoid and/or minimize impacts to CDFW jurisdictional features to the extent feasible and areas are expected to be enhanced to pre-project conditions.

At this preliminary design level, only bridges, concrete box culverts, and reinforced pipe culverts for named ephemeral washes have been evaluated; permanent impact calculations of all CDFW WSC within the project footprint have not been conducted. As such, permanent impacts totaling no more than 17.27 acres of CDFW WSC are conservatively estimated within the proposed areas. These preliminary calculations are based on mapped hydrological features within the BSA inclusive of all alternatives. Impacts are expected to dramatically decrease once design is finalized for the entire corridor.

Potential cumulative impacts associated with the proposed project include degradation of ephemeral drainages from increased recreational activities, urban development, grazing, utility construction and other activities associated with human disturbance. However, with the use of on-site enhancement and restoration, as well as off-site enhancement, restoration and protection in perpetuity, the cumulative effects of the proposed project is expected to remain low.

At the eastern edge of Quail Lake, there are well-defined, blue-line streams on the south side of the study corridor with directed flows into Quail Lake. Waters concentrate along the south side of the road and wetland conditions were observed in three locations (Feature Number 79, 81 and 82). These three features are considered federal and state jurisdictional wetlands (as defined by USACE). There will be no permanent impacts to Quail Lake, and these three wetland features on the south side of LA-138 are expected to have no more than 0.177 acres of permanent impacts. See Table 118 for CDFW Temporary and Permanent impacts.

Because a Section 404 permit can only be issued for the LEDPA (Least Environmentally Damaging Practicable Alternative), Section 404 compliance usually requires a more detailed and specific analysis of the aquatic impacts of each alternative. This analysis is referred to as a Section 404(b)(1) Alternatives Analysis. The Section 404(b)(1) specific analyses will be finalized in separate documentation as part of the project permitting process, in compliance with the law. In this case, Waters of the U.S. (WOUS) or USACE jurisdiction impacts are equal between the alternatives and so there is no LEDPA. Although WOUS impacts are equal between the three alternatives, WSC (CDFW and SWRCB DWQ) Impacts are least with Alternative 2, providing a proxy for LEDPA.

Cumulative Impacts

Health and Historical Context

California historically supported an estimated 5 million acres of wetlands. An estimated 91 percent of wetlands in California have been lost due to alterations in their biological, chemical and physical properties. The remaining wetlands are considered very valuable resources. Wetland values and functions include high productivity, water purification, flood control, nutrient removal and transformation, sediment stabilization and retention, water supply, ground water recharge and erosion control. The high biological productivity of wetlands results in important wildlife habitat for both aquatic and terrestrial animals and plants, including feeding, breeding and nursery grounds. A greater than average number of rare species are found in wetland habitats. Wetlands also provide a number of other scientific, educational and aesthetic uses.

Wetlands within the Lahontan Region are defined to include areas that are “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 (including) playa lakes, swamps, marshes, bogs and similar areas such as sloughs, prairie potholes, wet meadows, prairie river overflows, mudflats, and natural ponds” (40 CFR § 110.1[f]).

Because of its great topographic, geologic and climatic diversity, and because of environmental changes over time which have created ecological islands which facilitate evolutionary change, the Lahontan Region supports a wide variety of plant and animal species and many biological community types. Numerous plant and animal species in the Region are listed as threatened or endangered under the federal Endangered Species Act and/or the California Endangered Species Act (CESA), or are candidates for such listing. Examples include the Lahontan and Piute cutthroat trout, several kinds of desert pupfish, the Lake Tahoe shore zone plant Tahoe yellowcress, and springsnails which are restricted to a few springs in the Owens River watershed. These and many other sensitive species depend directly on aquatic or wetland habitats for survival. The Lahontan Region also includes water bodies which support rare or unique combinations of species (biological communities). Examples include the Grass Lake sphagnum bog in the Lake Tahoe Basin, the Mono Lake ecosystem, and the springs and wetlands in the Amargosa River watershed. Aquatic and wetland habitats for many sensitive species have been degraded, impaired, or threatened by water diversions and/or the nonpoint source problems (mining, silviculture, livestock grazing, etc.)

The Santa Clara River Watershed consists of approximately 1,634 square miles and contains the upper reaches of the Santa Clara River. The Upper Basin of the Santa Clara River is bounded by the San Gabriel Mountains to the south and southeast, the Santa Susana Mountains to the southwest, the Transverse Ranges to the northeast, the Sierra Pelona Mountains to the east, and the Ventura County Line to the west. The Region represents an area of approximately 654 square miles bounded by the San Gabriel Mountains to the south and southeast, the Santa Susana Mountains to the southwest, and the Liebre Mountains and Transverse Ranges to the northeast and northwest. Important wetland systems found in the Region include, but are not limited to, freshwater marshes, vernal pool systems and other perennial overflow areas.

The variety of riparian and wetland vegetation types that exist within the Region provide habitat for a diverse assemblage of plant and animal species. Supported species include vascular plants, vertebrates and invertebrate communities. Slope wetlands in the region support native grasslands such as needlegrass species and melic grasses, and seeps found in chaparral areas frequently support stands of giant rye. Vernal pools provide important breeding habitat for many terrestrial or semiaquatic species such as frogs, salamanders, and turtles. Wetlands found throughout the Region support communities of invertebrates such as native fairy shrimp, craneflies, stoneflies, water boatmen, and various beetle species. The health of the more sensitive of these invertebrate species serves as an important indicator of the overall integrity of the riverine, riparian and wetland ecosystems. Many of the Region’s special status and sensitive species are dependent upon wetland habitats for their survival.

A comprehensive delineation of wetlands in the Antelope Valley Region has not been conducted. However, the Antelope Valley Region is home to numerous desert washes (Little Rock Creek, Big Rock

Creek, Amargosa Creek, Cottonwood Creek System), as well as man- made lakes (Little Rock Creek Reservoir, Lake Palmdale), sag ponds (an enclosed depression formed where active or recent fault movement results in impounded drainage), and areas of rising groundwater. Freshwater marsh, wetland, and alkaline meadow habitat is present within the Piute Pond Complex. Wetland and wash areas are found within the Mesquite woodland. While wetland and riparian areas are limited in the Antelope Valley Region, these areas are important resources to birds migrating along the Pacific Flyway (LACSD 2004).

Reasonably Foreseeable Actions and Their Impacts

Table 119 lists the past, present, and foreseeable actions with particular relevance to wetlands and other waters as well as their impacts, if available.

Table 119: Reasonably Foreseeable Actions – Wetlands and Other Waters

Project	Impact Acres
California High Speed Train System	2 – 14 ac.
High Desert Corridor Project	2.03 – 4.70 ac.
Wildflower Green Energy Farm Project	3.51 ac.
Morgan Hills Wind Energy Project	0.25 ac.
North Los Angeles/Kern County Regional Recycled Water Project	TBD

It is anticipated that potential impacts associated with the California High Speed Train System could be greatly reduced through avoidance and minimization methods at the project level. Also, impacts associated with the North Los Angeles/Kern County Regional Recycled Water Project are considered less than significant with implementation of mitigation. Potential cumulative impacts associated with the proposed project include degradation of ephemeral drainages from increased recreational activities, urban development, grazing, utility construction and other activities associated with human disturbance. However with the use of on-site enhancement and restoration, as well as off-site enhancement, restoration and protection in perpetuity, the cumulative effects of the proposed project are expected to remain low. Based on the above discussion, the proposed project, in combination with the cumulative projects listed in Table 119 would not result in an adverse cumulative impact.

Avoidance, Minimization, and/or Mitigation Measures

Quail Lake and the California Aqueduct are the largest hydrological resources within the BSA. With current proposed project design these hydrologic features will not be permanently impacted by the proposed project. Project and culvert design will continue to be refined to include measures to protect sensitive areas and to maintain the hydrological integrity of the jurisdictional washes.

USACE AND SWRCB DWQ JURISDICTION

BIO-10: Gorman Creek is expected to have a clear-span bridge structure, requiring no fill or equipment access below the OHWM. This will avoid permanent and temporary direct impacts to jurisdictional areas.

BIO-11: Quail Lake is outside of the proposed construction zone will be designated as an Environmentally Sensitive Area (ESA) and no work will be conducted within the areas to avoid potential impacts to potential open water and riparian habitat. The areas will be fenced off clearly by the use of obvious, orange ESA exclusion fencing along the California Department of Water Resources (DWR) chain-link fence prior to the onset of ground disturbance. An approved avian biologist will oversee the placement and design of this fencing.

BIO-12: Most of the unnamed drainages have bridge structures and culverts that will maintain hydrologic integrity and support habitat functions and values. These will be further analyzed during design refinement with proposals for full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.

BIO-13: Any work within the ephemeral washes would be conducted when there is no flow during the dry season (April 15-October 31).

BIO-14: Temporary construction staging areas and access roads would be strategically placed to avoid and/or minimize impacts to CDFW, USACE and SWRCB jurisdictional features and shall be enhanced to pre-project conditions.

CDFW JURISDICTION

BIO-15: During the final design phase, a full span feasibility analysis shall be conducted for areas that may impact jurisdictional features. If full span culverts are not feasible, then multiple, large, cross-culverts of approximate 16 ft. height x 45 ft. width shall be implemented to maintain the hydrological integrity of jurisdictional features and support wildlife movement. Limits of jurisdictional features to be avoided will be demarcated by a qualified resource specialist with experience in jurisdictional delineation.

BIO-16: Isolated unnamed washes are expected to have culverts designed to maintain hydrologic integrity and support habitat functions and values. These concrete box culverts will be further analyzed during final design phases with proposals for full-span or non-embedded culverts above the bed, bank and channels to avoid permanent direct impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.

BIO-17: Approximately 47 existing cross culverts will be maintained or expanded. Approximately 25 cross culverts will be abandoned and an additional 93 cross culverts will be constructed to maintain hydrologic integrity and support habitat functions and values during the operational phase of the Preferred Alternative. The operational phase will have culverts ranging in size from 24 inches to 10 ft. by 10 ft. and vary between reinforced concrete pipes, reinforced concrete boxes, and corrugated metal pipes. These reinforced concrete pipe culverts would be further analyzed during the PS&E phase with proposals for non-embedded culverts above the bed, bank and channels to avoid permanent direct impacts to jurisdictional features.

BIO-18: Any work within the jurisdictional features shall be conducted when there is no flow during the dry season (April 15-October 31).

BIO-19: Temporary construction staging areas and access roads shall be strategically placed to avoid and/or minimize impacts to all jurisdictional features to the extent feasible and are expected to be enhanced to pre-project conditions.

USACE, SWRCB DWQ, AND CDFW Jurisdiction

BIO-20: Early coordination with USACE, SWRCB DWQ, and CDFW is currently ongoing for mitigation of impacts to jurisdictional features. Unavoidable impacts (both permanent and temporary) impacts to jurisdictional features of USACE, SWRCB DWQ, and CDFW will be mitigated for and would be determined during the permitting process with the agencies with considerations to on-site restoration, off-site mitigation, and in-lieu fees. In general, the mitigation proposals and mitigation ratios shall be determined using the California Rapid Assessment Method (CRAM) or other method approved by resource agencies to assess the quantity and quality of jurisdictional features and riparian habitat are based on the amount and quality of the permanently and directly impacted jurisdictional features of the agencies. All unavoidable permanent impacts to WSC must be mitigated and the Basin Plan requirements (minimum 1.5 to 1 ratio) will be considered for impacts to wetlands. All unavoidable permanent impacts to WUS must be mitigated and mitigation ratios will be determined utilizing 12501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios, published December 2012 by the US Army Corps of Engineers, South Pacific Division. Once PS&E begins, coordination will continue with USACE, SWRCB DWQ, and CDFW to determine the appropriate compensatory mitigation for the Preferred Alternative.

Wetlands Only Practicable Finding

The evaluation presented in this section satisfies the requirements of E.O. 11990 for projects constructed in wetlands. The No Build alternative is not practicable because it does not meet the purpose and need for the proposed project. Because there are wetlands throughout the SR-138 corridor, there are no practicable avoidance alternative for widening the highway and accomplishing the objectives of the proposed project.

The largest area of wetlands that would be impacted by the project are located directly south across SR-138 from Quail Lake and its associated wetlands (see samples points 81 and 82 in figures in Addendum to 2016 Federal Jurisdictional Delineation for the State Route 138 Northwest Corridor Improvement Project, November 2016 appended to the Natural Environment Study, December 2016). Given the isolated nature of these wetlands and the much more sensitive nature of the waters and wetlands around Quail Lake that support sensitive wildlife, the project proposes shifting the widening south to avoid the wetlands surrounding Quail Lake. The preceding section provides the avoidance, minimization, and mitigation measures that would be implemented for the proposed project to reduce impacts on wetlands. Based on the above considerations, it has been determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

3.3.3 Plant Species

Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection.
This section of the document discusses all the other special-status plant species, including CDFW species of special concern, and California Native Plant Society (CNPS) rare plants. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the

California Endangered Species Act (CESA). Please see the Threatened and Endangered Species section [3.3.5] in this document for detailed information about state and federally threatened and endangered plant species, and USFWS candidate species.

The regulatory requirements for FESA can be found at 16 United States Code (USC), Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act (CEQA), CA Public Resources Code, Sections 2100-21177.

Affected Environment

Information regarding plant species was obtained from the Natural Environment Study. Referencing aerial field maps, biologists used a combination of stopping along existing access roads and surveying areas on foot to characterize and map the vegetation communities and to identify any special-status habitats within the Project corridor study area. The boundaries of the vegetation communities were drawn on the field maps by hand and were then digitized in 2014 into a Geographic Information System to create the vegetation map. A focused sensitive plant survey was conducted by qualified biologists with extensive experience conducting botanical surveys and knowledge regarding plant taxonomy, plant species in the region, and special-status plant species. The purpose of the survey was to determine the presence or absence of sensitive plant species within the study area. Sensitive plant species are those federally or state listed as threatened or endangered or those considered rare by CNPS.

The survey team included Caltrans biologist Tania Asef, Andrew Johnstone, and Christopher Stevenson and consultant biologists Kevin Cornell, Josh Corona-Bennett, Clay DeLong, Emily Graf, Brad Haley, Greg Hampton, Teresa Johnson, Keith Kwan, Carley Lancaster, Ben Lardiere, Ben Smith, Cara Snellen, and Krissy Walker. Mr. Corona-Bennett was the lead surveyor. Survey methods were devised with consideration of the following resources: 1) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants (USFWS 1996), 2) CNPS Botanical Survey Guidelines (CNPS 2001), and 3) Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2009). The survey was scheduled to coincide with the target species bloom periods and during a period when target species were readily identifiable which was, in part, based on the results of assessments of reference plant populations.

Two separate surveys were conducted within the study area during spring 2015 and spring of 2016. The surveys targeted species with early spring blooming periods and species with a late spring blooming period. Pedestrian-based survey transects were conducted to provide 100 percent visual cover of the study area. Two Trimble Global Positioning System (GPS) units (Juno and GeoXT type) were used during surveys to record the coordinates of any sensitive plant species observed. Each GPS unit displayed a position using the Universal Transverse Mercator coordinate system, North American Datum 1983. Survey dates and surveyors are displayed in Table 121.

Biologists walked with transect spacing of approximately 30 feet, using GPS units to track paths walked so that 100 percent coverage could be achieved. In some locations with historic disturbance (e.g., grazing) where visibility was high, an expanded transect spacing was used with a maximum transect width of 60 feet.

The GPS data collected in the field were transferred from the GPS to a computer, and differential correction post-processing was performed. The data were then viewed and analyzed for verification, edited, and converted to a Geographic Information System (GIS) format at the time of download. In addition, field map notes were completed concurrent with GPS data collection and in some cases field data forms were also completed when appropriate.

Reference populations were visited in 2015 and 2016. Table 120 shows dates of the reference population visits.

Table 120: Reference Populations Visited

Date Visited	Scientific Name	Common Name	Location	Status
2/20/15	*California macrophylla*	round-leaved filaree	Field north of SR-138 across from entrance to Duck Hunt Club on Tejon Ranch.	CNPS List 1B.1
2/20/15 & 4/24/15	*Calochortus striatus*	alkali mariposa lily	West of intersection with SR-138 and 25th St. W.	CNPS List 1B.2
2/20/15 & 4/24/15	*Cryptantha clokeyi*	Clokey's cryptantha	Aliso Canyon, 1.8 miles West of Jct. of Aliso Canyon Road and Angeles Forest Hwy	CNPS List 1B.2
3/10/16 & 4/28/16	*Calochortus striatus*	alkali mariposa lily	West of intersection of SR-138 and 25th Street West.	CNPS Rank 1B.2
3/10/16	*Chorizanthe spinosa*	Mojave spineflower	Along 25th Street West, North of SR-138.	CNPS Rank 4.2
3/11/16	*California macrophylla*	round-leaved filaree	Field north of SR-138 across from entrance to Hunt Club on Tejon Ranch.	CNPS Rank 1B.1
3/11/16	*Microseris sylvatica*	sylvan microseris	South of Quail Lake and SR-138 before Ridge Route Road.	CNPS Rank 4.2
4/28/16	*Goodmania luteola*	golden goodmania	Southwest of the intersection of SR-138 and 30th Street West.	CNPS Rank 4.2

Table 121: Survey Dates and Personnel

Date	Personnel
3-9-15 through 3-13-15	**Josh Corona-Bennett, Greg Hampton, Ben Smith, and Cara Snellen**
3-16-15 through 3-20-15	**Josh Corona-Bennett, Clay DeLong, Greg Hampton, Theresa Johnson, Ben Smith, Cara Snellen, Christopher Stevenson (Caltrans), and Krissy Walker**
3-23-15 through 3-27-15	**Emily Graf, Brad Haley, Greg Hampton, and Ben Lardiere**
5-4-15 through 5-5-15	**Josh Corona-Bennett, Greg Hampton, Ben Lardiere, and Cara Snellen**
5-6-15	**Josh Corona-Bennett, Greg Hampton, Ben Lardiere, and Cara Snellen**
5-7-15 through 5-8-15	**Josh Corona-Bennett, Greg Hampton, and Ben Lardiere**
3-28-16 through 4-1-16	**Brad Haley, Greg Hampton, Carley Lancaster, Jerry Aguirre, Kevin Cornell, Clay Delong, Theresa Johnson, and Christopher Stevenson (Caltrans)**
4-5-16 through 4-7-16	**Greg Hampton, Carley Lancaster, Keith Kwan, Ben Lardiere, Christopher Stevenson (Caltrans), and Andrew Johnstone (Caltrans)**
5-2-16 through 5-4-16	**Greg Hampton, Kevin Cornell, Ben Lardiere, Christopher Stevenson (Caltrans), and Tania Asef (Caltrans)**

A total of twenty-nine (29) sensitive plant species were identified as being potentially present within the BSA, based on preliminary literature research, and historical documentation including the California Natural Diversity Database (CNDDB) occurrences. Elevation in the Project corridor ranges from approximately 3,590 feet (ft) (1,094 meters [m]) above mean sea level (msl) at the western extent of the Project corridor to approximately 2,320 ft (707 m) above msl at the eastern extent.

A literature review followed by field surveys conducted in 2014 and 2015 identified five special status plant species occurring within the proposed project area. Two California Native Plant Society (CNPS) species with rank 1B were observed; round-leaved filaree (*California macrophylla*) and alkali mariposa lily (*Calochortus striatus)*. Three CNPS list 4 species were observed, Mojave spineflower (*Chorizanthe spinose*), sylvan microseris (*Microseris sylvatica*), and golden goodmania (*Goodmania luteola*). The alkali mariposa lily was found to be the most prevalent sensitive plant species within the BSA. This plant was observed in flower during surveys for an approximate distance of four miles (6.4 km) from the eastern end of the BSA. Alkali mariposa lily was found north and south of SR-138 on both the east and west sides of SR-14. Alkali mariposa lily was predominantly encountered in shadscale scrub vegetation communities, but was also observed growing within and at the edges of mounds in alkaline flat areas.

Alkali mariposa lily observations in spring 2015 added new occurrences that were not previously included in the CNDDB (expanded known records to the east of those previously documented).
The second most prevalent sensitive plant species found within the BSA was the round-leaved filaree. This plant was observed in flower during early spring surveys within the Tejon Ranch property in close proximity to the Duck Hunt Club. Round-leaved filaree was observed on the north and south side of SR-138 near the Duck Hunt Club. Round-leaved filaree was predominantly encountered on slopes, but also flat areas, within foothill/valley grassland and rabbitbrush scrub vegetation communities. All round-leaved filaree observations in spring 2015 were previously included in the CNDDB.

Table 122: Special Status Plant Life Potentially Occurring or Known to Occur in the Project Area

Scientific Name Common Name	Status	Flowering Period / Elevation Range (meters)	Potential for Occurrence; Habitat
California macrophylla **round-leaved filaree**	**USFWS:** None **CDFW:** None **CNPS:** 1B.1 **BLM:** Sensitive	Mar-May (15-1200)	**Present:** Species was observed in the APE during surveys.
Calochortus striatus **alkali mariposa lily**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** Sensitive	April-June (70-1595)	**Present:** Species was observed in the APE during surveys.
Microseris sylvatica **sylvan microseris**	**USFWS:** None **CDFW:** None **CNPS:** 4.2 **BLM:** None	Mar-June (45-1500)	**Present:** Species was observed in the APE during surveys.
Chorizanthe spinosa **Mojave spineflower**	**USFWS:** None **CDFW:** None **CNPS:** 4.2 **BLM:** None	Mar-July (6-1300)	**Present:** Species was observed in the APE during surveys.

Scientific Name Common Name	Status	Flowering Period / Elevation Range (meters)	Potential for Occurrence; Habitat
Goodmania luteola **golden goodmania**	**USFWS:** None **CDFW:** None **CNPS:** 4.2 **BLM:** None	April-Aug (20-2200)	**Present:** Species was observed in the APE during surveys.
Opuntia basilaris* var. *treleasei **Bakersfield cactus**	**USFWS:** Endangered **CDFW:** Endangered **CNPS:** 1B.1 **BLM:** None	April-May (120-1140)	**High:** Several 2013 occurrences within 0.25 mi north of the APE (near west end at the northern terminus of APE); suitable habitat occurs within the APE.
Eriastrum rosamondense **Rosamond eriastrum**	**USFWS:** None **CDFW:** None **CNPS:** 1B.1 **BLM:** None	April-July (700-715)	**High:** An area with 15 individuals of eriastrum with similar morphology and inflorescence as *E. rosamondense* was observed and documented within the Project corridor during the 2016 rare plant surveys; however, further study is needed to positively verify that it is *E. rosamondense*.
Navarretia setiloba **Piute Mountains navarretia**	**USFWS:** None **CDFW:** None **CNPS:** 1B.1 **BLM:** Sensitive	April-July (285-2100)	**Moderate:** One occurrence within 5 mi north of the APE; marginal/limited amount of habitat occurs within the APE.
Navarretia peninsularis **Baja navarretia**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** None	June-Aug (1500-2300)	**Moderate:** One occurrence occurs within 5 mi of the APE and marginal/ limited amount of habitat occurs in the APE and elevation range for species exceeds that of APE.
Loeflingia squarrosa* var. *artemisiarum **sagebrush loeflingia**	**USFWS:** None **CDFW:** None **CNPS:** 2B.2 **BLM:** Sensitive	April-May (700-1615)	**Moderate:** Two occurrences within 5 mi of the APE and marginal or limited amounts of habitat occur within the APE.
Boechera lincolnensis **Lincoln rockcress**	**USFWS:** None **CDFW:** None **CNPS:** 2B.3 **BLM:** Sensitive	Mar -May (1100-2705)	**Moderate:** Suitable habitat occurs within the APE. CNDDB does not contain any point or polygon data that overlaps with the APE; however occurrences have been documented for the Neenach School and Fairmont Butte quads. Elevation range for species exceeds that of APE.
Calystegia peirsonii **Peirson's morning-glory**	**USFWS:** None **CDFW:** None **CNPS:** 4.2 **BLM:** None	April-June (30-1500)	**Moderate:** Suitable habitat occurs within the APE; one occurrence record within 5 mi. of the APE.
Canbya candida **white pygmy-poppy**	**USFWS:** None **CDFW:** None **CNPS:** 4.2 **BLM:** None	Mar - June (600-1460)	**Moderate:** Suitable habitat occurs within the APE; no known occurrences within 5 mi. of the APE.
Delphinium parryi* ssp. *purpureum **Mt. Pinos larkspur**	**USFWS:** None **CDFW:** None **CNPS:** 4.3 **BLM:** None	May-June (1000-2600)	**Moderate:** Suitable habitat occurs within the APE; no known occurrences within 5 mi. of the APE.

Scientific Name Common Name	Status	Flowering Period / Elevation Range (meters)	Potential for Occurrence; Habitat
Perideridia pringlei **adobe yampah**	**USFWS:** None **CDFW:** None **CNPS:** 4.3 **BLM:** None	April-Jun (300-1800)	**Moderate:** Suitable habitat occurs within the APE; no known occurrences within 5 mi. of the APE.
Thermopsis californica* var. *argentata **silvery false lupine**	**USFWS:** None **CDFW:** None **CNPS:** 4.3 **BLM:** None	April-Oct (665-1595)	**Moderate:** Suitable habitat occurs within the APE; no known occurrences within 5 mi. of the APE.
Chorizanthe parryi* var. *fernandina **San Fernando valley spineflower**	USFWS: **Candidate** CDFW: **Endangered** CNPS: **1B.1** BLM: **None**	**April-July** **(90-500)**	**Low:** No occurrence record within 5 mi. of the Project; marginal to no habitat occurs within the Project corridor and elevation the Project site is likely too high for this species to occur.
Eriogonum callistum **Tehachapi buckwheat**	USFWS: **None** CDFW: **None** CNPS: **1B.1** BLM: **None**	**May-July** **(1400-1500)**	Low: **No occurrence record within 5 mi. of the site; marginal to no habitat occurs within the APE and elevation range for species exceeds that of APE.**
Eriophyllum lanatum* var. *hallii **Fort Tejon woolly sunflower**	**USFWS:** None **CDFW:** None **CNPS:** 1B.1 **BLM:** None	May-July (1065-1500)	**Low:** No occurrence record within 5 mi. of the site; marginal to no habitat occurs within the APE and elevation range for species exceeds that of APE.
Calochortus clavatus* var. *gracilis **slender mariposa lily**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** Sensitive	Mar-June (320-1000)	**Low:** One occurrence record within 5 mi. of the site; marginal to no habitat occurs within the APE.
Calochortus palmeri* var. *palmeri **Palmer's mariposa lily**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** Sensitive	April-July (710-2390)	**Low:** One occurrence record within 5 mi. of the site; marginal to no habitat occurs within the APE.
Cryptantha clokeyi **Clokey's cryptantha**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** Sensitive	April (725-1365)	**Low:** One occurrence record within 5 mi. of the site; suitable habitat occurs within the APE, however the CNDDB does not contain any recent record for this species within five miles from the site.
Symphyotrichum defoliatum **San Bernardino aster**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** Sensitive	July-Nov (2-2040)	**Low:** One occurrence record within 1.5 mi. east of the APE from the year 1900; suitable habitat exists within the APE, however the CNDDB does not contain any other record for this species since 1900 within five miles from the site.
Nemacladus secundiflorus* var. *robbinsii **Robbins' nemacladus**	**USFWS:** None **CDFW:** None **CNPS:** 1B.2 **BLM:** None	April-June (350-1700)	**Low:** One occurrence record within 1 mi. west of the APE from the year 1978; marginal to no habitat exists within the APE. CNDDB contain one other record for this species in 2010 approximately 15 miles from the site.

Navarretia fossalis **spreading navarretia**	**USFWS:** Threatened **CDFW:** None **CNPS:** 1B.1 **BLM:** None	April-June (30-1300)	**Low:** Marginal/limited habitat occurs within the Project corridor. CNDDB does not contain any point or polygon data that overlaps or occurs within 5 miles of the Project; however occurrences have been documented for the Lake Hughes quad.
Calochortus fimbriatus **late-flowered mariposa lily**	**USFWS:** None **CDFW:** None **CNPS:** 1B.3 **BLM:** Sensitive	June-Aug (275-1905)	**Low:** No occurrence record within 5 mi. of the site; marginal to no habitat occurs within the APE.
Monardella linoides **ssp. *oblonga*** **Tehachapi monardella**	**USFWS:** None **CDFW:** None **CNPS:** 1B.3 **BLM:** Sensitive	June-Aug (900-2470)	**Low:** One occurrence record located approximately 5.75 mi. north of APE; marginal to no habitat occurs within the APE.
Orcuttia californica **California orcutt grass**	**USFWS:** Endangered **CDFW:** Endangered **CNPS:** 1B.1 **BLM:** None	April-August (<700)	**Low:** No occurrence record within 5 mi. of the Project; marginal/limited habitat occurs within the Project corridor and elevation range for the species is too low for the project.
Syntrichopappus lemmonii **Lemmon's syntrichopappus**	**USFWS:** None **CDFW:** None **CNPS:** 4.3 **BLM:** None	April-May (500-1830)	**Low:** One occurrence record within 1 mi. north of the APE from the year 1895; suitable habitat exists within the APE, however the CNDDB does not contain any other record for this species since 1895 within five miles from the site.
California Native Plant Society (CNPS) Designations: **1A: Plants presumed extinct in California.** **1B: Plants rare and endangered in CA and throughout their range.** **2: Plants rare, threatened, or endangered in CA but more common elsewhere in their range.** **3: Plants about which need more information; a review list.** **4: Plants of limited distribution; a watch list.**			
Plants 1B, 2, and 4 extension meanings: **.1 Seriously endangered in CA (over 80% of occurrences threatened / high degree and immediacy of threat)** **.2 Fairly endangered in California (20-80% occurrences threatened)** **.3 Not very endangered in CA (<20% of occurrences threatened or no current threats known)**			
Other Designations BLM Sensitive: Bureau of Land Management (BLM) Sensitive Plant Species List, 2013.			

Environmental Consequences

Round-Leaved Filaree (*California macrophylla*)

Focused rare plant surveys took place for the proposed project the spring of each year 2015-2016 during the known blooming periods of sensitive plant species. These surveys positively identified individuals occurring within the BSA in the spring of each year 2015-2016.

The second most prevalent sensitive plant species within the APE is round-leaved filaree. This plant was observed in flower during early spring surveys within the Tejon Ranch property in close proximity to the Duck Hunt Club. Round-leaved filaree was observed on the north side of SR-138 as a subpopulation that extended for an approximate distance of 0.25 mile (0.4 km) to the west from the Duck Hunt Club gate. South of SR-138, round-leaved filaree was observed growing as a subpopulation that extended for an approximate distance of 0.5 mile (0.8 km), ending 0.7 mile (1.13 km) east of the Duck Hunt Club gate. In many cases, round-leaved filaree was observed growing with or in close proximity to sylvan microseris (*Microseris sylvatica*), a CNPS List 4 species. Round-leaved filaree was predominantly encountered on slopes, but also flat areas, within foothill/valley grassland and rabbitbrush scrub vegetation communities. All round-leaved filaree observations in spring 2015 were previously included in the CNDDB.

Within the BSA individuals of this species were found to occur during focused surveys. With the implementation of the avoidance and minimization measures, permanent impacts to 2.68 acres (2941 individuals) and temporary impacts to 1.97 acres (976 individuals) of round-leaved filaree occupied habitat are expected to be impacted by the Preferred Alternative, see Table 123. With incorporation of avoidance and minimization measures, impacts to these species would be low.

Table 123: Impacts to Round-leaved Filaree Habitat

ROUND-LEAVED FILAREE			
Habitat	**Permanent Acres**	**Temporary Acres**	**Total**
BUILD ALTERNATIVE 1 – Freeway - Expressway			
Total Habitat	2.68	1.97	4.65
Individuals	2941	976	3917
BUILD ALTERNATIVE 1 WITH DESIGN OPTION 1 – Antelope Acres Bypass			
Total Habitat	2.68	1.97	4.65
Individuals	2941	976	3917
BUILD ALTERNATIVE 2 – Expressway – Conventional Highway			
Total Habitat	2.68	1.97	4.65
Individuals	2941	976	3917

Alkali Mariposa Lily (*Calochortus striatus*)

Focused rare plant surveys took place for the proposed project in both the spring of each year 2014 to 2016 during the known blooming periods of sensitive plant species. These surveys positively identified individuals occurring within the BSA in the spring of each year from 2014 to 2016. These occurrences were located in the alkali flat areas in the far eastern portion of the BSA, adjacent to SR-14. However, it should be noted that these surveys occurred within drought years, and the bulbs of these species remain dormant in dry years. Due to these study limitations, even though individuals were found, exact numbers of individuals occurring within the BSA is undetermined.

Habitat for this species is limited to the far eastern area of the BSA, near SR-14. This species was found to be the most prevalent sensitive plant species within the BSA. This plant was observed in flower during surveys as far east as 15th Street West, and as far west as 60th Street West, for an approximate distance of four miles (6.4 km) from the eastern terminus of the APE. Alkali mariposa lily was found north and south of SR-138 on both the east and west sides of SR-14. In practically every case that alkali mariposa lily was observed, it was growing with or in close proximity to Mojave spineflower (*Chorizanthe spinosa*), a CNPS List 4 species, and in many cases nearby to golden goodmania (*Goodmania luteola*), a CNPS List 4 species. Alkali mariposa lily was predominantly encountered in shadscale scrub vegetation communities, but was also observed growing within and at the edges of hummocks in alkaline flat areas. Alkali mariposa lily observations in spring 2015 added new occurrences that were not previously included in the CNDDB (expanded known records to the east of those previously documented).

Within the BSA individuals of this species were found to occur during focused surveys. With the implementation of the avoidance and minimization measures, permanent impacts to 2.48 (1062 individuals) and temporary impacts to 1.16 acres (293 individuals) of alkali mariposa lily occupied habitat are expected to be permanently impacted by the proposed project. With incorporation of avoidance and minimization measures, impacts to these species would be low.

Table 124: Impacts to Alkali Mariposa Lily Habitat

ALKALI MARIPOSA LILY			
Habitat	**Permanent Acres**	**Temporary Acres**	**Total**
BUILD ALTERNATIVE 1 – Freeway - Expressway			
Total Habitat	4.33	0.97	5.30
Individuals	1779	198	1977
BUILD ALTERNATIVE 1 WITH DESIGN OPTION 1 – Antelope Acres Bypass			
Total Habitat	4.33	0.97	5.30
Individuals	1779	198	1977
BUILD ALTERNATIVE 2 – Expressway – Conventional Highway			
Total Habitat	2.48	1.16	3.64
Individuals	1062	293	1355

<u>Mojave Spineflower (*Chorizanthe spinosa*)</u>

Focused rare plant surveys took place for the proposed project in the spring of each year from 2014 to 2016 and occurred during the known blooming periods of sensitive plant species. These surveys positively identified individuals occurring within the BSA in the spring of each year from 2014 to 2016.

The Mojave spineflower was observed in flower during early spring surveys within the BSA. This species was mainly observed in the eastern extent of the BSA from 15th Street West to the west, ending at 60th Street West (the same extent of Alkali Mariposa Lily). Another isolated and small population of Mojave spineflower was also encountered on the eastern side of Quail Lake and within the Tejon Ranch property, at the transition point of an alkaline flat area and valley/foothill grassland vegetation community (north of SR-138).

Within the BSA individuals of this species were found to occur during focused surveys. Table 125 contains impact acreages of suitable Mojave spineflower habitat within each proposed alternative. These individuals have the potential to be impacted by the proposed project construction. With the implementation of the avoidance and minimization measures, the proposed project is anticipated to have a low level of impact on this sensitive plant species.

Table 125: Impacts to Mojave Spineflower Habitat

MOJAVE SPINEFLOWER			
	Permanent Acres	**Temporary Acres**	**Total**
BUILD ALTERNATIVE 1 – Freeway - Expressway			
Total Habitat	102.44	20.92	123.36
BUILD ALTERNATIVE 1 WITH DESIGN OPTION 1 – Antelope Acres Bypass			
Total Habitat	102.44	20.92	123.36
BUILD ALTERNATIVE 2 – Expressway – Conventional Highway			
Total Habitat	71.98	21.85	93.83

Sylvan Microseris (*Microseris sylvatica*)

Focused rare plant surveys took place for the proposed project in the spring of each year from 2014 to 2016 and occurred during the known blooming periods of sensitive plant species. These surveys positively identified individuals occurring within the BSA in the spring of each year from 2014 to 2016.

Sylvan microseris was observed during early spring surveys within the BSA. This species was encountered at 300th Street West and extended to the west for approximately five miles (8 km) to a point just south of the eastern edge of Quail Lake. The majority of occurrences of sylvan microseris were on the south side of SR-138. Please see Appendix Q: Sensitive Plant Survey Report, of the NES for further details (July 2015).

Within the BSA individuals of this species were found to occur during focused surveys. Table 126 contains impact acreages of suitable sylvan microseris habitat within each proposed alternative. These individuals have the potential to be impacted by the proposed project construction. With the implementation of the avoidance and minimization measures, the proposed project is anticipated to have a low level of impact on this sensitive plant species.

Table 126: Impacts to Sylvan Microseris Habitat

SYLVAN MICROSERIS			
	Permanent Acres	**Temporary Acres**	**Total**
BUILD ALTERNATIVE 1 – Freeway - Expressway			
Total Habitat	136.56	69.85	206.41
BUILD ALTERNATIVE 1 WITH DESIGN OPTION 1 – Antelope Acres Bypass			
Total Habitat	136.56	69.85	206.41
BUILD ALTERNATIVE 2 – Expressway – Conventional Highway			
Total Habitat	100.24	95.62	195.86

Golden Goodmania (*Goodmania luteola*)

Focused rare plant surveys took place for the proposed project in the spring of each year from 2014 to 2016 and occurred during the known blooming periods of sensitive plant species. These surveys positively identified individuals occurring within the BSA in the spring of each year from 2014 to 2016.

Golden goodmania, encountered on the north and south sides of SR-138 from approximately 30th Street West to 45th Street West. Within the BSA individuals of this species were found to occur during focused surveys. Table 127 contains impact acreages of suitable golden goodmania habitat within each proposed alternative. These individuals have the potential to be impacted by the proposed project construction. With the implementation of the avoidance and minimization measures, the proposed project is anticipated to have a low level of impact on this sensitive plant species.

Table 127: Impacts to Golden Goodmania Habitat

GOLDEN GOODMANIA			
	Permanent Acres	**Temporary Acres**	**Total**
BUILD ALTERNATIVE 1 – Freeway - Expressway			
Total Habitat	102.44	20.92	123.36
BUILD ALTERNATIVE 1 WITH DESIGN OPTION 1 – Antelope Acres Bypass			
Total Habitat	102.44	20.92	123.36
BUILD ALTERNATIVE 2 – Expressway – Conventional Highway			
Total Habitat	71.98	21.85	93.83

Rosamond Eriastrum (*Eriastrum rosamondense)*

Focused rare plant surveys took place for the proposed project in the spring of each year from 2014 to 2016 and occurred during the known blooming periods of sensitive plant species. These surveys positively identified individuals occurring within the BSA in the spring of each year from 2014 to 2016.

A plant that was suspected of being Rosamond eriastrum (*Eriastrum rosamondense*; CNPS Rank 1B.1) was observed and documented approximately 2,000 feet west of the SR-14/SR-138 interchange during spring 2016 surveys. Two locations within 815 feet of each other were encountered on the north side of SR-138 and between 25th Street West and 30th Street West, both occurrences were approximately 75 feet north of the edge of pavement. A solitary occurrence and one group of 10 were observed. The plants were found growing within a complex of hummocks intermixed with allscale scrub.

During 2016 surveys, a total of 15 individuals of eriastrum species resembling *Eriastrum rosamondense* was observed; however, more field study is necessary to verify the specific epithet. CNDDB research did show that several occurrences of *E. rosamondense* have been recorded within the vicinity of the observations recorded during the 2016 survey. Literature describing *E. rosamandense* is lacking, additionally there is not an entry for the species in *The Jepson Manual, 2nd Ed.* (Baldwin et al. 2012). Caltrans will employ the use of qualified biologists to implement avoidance and minimization measures for this species, in coordination with the appropriate regulatory agencies. With incorporation of avoidance and minimizationmeasures, impacts to this species would be low.

Sensitive Plant Species with Potential to Occur

A total of 24 sensitive plant species were determined to have a potential to occur in the BSA. Although these species were not determined to be present during these surveys, positive identification of some species occurring in the BSA could have been affected by long-term drought conditions or blooming periods. Impacts to the sensitive plant species listed in Table 122 with potential to occur will be considered less than significant with the implementation of the rare plant mitigation measures below.

Cumulative Impacts

The proposed project area traverses approximately thirty-six (36) miles of the Antelope Valley region, ending within the Tehachapi Mountains at the western end. The project corridor is situated on the north side of the San Gabriel Mountains, largely within the Antelope Valley that comprises the western Mojave Desert, and south of the Tehachapi Mountains. The majority of the eastern portion of the

Project corridor largely comprises vegetation communities characteristic of the Mojave Desert, whereas the western one-third of the project corridor represents a transition zone between desert, foothill and montane environments.

The Project area traverses the Antelope Valley and enters the Tehachapi Mountains at the western end. The Project area is dominated by desert vegetation communities and agricultural fields within the Antelope Valley. A number of solar farms have recently been developed along the Project corridor in the central portion of the study area. The Project area also passes through several small residential communities and bisects the California aqueduct. Vegetation is more diverse and a larger number of vegetation communities, including riparian communities, are present in the western portion of the study area where the corridor reaches the foothills of the Tehachapi Mountains.

Health and Historical Context

Round-leaved filaree grows in valley and foothill grasslands in open habitat on friable clay soils. This small annual is apparently well distributed in central and northern California, but is very rare in Southern California. Round-leaved filaree is presumed to be declining in Southern California due to loss of its friable clay microhabitat. All populations in Southern California are recommended for protection despite the sizeable populations to the north. The very crumbly clay soil is itself quite rare in the region and undoubtedly accounts for the rarity of several species restricted to this substrate.

Alkali mariposa lily is a rare endemic of moist alkaline areas in the arid interior of southern California and southern Nevada. In California, populations are scattered in Kern, northeastern Los Angeles, and southern and central San Bernardino counties. The alkali mariposa lily has a wide range in the saltbush lowlands of the Antelope Valley at most desert springs and hot springs in the Tehachapi-Southern Sierra Mountain Ranges. Seasonally moist alkaline habitat is critical limiting factor in the occurrence of this species. The greatest threat to this habitat is the lowering of water tables.

The next greatest threat to this species is urbanization in the Lancaster area where the largest populations are concentrated. An additional threat is trampling and grazing by cattle, which may severely reduce its reproductive capacity. In general, data availability for alkali mariposa lily is poor. Population trends are difficult to assess due to the large year-to-year fluctuations.
Mojave spineflower is endemic to the west Mojave Desert within Kern, Los Angeles, and San Bernardino counties. The Mojave spineflower occurs primarily in bare areas in the saltbush scrub of the Antelope Valley. It does well in disturbed soils and would grow in utility corridors and abandoned roads in saltbush scrub habitat. Sylvan microseris has a broad distribution, occurring in 20 counties from southern California to northern California, including the western Mojave Desert. Golden goodmania has been found in Fresno, Inyo, Kern, Los Angeles, Mono and Tulare counties. This species is threatened by non-native plants, groundwater lowering, trampling cattle, and development.

Reasonably Foreseeable Actions and Their Impacts

Table 128 lists the past, present, and reasonably foreseeable actions with potential to impact round-leaved filaree (*California macrophylla*), alkali mariposa lily (*Calochortus striatus)*, Mojave spineflower (*Chorizanthe spinosa*), sylvan microseris (*Microseris sylvatica*), and golden goodmania (*Goodmania luteola*), Bakersfield cactus (*Opuntia basilaris* var. *treleasei)*.

All of the projects listed in Table 128 would incorporate avoidance, minimization and/or mitigation measures that would result in reduced impacts to sensitive plant species. Also, with the use of avoidance and minimization measures, on-site mitigation plantings and the purchase of mitigation parcels it is anticipated that the proposed project would not result in a net loss of sensitive plant species. When combined with other past, present, and reasonably foreseeable actions, the cumulative effect on this sensitive plant is expected to remain low. The proposed project, in combination with the cumulative projects would not result in an adverse cumulative impact.

Table 128: Reasonably Foreseeable Actions – Plant Species

Project	**Impact (Potential Occurrence)**
California High Speed Train System	Alkali Mariposa Lily **(Present)**
High Desert Corridor	Alkali Mariposa Lily **(Present – 13 individuals)**
Pacific Wind Energy	Alkali Mariposa Lily **(Low)** Mojave Spineflower **(Moderate)**
Rising Tree Wind Farm	Alkali Mariposa Lily Mojave Spineflower Golden Goodmania **(Possible)**
Lower West Wind Energy Project	Alkali Mariposa Lily Mojave Spineflower **(Low)**
Willow Springs Solar Array	Alkali Mariposa Lily **(Present – Several Hundred Individuals)**
Rosamond Solar Array Project	Alkali Mariposa Lily **(Moderate)**
RE Garland Solar Project	Alkali Mariposa Lily **(Low)**
Mojave-Rosamond Recycling and Sanitary Landfill Permit Revision Project	Alkaline Mariposa Lily **(Not Observed)**
Centennial Specific Plan and Project	Round-Leaved Filaree **(Present)** Mojave Spineflower **(Present)** Sylvan Microseris **(Present)**

Avoidance, Minimization, and/or Mitigation Measures

Due to the 2014 - 2016 rare plant surveys taking place during drought years, the exact number and location of individuals is unknown at this time. However, individuals of the round-leaved filaree (*California macrophylla),* alkali mariposa lily (*Calochortus striatus*), Mojave spineflower (*Chorizanthe spinosa*), sylvan microseris (*Microseris sylvatica*) and golden goodmania (*Goodmania luteola*) are known to occur within the BSA and were positively identified during focused surveys. Spring 2017 sensitive plant surveys will be performed in a non-drought year to determine a more accurate number of individuals occurring within the BSA. Results will be available to the public upon request. Caltrans will employ the use of qualified biologists to implement avoidance and minimization measures for this species, in coordination with the appropriate regulatory agencies.

BIO-21: Pre-construction surveys shall be conducted to provide the numbers of individual rare plants and to ground truth areas with strong potential for occurrences due to soil type.

BIO-22: Known occurrences of rare plants shall be preserved in place. A qualified biologist shall protect known occurrences of rare plants by establishing an environmentally sensitive area (ESA), using brightly colored fencing and monitoring any clearing and grubbing related construction activities.

BIO-23: If impacts cannot be avoided, then individuals of each rare plant species shall have its seeds and bulbs collected and propagated at preapproved nurseries and replanted onsite. If it is determined that an on-site re-planting is in poor health, it shall be replaced by a healthy individual and shall continue to be monitored during the 5 year monitoring period.

BIO-24: 8-12 inches of topsoil salvage will be used to help facilitate the germination and growth of harvested seeds in the on-restoration areas of the Project, and to account for rare plant seeds that may be within the topsoil.

BIO-25: On-site mitigation plantings within Caltrans ROW shall have a separate landscape contract with a 2 year plant propagation period, 3 year plant establishment period, and 5 year monitoring period. On-site mitigation plantings shall be monitored by a qualified biologist seasonally to determine health and viability. If it is determined that an on-site planting is in poor health, it shall be replaced by a healthy individual and shall continue to be monitored during the 5 year monitoring period.

BIO-26: If impacts to the Round-Leaved Filaree (*California macrophylla*) species and/or Alkali Mariposa Lily (*Calochortus striatus*) species are unavoidable, mitigation will be required. Efforts will be made to acquire lands adjacent to the project limits with equal habitat, equal hydrology, and equal soil conditions. Caltrans anticipates off-site mitigation for permanent impacts at a minimum of a 2:1 ratio and temporary impacts at a minimum of a 1:1 ratio for rare plant species and shall be coordinated with CDFW. Specifics related to revegetation performance measures and success criteria will be determined in a subsequent HMMP in coordination with resource agencies.

BIO-27: During the final design phase of the project, an onsite mitigation feasibility analysis shall be conducted. If it is deemed that on-site relocation of individuals or on-site plantings within Caltrans ROW are not possible after construction is complete, off-site mitigation shall be completed within the region and shall preserved in perpetuity. Efforts will be made to acquire lands adjacent to the project limits with equal habitat, equal hydrology, and equal soil conditions. Caltrans anticipates off-site mitigation for permanent impacts at a minimum of a 2:1 ratio and temporary impacts at a minimum of a 1:1 ratio for rare plant species and shall be coordinated with CDFW. Specifics related to revegetation performance measures and success criteria will be determined in a subsequent HMMP in coordination with resource agencies. With the use of avoidance and minimization measures, on-site mitigation plantings and the purchase of mitigation parcels, it is anticipated at this time that this project would not result in a net loss of this sensitive plant species. When combined with other approved projects in the region of the BSA, the cumulative effect on this sensitive plant is expected to remain low.

3.3.4. Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered, or as candidate species are discussed in Section 3.3.5 below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Section 4150 and 4152 of the California Fish and Game Code
- Section 2081 of the California Fish and Game Code
- Title 14, Section 460 of the California Code of Regulations
- Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code Title 14, Section 670.7 of the California Code of Regulations
- Section 3503.5 of the California Fish and Game Code
- Section 3513 of the California Fish and Game Code

Affected Environment

Information regarding special status species was obtained from the Natural Environment Study. CDFW is the primary agency responsible for coordination and review involving special-status species. The findings summarized in this section were based on extensive research and field surveys for CDFW special-status species in the biological study area and its vicinity. Prior to the surveys, record searches of the California Natural Diversity Database (CNDDB) were conducted. The CNDDB species list covering the project study area are provided in Appendix F of the NES.

A total of thirty-nine (39) special status animal species were identified as occurring within the vicinity of the proposed project site. Of those, twenty-eight (28) species were observed or have a potential to occur within the project limits due to habitat suitability as noted in Table 129. Discussions of these species, excluding threatened and endangered species, are included in the Environmental Consequences section that follows Table 129. Discussions of least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Epidonax traillii extimus*), bald eagle (*Haliaeetus leucocephalus*), California condor (*Gymnogyps californianus*), and Swainson's hawk (*Buteo swainsoni*) can be found in Section 3.3.5 (Threatened and Endangered Species).

Table 129: Special-Status Wildlife Species, CDFW Watch List Species, and Critical Habitat Potentially Occurring or Known to Occur in the Project Area.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Species Present/ Absent	Rationale/Potential for Occurrence
Golden Eagle	*Aquila chrysaetos*	FP	Rolling foothills, mountains areas, sage-juniper flats and desert	P	Sage-juniper flats and desert foraging areas occur within the project limits. The species has the potential forage within the project area. This species was observed nesting adjacent to the project limits.
Burrowing Owl	*Athene conicularia*	SSC	Open Dry Scrublands	P	Bare ground and dry annual grasses are present within the proposed project area. The species has high potential to occur within the project area. This species was positively identified during focused surveys.
Northern Harrier	*Circus cyaneus*	SSC	Freshwater marshes, wet meadows, annual and perennial grasslands	P	Suitable habitat exists within the project limits. None observed during focused surveys.
Short-eared owl	*Asio flammeus*	SSC	Open country, near wetlands. (e.g., freshwater marshes, swamps, salt marshes), farmland, meadows, prairies, and dunes in California	HP	Suitable wintering habitat exists within the project limits. None observed during biological or raptor surveys.
White-Tailed Kite	*Elanus leucurus*	FP	Savannas, open woodlands, marshes, desert grassland, cultivated fields	HP	Suitable habitat exists within the project limits. None observed during focused surveys.
Peregrine Falcon	*Falco pergrines*	FP	Wetlands, lakes, rivers, cliffs, dunes and human made structures	P	Suitable habitat exists within the project limits. Observed during focused surveys.

Common Name	**Scientific Name**	**Status**	**General Habitat Description**	**Habitat Present/ Species Present/ Absent**	**Rationale/Potential for Occurrence**
Tricolored Blackbird	*Agelaius tricolor*	SSC	Open water with protected nesting substrate	P	Suitable habitat does exist adjacent to the project area. The species has the potential to occur within the project area, for foraging purposes. This species was observed incidentally within the project limits during biological and raptor surveys.
Mountain Plover	*Charadrius montanus*	SSC	Short grasslands, freshly plowed fields, newly sprouting grain fields and sometimes sod farms	HP	Suitable habitat exists adjacent to the project area. The species has low potential to occur within the project area, and was not observed during surveys.
Yellow Warbler	*Setophaga petechial*	SSC	Willow scrubs and thickets and other riparian plans including cottonwoods, sycamores, ash and alders	P	Suitable habitat exists within to the project area. The species has the potential to occur within the project area, and breeding pairs were observed incidentally during focused surveys.
Grasshopper Sparrow	*Ammodramus savannarum*	SSC	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area.
Loggerhead Shrike	*Lanius ludovicianus*	SSC	Valley foothills and lowlands, open cropland.	P	Suitable habitat exists within the project area. This species has potential to be within the project area. This species has been incidentally observed during focused surveys.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Species Present/ Absent	Rationale/Potential for Occurrence
Le Conte's thrasher	*Toxostoma lecontei*	SSC	Open habitats with scattered, low shrubs, saltbush and creosote bush flats	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area. However, none were found during focused survey efforts.
Tehachapi Pocket Mouse	*Perognathus alticolus inexpectatus*	S, SSC	Arid annual grassland and desert shrub communities	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area. However, none were found during focused survey efforts.
American Badger	*Taxidea taxus*	SSC	Drier open sages of must shrub, forest, and herbaceous habitats with friable soils	P	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area and was incidentally observed during focused surveys.
Pallid bat	*Antrozous pallidus*	SSC	Open, dry habitats with rocky areas, deserts, grasslands, shrublands, woodlands, and forests	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area. However, none were found during focused survey efforts.
Townsend's big-eared bat	*Corynorhinus towsendii*	SSC	Chaparral, woodlands, grasslands, desert scrub, and riparian areas	HP	Suitable habitat exists adjacent to the project area. However, none were found during focused survey efforts.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Species Present/ Absent	Rationale/Potential for Occurrence
Western Pond Turtle	*Emys marmorata*	S, SSC	Ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation below 6000 ft elevation	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area. This species was not incidentally observed during focused surveys.
Western Spadefoot Toad	*Spea hammondii*	SSC	Lowland washes, floodplains of rivers, alluvial fans, and alkali flats	HP	Potential habitat for this species occurs within the project area. However, due to drought conditions it was not observed during focused surveys.
Silvery Legless Lizard	*Anniella pulchara pulchara*	S, SSC	Sandy or loose loamy soils under sparse vegetation	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area.
Coast Horned Lizard	*Pharynosoma blainvilii*	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area.
Coastal Whiptail	*Adpidoscelis tigris stejnegeri*	SSC	Deserts and semi-arid areas that are sparsely vegetated and can also inhabit woodland and riparian habitats	HP	Suitable habitat does not exist adjacent to the project area. The species has the potential to occur within the project area.
Two-Striped Garter Snake	*Thamnophis hammondii*	S, SSC	Highly aquatic in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	HP	Suitable habitat exists adjacent to the project area. The species has the potential to occur within the project area.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Species Present/ Absent	Rationale/Potential for Occurrence
Haromonius halictid bee	*Haromonius halictid be*	CI	Foothills of San Bernardino County within buckwheat scrub plant communities	A	No habitat was observed within the project area during field surveys. The species is not expected to be present within the project area and therefore no effect on species.
Wasbauer's protodufourea bee	*Protodufourea wasbaueri*	DD	Chaparral and arid scrub areas within southern California and Arizona	A	No habitat was observed within the project area during field surveys. The species is not expected to be present within the project are

Source: Caltrans, Natural Environment Study Report, December 2016

Environmental Consequences
Each special-status species and the impacts to their potential habitat are included by alternative in Tables 126-128.

<u>Tricolored Blackbird (*Agelaius tricolor*)</u>
There is no protocol guidance for surveys conducted for this species. Tricolored blackbirds are known to forage within the project limits and are known to nest at Quail Lake and adjacent to the project limits at Holiday Lake. Tricolored blackbirds were observed foraging within the proposed project area and nesting colonies were observed at Quail Lake and Holiday Lake approximately 1.5 miles from the BSA. Through consultation with tricolored blackbird specialists, Dr. Robert J. Meese and Dr. Jonathan S. Feenstra of UC Davis Tricolored Blackbird Portal (2016), several locations were identified as important tricolored blackbird areas. Dr. Meese and Dr. Feenstra indicated that the nesting colonies at Holiday Lake is the largest and last nesting colony in Los Angeles County, and that efforts need to be made to ensure that the project does not impact the foraging habitat that those nesting colonies rely on for successful breeding seasons.

Emergent wetlands within Quail Lake are historically known nesting habitat for the tricolored blackbird and nesting was observed during 2014 biological surveys. Tricolored blackbirds were observed foraging and potentially nesting within the proposed project area and nesting colonies were observed within the vicinity of the BSA.

The proposed project does not contain critical habitat for the tricolored blackbird. Project related activities have the potential to permanently and temporarily impact suitable tricolored blackbird foraging habitat and nesting habitat. With the implementation of identified avoidance and minimization measures below, impacts to tricolored blackbird would not be substantial.

<u>Yellow Warbler (*Setophaga petechial*)</u>
Breeding individuals of this species were incidentally observed during surveys for the southwestern willow flycatcher, which followed the protocol outlined by Sogge *et al.* (2010). Qualified biologists performed five surveys during three survey periods; with two surveys occurring within each of the last two survey periods. The three survey periods were: Period 1- May 15 to 31, Period 2- June 1 to 24, and Period 3- June 25 to July 17.

The proposed project has the potential to have permanent impacts to suitable yellow warbler habitat. Suitable habitat within the BSA consist of Fremont cottonwood forest (*Populus fremontii*), black willow thickets (*Salix gooddingii*), sandbar willow thickets (*Salix exigua*), mulefat thickets (*Baccharis salicifolia*), and Baltic and Mexican rush marshes (*Juncus articus var. balticus, mexicanus*). With the implementation of avoidance and minimization measures, impacts yellow warbler are expected to be low.

<u>Grasshopper Sparrow (*Ammodramus savannarum*)</u>
Currently there is no protocol guidance for surveys conducted for this species. Surveys for this particular species did not occur, however they were observed incidentally during multiple biological surveys conducted for the proposed project. Potential habitat for the grasshopper sparrow can be found throughout the BSA. Grasshopper sparrows were observed foraging and potentially nesting within the proposed project area.

The proposed project does not contain critical habitat for the grasshopper sparrow. Project related activities have the potential to permanently impact suitable grasshopper sparrow breeding and foraging habitat. Avoidance and minimization measures would be implemented to minimize potential impacts to this species; as such, impacts to the grasshopper sparrow are expected to be low.

Loggerhead Shrike (*Lanius ludovicianus*)
Currently there is no protocol guidance for surveys conducted for this species. Surveys for this particular species did not occur, however they were observed incidentally during multiple biological surveys conducted for the proposed project. Potential habitat for the loggerhead shrike can be found throughout the BSA. Loggerhead shrikes were observed foraging and potentially nesting within the proposed project area.

The proposed project does not contain critical habitat for the loggerhead shrike. Project related activities have the potential to permanently impact suitable loggerhead shrike habitat. Avoidance and minimization measures would be implemented to minimize potential impacts to this species; as such, impacts to the loggerhead shrike are expected to be low.

Golden Eagle (*Aquila chrysaetos*)
Suitable foraging habitat does occur within the eastern portion of the BSA. Raptor surveys were conducted by Caltrans biologists throughout 2015, including during known breeding periods. Golden eagles were observed perched on high power line facilities within the BSA and surrounding areas as incidental observations to other 2015 biological surveys. This species was also observed adjacent to the project limits during raptor surveys. Suitable nesting sites do not exist within the BSA. For more detail of these occurrences, please refer to the Raptor Survey Reports, Appendix H.

The proposed project has the potential to have permanent impacts to suitable golden eagle foraging habitat, with roughly 3,768.30 acres of the BSA containing suitable raptor foraging habitat. Foraging habitat within the BSA consist of allscale (*Atriplex polycarpa*) scrub, fourwing saltbush (*Atriplex canescens)* scrub, big sagebrush (*Artemisia tridentate*), Mojave mixed woody scrub, California buckwheat (*Eriogonum fasciculatum*) scrub, rubber rabbitbrush (*Ericameria nauseaosa*) scrub, fallow agriculture, cheatgrass (*Bromus tectorum*) grassland, disturbed, and active agriculture. The proposed clearing and removal limits would not destroy or modify designated critical habitat for the golden eagle. Due to the specific nesting requirements of the golden eagle it is highly unlikely that they would be found nesting within or adjacent to the proposed project area. With incorporation of avoidance and minimization measures, impacts would not be substantial.

Burrowing owl (*Athene cunicularia*)
This species traditionally occurs within open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. They are subterranean nesters which are dependent on burrowing mammals, such as the California ground squirrel, for nesting sites. The proposed project area is located in the known breeding range of this species and potential habitat for burrowing owls throughout the BSA.

Suitable burrowing owl habitat was found to occur throughout a majority of the proposed project area. A burrowing owl habitat assessment was conducted in June of 2015 and 2016 A burrowing owl habitat assessment assists in providing information on where suitable, marginal, and unsuitable habitat for the BUOW occurs within and adjacent to the Project corridor. Prior to conducting the field study, a review of

California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) and CDFW's Biogeographic Information and Observation System (BIOS), and reviewed incidental data. Following completion of the literature review, biologists who are familiar with burrowing owl habitat, behavior, sign, and vocalizations conducted the BUOW habitat assessment for the proposed Project. The biologists conducted the habitat assessment in accordance with the Staff Report on Burrowing Owl Mitigation (CDFW 2012). The biologists assessed the proposed Project corridor, along with a 492 foot (150m) buffer, from the eastern end of the Project corridor (just east of the SR-138/14 intersection) to the western end of the Project corridor (intersection of Interstate 5 and SR-138; BUOW Study Area). The biologists used a combination of stopping along existing access roads and assessing areas on foot to characterize and map the vegetation communities and assess the habitat for BUOW based on the guidelines listed below. Vegetation community type descriptions followed the designations in Sawyer et al. (2009) and Holland (1986). The vegetation communities within the Project corridor had previously been documented (ECORP 2014), however the communities within 150 m of the Project corridor boundaries had not. Using the aerial imagery map, the biologists drew in the major vegetation communities and their interfaces in the BUOW Study Area, to later be digitized using GIS software. Burrows encountered during the assessment were inspected for presence of owls and owl sign (feathers, whitewash, and pellets). Potential burrows and owl locations were mapped utilizing a global positioning system (GPS) unit. The biologists determined habitat suitability based on the natural history, habitat requirements, and the currently-documented range boundaries of the BUOW.

This habitat assessment found that of the 4,522 acres which compromise the BSA, 3,837 acres are suitable habitat for burrowing owl, or roughly 85%. Multiple individuals, pellets, and active burrows were observed throughout the project site during the burrowing owl habitat assessment and during desert tortoise surveys. Protocol level burrowing owl surveys were performed in the spring and summer of 2016, to gain a more accurate number of individuals and territories within the project site.

The proposed project has the potential to have permanent impacts to suitable burrowing owl habitat, with roughly 85% of the BSA containing suitable habitat for burrowing owl. Protocol level surveys for burrowing owl would be performed prior to construction to get an exact count of individuals, occupied burrows, and nest fecundity. With the incorporation of avoidance and minimization measures for this species discussed below, impacts would not be substantial.

Acceptable mitigation for impacts to a burrowing owl breeding pair would be to preserve suitable habitat and manage it for the benefit of burrowing owl in perpetuity. CDFW guidelines suggest that such land should be of similar type and of equal or greater quality to ensure a no net loss.

Northern Harrier (*Circus cyancus*)

Suitable northern harrier habitat was found to occur throughout the proposed project area. Raptor surveys were conducted by Caltrans biologists throughout 2015, including during known breeding periods. A single occurrence of northern harrier was observed during focused raptor surveys within three miles of the project limits and they were incidentally observed during preparation of the 2014 Wildlife Movement Study Report. (For more details, please refer to the Raptor Survey Report, Appendix H, and Appendix G of the Wildlife Movement Study Report).

The proposed project has the potential to have permanent impacts to suitable raptor foraging habitat, with roughly 3,768.30 acres of the BSA containing suitable foraging habitat for raptors. Foraging habitat within the BSA consist of allscale (*Atriplex polycarpa*) scrub, fourwing saltbush (*Atriplex canescens)* scrub, big sagebrush (*Artemisia tridentate*), Mojave mixed woody scrub, California buckwheat (*Eriogonum fasciculatum*) scrub, rubber rabbitbrush (*Ericameria nauseaosa*) scrub, fallow agriculture, cheatgrass (*Bromus tectorum*) grassland, disturbed, and active agriculture. The proposed clearing and removal limits would not destroy or modify designated critical habitat for any northern harrier. With incorporation of avoidance and minimization measures, impacts would not be substantial.

White-Tailed Kite (*Elanus leucurus*)

Suitable white-tail kite habitat was found to occur within the proposed project area. Raptor surveys were conducted throughout 2015, including during known breeding periods. This species was not observed during focused raptor surveys or within three miles of the BSA. For more details, please refer to the Raptor Survey Report, Appendix H of the NES.

The proposed project has the potential to have permanent impacts to suitable raptor foraging habitat, with roughly 3,768.30 acres of the BSA containing suitable foraging habitat for raptors. Foraging habitat within the BSA consist of allscale (*Atriplex polycarpa*) scrub, fourwing saltbush (*Atriplex canescens)* scrub, big sagebrush (*Artemisia tridentate*), Mojave mixed woody scrub, California buckwheat (*Eriogonum fasciculatum*) scrub, rubber rabbitbrush (*Ericameria nauseaosa*) scrub, fallow agriculture, cheatgrass (*Bromus tectorum*) grassland, disturbed, and active agriculture. The proposed clearing and removal limits would not destroy or modify designated critical habitat for the white-tailed kite. With incorporation of avoidance and minimization measures, impacts would not be substantial.

Peregrine Falcon (*Falco pergrines*)

Suitable peregrine falcon habitat was found to occur throughout the proposed project area. Raptor surveys were conducted throughout 2015, including during known breeding periods. This species was observed during focused raptor surveys in 2014 within the project limits. For more details, please refer to the Raptor Survey Report, Appendix H of the NES.

The proposed project has the potential to have permanent impacts to suitable raptor foraging habitat, with roughly 3,768.30 acres of the BSA containing suitable foraging habitat for raptors. Foraging habitat within the BSA consist of allscale (*Atriplex polycarpa*) scrub, fourwing saltbush (*Atriplex canescens)* scrub, big sagebrush (*Artemisia tridentata*), Mojave mixed woody scrub, California buckwheat (*Eriogonum fasciculatum*) scrub, rubber rabbitbrush (*Ericameria nauseaosa*) scrub, fallow agriculture, cheatgrass (*Bromus tectorum*) grassland, disturbed, and active agriculture. With incorporation of avoidance and minimization measures, impacts would not be substantial.

Western Pond Turtle (*Emys marmorata*)

Suitable habitat for this species occurs within Quail Lake, at the western end of the BSA. Surveys for this particular species did not occur, and they were not incidentally observed during biological surveys for conducted for the proposed project. Individuals of this species are known to exist within the BSA. With the implementation of identified avoidance and minimization measures below, impacts to western pond turtle would not be substantial.

Western Spadefoot Toad (*Spea hammondii*)

Surveys for the western spadefoot toad took place in the spring of 2014, and were conducted as part of the Special Status Amphibian Habitat Assessment and Surveys Report. A qualified biologist performed a habitat assessment for the western spadefoot toad and found ten locations with surface water with the potential for western spadefoot toad occurrences. Please see Appendix N of the Natural Environment

Study, the Special Status Amphibian Habitat Assessment and Surveys Report for further details and maps of these locations.

Biologists conducted a total of four presence/absence surveys for the western spadefoot toad from March 26 to May 22, 2014. Surveys occurred during the appropriate weather conditions for western spadefoot toad identification. Despite the presence of suitable habitat, hibernating and foraging habitat, no western spadefoot toads were observed or detected within the BSA. Surveys conducted for this species were conducted within a drought year, which should be taken into consideration. Drought conditions create limited occurrences of surface water, which is a key component in western spadefoot breeding and foraging. Habitat features associated with this species were observed within the BSA, further surveys are anticipated prior to construction to determine the presence/absence of the western spadefoot toad within the BSA. With incorporation of avoidance and minimization measures below, impacts to this species would not be substantial.

Silvery Legless Lizard (*Anniella pulchara pulchara*)
Potential habitat for the silvery legless lizard occurs throughout the BSA. Currently there is no protocol guidance for surveys conducted for this species. Surveys for this particular species did not occur, due to their subterranean nature positive identification can be exceedingly difficult. However, suitable habitat for this species occurs throughout the proposed project area and CNDDB occurrences have been recorded within the BSA.

Project related activities have the potential to permanently impact suitable silvery legless lizard habitat. Avoidance and minimization measures would be implemented to minimize potential impacts to individuals of this species; as such, impacts to the silvery legless lizard are expected to be low.

Coast Horned Lizard (*Pharynosoma blainvilii*)
The coast horned lizard is listed by CDFW as a Species of Special Concern, and can be found residing within lowlands along sandy washes with scattered low bushes. Within the proposed project limits, coast horned lizard habitat consists of valley foothill hardwoods, juniper and annual grassland, with friable soils. Individuals of this species are known to exist within the BSA and surrounding region.

Potential habitat for the coast horned lizard occurs throughout the BSA, mainly near washes with friable soils. Surveys for this particular species did not occur, however they were observed incidentally during biological surveys conducted for the proposed project. CNDDB records for the proposed project area include recent observations of coast horned lizard within the BSA.

Project related activities have the potential to permanently impact suitable coast horned lizard habitat. Avoidance and minimization measures will be implemented to minimize potential impacts to this species; as such, impacts to individuals of this species are expected to be low.

Coastal Whiptail (*Aspidoscelis tigris stejnegeri*)
Potential habitat for the coastal whiptail occurs throughout the BSA, mainly near Gorman Post Road which includes grassland and riparian habitats. Surveys for this particular species did not occur, and they were not observed incidentally during biological surveys conducted for the proposed project. The only CNDDB record for the proposed project area includes a single observation of coast horned lizard near Gorman Post Road in 1994.

Project related activities have the potential to permanently impact suitable coastal whiptail habitat. Avoidance and minimization measures will be implemented to minimize potential impacts to this species; as such, impacts to individuals of this species are expected to be low.

<u>Two-Striped Garter Snake (*Thamnophis hammondii*)</u>
Potential habitat for the two-striped garter snake occurs within the BSA, mainly near Quail Lake, as well as drainages and washes inundated with permanent water. Currently survey protocol for this species does not exist, and individuals of this species were not incidentally observed during the many biological surveys conducted for this project. Surveys for this particular species did not occur, however CNDDB records for the proposed project area include recent observations of two-striped garter snakes within the vicinity of the BSA.

Project related activities have the potential to permanently impact suitable two-striped garter snake habitat. Avoidance and minimization measures will be implemented to minimize potential impacts to this species; as such, impacts to individuals of this species are not expected to occur.

<u>Tehachapi Pocket Mouse (*Perognathus alticolus inexpectatus*)</u>
Suitable Tehachapi pocket mouse habitat was found to occur within the western end of the proposed project area. Preliminary nocturnal small mammal investigations were conducted in the spring of 2014 and 2015. Based on a habit assessment for sensitive rodents, nine trapping grids were identified as having potential for positive occurrences. There is no survey protocol for the Tehachapi pocket mouse, however there are protocols for closely related species, such as Fresno kangaroo rat (*Dipodomys nitratoides exilis*). Qualified biologists used the generally recommended trapping protocols for closely related species to structure the 2014 and 2015 survey efforts. Trapping was conducted by permitted biologists and consisted of 100 traps arranged in four lines of 25 traps each. For the spring 2014 surveys three consecutive nights of trapping was conducted, and in 2015 that was augmented to five consecutive nights to increase the likelihood of recapture. For further survey details and gird locations please refer to the Preliminary Nocturnal Small Mammal Investigations, Appendix L of the NES.

A combination of eleven species of small mammals were captured during the Spring 2014 and Spring 2015 surveys. These species included; San Joaquin pocket mouse (*Perognathus inornatus*), long-tailed pocket mouse (*Chaetodipus formosus*), California pocket mouse (*Chaetodipus californicus*), Pacific kangaroo rat (*Dipodomys agilis*), Panamint kangaroo rat (*Dipodomys panamintinus*), California vole (*Microtus californicus*), Bryant's woodrat (*Neotoma bryanti*), deer mouse (*Peromyscus maniculatus*), pinyon mouse (*Peromyscus truei*), western harvest mouse (*Reithrodontomys megalotis*), and California ground squirrel (*Spermophilus beecheyi*). Tehachapi pocket mouse was not captured or incidentally observed in either surveys conducted for the proposed project. However, due to the investigative nature of the 2014 and 2015 studies, the potential for its occurrence within the proposed project limits cannot be discounted.

The proposed project has the potential to have permanent impacts to potentially suitable Tehachapi pocket mouse habitat, which extends from the western end of the project area to about 175th Street West. This habitat is comprised of Joshua tree woodland (*Yucca brevifolia*), California juniper woodland, interior live oak chaparral (*Quercus wislizeni*), Baltic/Mexican rush marshes (*Juncus balticus, J. mexicanus*), Mojave mixed woody scrub, rubber rabbitbrush scrub, fallow agriculture, and cheatgrass grassland. With additional preconstruction surveys and the implementationavoidance and minimization measures, impacts to individuals of this species woud not be substantial.

American Badger (*Taxidea taxus*)

Potential habitat for the American badger occurs throughout the BSA. Currently there is no protocol guidance for surveys conducted for this species. Surveys for this particular species did not occur, however they were observed incidentally during multiple biological surveys conducted for the proposed project. American badgers and their sign were observed within the proposed project area.

Project related activities have the potential to permanently impact suitable American badger habitat. With the implementation of identified avoidance and minimization measures below, impacts would not be substantial.

Desert Kitfox *(Vulpes macrotis arsipus)*

Focused surveys for desert kit fox dens were performed within the current study limits and 100 foot buffer, which is recommended buffer distance for known dens listed in the United States Fish and Wildlife Service (USFWS) *Standardized Recommendations for protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS 2011). Desert kit fox dens were categorized into three categories: potential den, known den, and natal/pupping den.

The Preferred Alternative will have direct impacts to both potential and known dens. The Preferred Alternative will not directly impact either of the two natal/pupping dens, but there is potential for indirect impacts to the natal/pupping dens. Natal/pupping Den 42 is located approximately 10 ft. south of the temporary impacts boundary and approximately 120 ft. south of the permanent impacts boundary for Alternative 2. Natal/pupping Den 49 is located approximately 50 ft. south of the temporary impacts boundary and approximately 55 ft. south of the permanent impact boundary for the Preferred Alternative. Due to the close proximity of these dens to the construction limits, there is potential for indirect impacts to the natal/pupping dens, including disturbance from increased noise, vibration, and human presence. No direct impacts to natal/pupping dens are an anticipated, but there is potential for indirect impacts to the two natal/pupping dens (Den 42 and 49) due to their close proximity to the impact areas. With the incorporation of identified avoidance and minimization measures below, impacts to this species would not be substantial.

Table 130: Preferred Alternative Impacts to Desert Kit Fox Dens

Desert Kit Fox Feature	Impact Area		Total
	Permanent	Temporary	
Potential Den (no sign)	21	15	36
Known Den (with sign)	2	0	2
Natal/Pupping Den	0	0	0
Total	**23**	**15**	**38**

Source: Caltrans, Natural Environment Study Report, December 2016

Monarch butterfly (*Danaus plexippus plexippus)*

The monarch butterfly (*Danaus plexippus plexippus*) is currently under federal review for listing status under the ESA. During vegetation surveys, both desert milkweed (*Asclepias erosa*) and narrow-leaf milkweed (*Asclepias fascicularis*) were found in areas within the project limits. Since milkweed acts exclusively as the host plant for monarch butterfly larvae, particular effort should be made to translocate populations of milkweed that are observed within the permanent impact zones of the project limits. In the event the monarch butterfly receives listing status, attempts should be made to conserve both the butterfly and the host plant it relies on. Conserving and/or planting milkweed is compatible with Visual Resource requirements, Section 3.1.7.

Focused surveys for monarch butterflies were not conducted, however monarch butterflies and monarch caterpillars were observed incidentally during other biological surveys and monarch butterflies and monarch caterpillars were observed occurring within and adjacent to Quail Lake.

Project related activities have the potential to permanently impact suitable monarch butterfly habitat. Avoidance and minimization measures will be implemented to minimize potential impacts to this species; as such, direct impacts to the monarch butterfly are not expected to occur.

Table 131: Estimated Impacts to Special-Status Wildlife Species - Alternative 1

Vegetation Community	Fremont Cottonwood Forest (FCF)*	Joshua Tree Woodland (JT) in SEA*	Joshua Tree Woodland (JT) not in SEA	California Juniper Woodland (CJW)	Interior Live Oak Chaparral (OAK)	Scrub Oak Chaparral (SOC)	Open Water (WTR)	Black Willow Thickets (BWT)*	Sandbar Willow Thickets (SWT)*	Mulefat Thickets (MT)
Total Acreage in Project Corridor Study Area	11.88	18.88	10.35	112.88	7.01	10.49	11.44	1.75	7.34	0.52
Alt 1 Permanent Acres	0.59	5.87	0.84	34.53	1.24	0.89	0.64	0.00	0.40	0.00
Alt 1 Temporary Acres	11.29	13.01	9.51	78.35	5.78	9.60	10.81	1.75	6.94	0.52
Golden Eagle	x	x	x	x	x	x				
Burrowing Owl		x	x	x						
Northern Harrier				x				x	x	x
White-Tailed Kite	x				x	x		x	x	x
Peregrine Falcon	x	x	x	x			x	x	x	x
Tricolored Blackbird	x						x	x	x	x
Mountain Plover										
Yellow Warbler	x							x	x	x
Grasshopper Sparrow										
Loggerhead Shrike	x						x	x	x	x
Tehachapi Pocket Mouse		x	x	x						
American Badger		x	x		x	x		x	x	x
Western Pond Turtle							x			
Western Spadefoot Toad							x			
Silvery Legless Lizard										
Coast Horned Lizard	x			x	x	x				
Two-Striped Garter Snake	x						x	x	x	x
Coastal Whiptail										
San Emigdio blue butterfly										
Haromonius halictid bee										
Wasbauer's protodufourea bee					x	x				
Monarch butterfly										
Desert kitfox		x	x	x						

Table 131: Estimated Impacts to Special-Status Wildlife Species - Alternative 1 Continued

Vegetation Community	Baltic/Mexican Rush Marshes (BMRM)	Allscale Scrub (AS)	Fourwing Saltbush Scrub (FWS)	Big Sagebrush (BS)	Mojave Mixed Woody Scrub (MMWS)	California Buckwheat Scrub (CBS)	Rubber Rabbitbrush Scrub (RBS)	Fallow Agriculture (F-AGR)	Cheatgrass Grassland (NNG)	Tamarisk Thickets (TT)	Pine Windrows (PW)
Total Acreage in Project Corridor Study Area	17.67	503.74	0.25	4.56	49.20	1.69	1890.26	617.82	332.33	1.27	0.66
Alt 1 Permanent Acres	0.15	96.12	0.00	0.66	0.00	0.00	388.34	72.92	97.50	0.86	0.00
Alt 1 Temporary Acres	17.52	407.62	0.25	3.90	49.20	1.69	1501.92	544.90	234.83	0.41	0.66
Golden Eagle					x						x
Burrowing Owl		x	x	x	x	x	x	x	x		
Northern Harrier	x	x	x						x		
White-Tailed Kite			x						x		
Peregrine Falcon	x	x	x		x	x	x				
Tricolored Blackbird	x							x	x		
Mountain Plover									x		
Yellow Warbler	x										
Grasshopper Sparrow									x		
Loggerhead Shrike	x										
Tehachapi Pocket Mouse		x	x	x	x	x	x		x		
American Badger	x	x	x	x	x		x		x		
Western Pond Turtle											
Western Spadefoot Toad											
Silvery Legless Lizard				x							
Coast Horned Lizard				x							
Two-Striped Garter Snake	x										
Coastal Whiptail		x	x		x		x				
San Emigdio blue butterfly			x								
Haromonius halictid bee						x					
Wasbauer's protodufourea bee			x	x	x		x				
Monarch butterfly	x										
Desert kitfox		x	x	x	x	x	x	x	x		

Table 131: Estimated Impacts to Special-Status Wildlife Species - Alternative 1 Continued

Vegetation Community	Disturbed (DIS)	Active Agriculture (A-AGR)	Developed (DEV)	Total	Species Total	Species Perm Total	Species Temp Total
Total Acreage in Project Corridor Study Area	301.48	60.03	562.81	**4536.31**			
Alt 1 Permanent Acres	48.41	9.29	82.56	**841.81**			
Alt 1 Temporary Acres	253.07	50.74	480.25	**3694.52**			
Golden Eagle			x		784.16	126.52	657.65
Burrowing Owl	x				3843.44	745.19	3098.25
Northern Harrier					976.48	228.70	747.78
White-Tailed Kite					371.57	100.62	270.96
Peregrine Falcon	x		x		3502.14	658.45	2843.70
Tricolored Blackbird		x			1060.78	181.49	879.30
Mountain Plover		x			392.36	106.79	285.57
Yellow Warbler					39.16	1.14	38.02
Grasshopper Sparrow					332.33	97.50	234.83
Loggerhead Shrike		x			110.63	11.07	99.57
Tehachapi Pocket Mouse					2924.14	623.86	2300.28
American Badger					2854.35	592.01	2262.35
Western Pond Turtle					11.44	0.64	10.81
Western Spadefoot Toad					11.44	0.64	10.81
Silvery Legless Lizard					4.56	0.66	3.90
Coast Horned Lizard					146.82	37.91	108.92
Two-Striped Garter Snake					50.60	1.78	48.83
Coastal Whiptail					2443.45	484.46	1958.99
San Emigdio blue butterfly					0.25	0.00	0.25
Haromonius halictid bee					1.69	0.00	1.69
Wasbauer's protodufourea bee					1961.77	391.13	1570.65
Monarch butterfly					17.67	0.15	17.52
Desert kitfox	x				3843.44	745.19	3098.25

Table 132: Estimated Impacts to Special-Status Wildlife Species - Alternative 1 with Bypass

Vegetation Community	Fremont Cottonwood Forest (FCF)*	Joshua Tree Woodland (JT) in SEA*	Joshua Tree Woodland (JT) not in SEA	California Juniper Woodland (CJW)	Interior Live Oak Chaparral (OAK)	Scrub Oak Chaparral (SOC)	Open Water (WTR)	Black Willow Thickets (BWT)*	Sandbar Willow Thickets (SWT)*	Mulefat Thickets (MT)	Baltic/Mexican Rush Marshes (BMRM)	Allscale Scrub (AS)
Total Acreage in Project Corridor Study Area	11.88	18.88	10.35	112.88	7.01	10.49	11.44	1.75	7.34	0.52	17.67	503.74
Alternative 1 with bypass Permanent Acres	0.59	5.87	0.84	34.53	1.24	0.89	0.64	0.00	0.40	0.00	0.15	96.12
Alternative 1 with bypass Temporary Acres	11.29	13.01	9.51	78.35	5.78	9.60	10.81	1.75	6.94	0.52	17.52	407.62
Golden Eagle	x	x	x	x	x	x						
Burrowing Owl		x	x	x								x
Northern Harrier				x				x	x	x	x	x
White-Tailed Kite	x				x	x		x	x	x		
Peregrine Falcon	x	x	x	x			x	x	x	x	x	x
Tricolored Blackbird	x						x	x	x	x	x	
Mountain Plover												
Yellow Warbler	x							x	x	x	x	
Grasshopper Sparrow												
Loggerhead Shrike	x						x	x	x	x	x	
Tehachapi Pocket Mouse		x	x	x								x
American Badger		x	x		x	x		x	x	x	x	x
Western Pond Turtle							x					
Western Spadefoot Toad							x					
Silvery Legless Lizard												
Coast Horned Lizard	x			x	x	x						
Two-Striped Garter Snake	x						x	x	x	x	x	
Coastal Whiptail												x
San Emigdio blue butterfly												
Haromonius halictid bee												
Wasbauer's protodufourea bee					x	x						
Monarch butterfly											x	

Table 132: Estimated Impacts to Special-Status Wildlife Species - Alternative 1 with Bypass

Vegetation Community	Fourwing Saltbush Scrub (FWS)	Big Sagebrush (BS)	Mojave Mixed Woody Scrub (MMWS)	California Buckwheat Scrub (CBS)	Rubber Rabbitbrush Scrub (RBS)	Fallow Agriculture (F-AGR)	Cheatgrass Grassland (NNG)	Tamarisk Thickets (TT)	Pine Windrows (PW)	Disturbed (DIS)	Active Agriculture (A-AGR)	Developed (DEV)
Total Acreage in Project Corridor Study Area	0.25	4.56	49.20	1.69	1890.26	617.82	332.33	1.27	0.66	301.48	60.03	562.81
Alternative 1 with bypass Permanent Acres	0.00	0.66	0.00	0.00	388.34	72.92	97.50	0.86	0.00	48.41	9.29	82.56
Alternative 1 with bypass Temporary Acres	0.25	3.90	49.20	1.69	1501.92	544.90	234.83	0.41	0.66	253.07	50.74	480.25
Golden Eagle			x						x			x
Burrowing Owl	x	x	x	x	x	x	x			x		
Northern Harrier	x						x					
White-Tailed Kite	x						x					
Peregrine Falcon	x		x	x	x					x		x
Tricolored Blackbird						x	x				x	
Mountain Plover							x				x	
Yellow Warbler												
Grasshopper Sparrow							x					
Loggerhead Shrike											x	
Tehachapi Pocket Mouse	x	x	x	x	x		x					
American Badger	x	x	x		x		x					
Western Pond Turtle												
Western Spadefoot Toad												
Silvery Legless Lizard		x										
Coast Horned Lizard		x										
Two-Striped Garter Snake												
Coastal Whiptail	x		x		x							
San Emigdio blue butterfly	x											
Haromonius halictid bee				x								
Wasbauer's protodufourea bee	x	x	x		x							
Monarch butterfly												

Table 132: Estimated Impacts to Special-Status Wildlife Species - Alternative 1 with Bypass

Vegetation Community	Total	Species Total	Species Perm Total	Species Temp Total
Total Acreage in Project Corridor Study Area	4536.31			
Alternative 1 with bypass Permanent Acres	841.81			
Alternative 1 with bypass Temporary Acres	3694.52			
Golden Eagle		784.16	126.52	657.65
Burrowing Owl		3843.44	745.19	3098.25
Northern Harrier		976.48	228.70	747.78
White-Tailed Kite		371.57	100.62	270.96
Peregrine Falcon		3502.14	658.45	2843.70
Tricolored Blackbird		1060.78	181.49	879.30
Mountain Plover		392.36	106.79	285.57
Yellow Warbler		39.16	1.14	38.02
Grasshopper Sparrow		332.33	97.50	234.83
Loggerhead Shrike		110.63	11.07	99.57
Tehachapi Pocket Mouse		2924.14	623.86	2300.28
American Badger		2854.35	592.01	2262.35
Western Pond Turtle		11.44	0.64	10.81
Western Spadefoot Toad		11.44	0.64	10.81
Silvery Legless Lizard		4.56	0.66	3.90
Coast Horned Lizard		146.82	37.91	108.92
Two-Striped Garter Snake		50.60	1.78	48.83
Coastal Whiptail		2443.45	484.46	1958.99
San Emigdio blue butterfly		0.25	0.00	0.25
Haromonius halictid bee		1.69	0.00	1.69
Wasbauer's protodufourea bee		1961.77	391.13	1570.65
Monarch butterfly		17.67	0.15	17.52

Table 133: Estimated Impacts to Special-Status Wildlife Species - Alternative 2

Vegetation Community	Fremont Cottonwood Forest (FCF)*	Joshua Tree Woodland (JT) in SEA*	Joshua Tree Woodland (JT) not in SEA	California Juniper Woodland (CJW)	Interior Live Oak Chaparral (OAK)	Scrub Oak Chaparral (SOC)	Open Water (WTR)	Black Willow Thickets (BWT)*	Sandbar Willow Thickets (SWT)*	Mulefat Thickets (MT)	Baltic/Mexican Rush Marshes (BMRM)
Total Acreage in Project Corridor Study Area	11.88	18.88	10.35	112.88	7.01	10.49	11.44	1.75	7.34	0.52	17.67
Alternative 2 Permanent Acres	0.59	1.18	0.67	18.20	1.24	0.89	0.65	0.00	0.40	0.00	0.15
Alternative 2 Temporary Acres	11.28	17.70	9.60	94.68	5.77	9.60	10.80	1.75	6.94	0.52	17.52
Golden Eagle	x	x	x	x	x	x					
Burrowing Owl		x	x	x							
Northern Harrier				x				x	x	x	x
White-Tailed Kite	x				x	x		x	x	x	
Peregrine Falcon	x	x	x	x			x	x	x	x	x
Tricolored Blackbird	x						x	x	x	x	x
Mountain Plover											
Yellow Warbler	x							x	x	x	x
Grasshopper Sparrow											
Loggerhead Shrike	x						x	x	x	x	x
Tehachapi Pocket Mouse		x	x	x							
American Badger		x	x		x	x		x	x	x	x
Western Pond Turtle							x				
Western Spadefoot Toad							x				
Silvery Legless Lizard											
Coast Horned Lizard	x			x	x	x					
Two-Striped Garter Snake	x						x	x	x	x	x
Coastal Whiptail											
San Emigdio blue butterfly											
Haromonius halictid bee											
Wasbauer's protodufourea bee					x	x					
Monarch butterfly											x

Table 133: Estimated Impacts to Special-Status Wildlife Species - Alternative 2 Continued

Vegetation Community	Allscale Scrub (AS)	Fourwing Saltbush Scrub (FWS)	Big Sagebrush (BS)	Mojave Mixed Woody Scrub (MMWS)	California Buckwheat Scrub (CBS)	Rubber Rabbitbrush Scrub (RBS)	Fallow Agriculture (F-AGR)	Cheatgrass Grassland (NNG)	Tamarisk Thickets (TT)	Pine Windrows (PW)	Disturbed (DIS)
Total Acreage in Project Corridor Study Area	503.74	0.25	4.56	49.20	1.69	1890.26	617.82	332.33	1.27	0.66	301.48
Alternative 2 Permanent Acres	42.14	0.00	0.17	0.00	0.00	250.36	42.59	74.58	0.17	0.00	37.82
Alternative 2 Temporary Acres	461.60	0.25	4.38	49.20	1.69	1639.90	575.23	257.75	1.10	0.66	263.66
Golden Eagle				x						x	
Burrowing Owl	x	x	x	x	x	x	x	x			x
Northern Harrier	x	x						x			
White-Tailed Kite		x						x			
Peregrine Falcon	x	x		x	x	x					x
Tricolored Blackbird							x	x			
Mountain Plover								x			
Yellow Warbler											
Grasshopper Sparrow								x			
Loggerhead Shrike											
Tehachapi Pocket Mouse	x	x	x	x	x	x		x			
American Badger	x	x	x	x		x		x			
Western Pond Turtle											
Western Spadefoot Toad											
Silvery Legless Lizard			x								
Coast Horned Lizard			x								
Two-Striped Garter Snake											
Coastal Whiptail	x	x		x		x					
San Emigdio blue butterfly		x									
Haromonius halictid bee					x						
Wasbauer's protodufourea bee		x	x	x		x					
Monarch butterfly											

Table 133: Estimated Impacts to Special-Status Wildlife Species - Alternative 2 Continued

Vegetation Community	Active Agriculture (A-AGR)	Developed (DEV)	Total	Species Total	Species Perm Total	Species Temp Total
Total Acreage in Project Corridor Study Area	60.03	562.81	**4536.31**			
Alternative 2 Permanent Acres	8.89	89.76	**570.45**			
Alternative 2 Temporary Acres	51.14	473.04	**3965.76**			
Golden Eagle		x		784.16	112.53	671.53
Burrowing Owl				3843.44	467.71	3375.64
Northern Harrier				976.48	135.47	841.01
White-Tailed Kite				371.57	77.70	293.86
Peregrine Falcon		x		3502.14	441.92	3060.13
Tricolored Blackbird	x			1060.78	127.85	932.93
Mountain Plover	x			392.36	83.47	308.89
Yellow Warbler				39.16	1.14	38.01
Grasshopper Sparrow				332.33	74.58	257.75
Loggerhead Shrike	x			110.63	10.68	99.95
Tehachapi Pocket Mouse				2924.14	387.30	2536.75
American Badger				2854.35	371.78	2482.48
Western Pond Turtle				11.44	0.65	10.80
Western Spadefoot Toad				11.44	0.65	10.80
Silvery Legless Lizard				4.56	0.17	4.38
Coast Horned Lizard				146.82	21.09	125.71
Two-Striped Garter Snake				50.60	1.79	48.81
Coastal Whiptail				2443.45	292.50	2150.95
San Emigdio blue butterfly				0.25	0.00	0.25
Haromonius halictid bee				1.69	0.00	1.69
Wasbauer's protodufourea bee				1961.77	252.66	1709.10
Monarch butterfly				17.67	0.15	17.52

Cumulative Impacts

Health and Historical Context

The project corridor is situated on the north side of the San Gabriel Mountains, largely within the Antelope Valley that comprises the western Mojave Desert, and south of the Tehachapi Mountains. The majority of the eastern portion of the project corridor largely comprises vegetation communities characteristic of the Mojave Desert, whereas the western one-third of the project corridor represents a transition zone between desert, foothill and montane environments. This portion of the project corridor contains a high level of species diversity due to the convergence of these three geographic regions.

The Antelope Valley Region is characterized by creosote bush and saltbush plant communities which make up approximately 75 percent of the natural lands in the Western Mojave Desert. A small percentage of natural lands in the area can be characterized as Mojave mixed woody scrub community. A very small percentage of the Antelope Valley Region could be characterized as freshwater or alkali wetlands (Bureau of Land Management [BLM] 2005).

The region is generally flat and sparsely vegetated, but is interspersed with buttes, mountain ranges, and dry lakes (BLM 2005). The Fairmont and Antelope buttes represent a unique habitat due to their location, as the most westerly buttes of the Mojave Desert and their close proximity to several geographic regions. The Fairmont and Antelope buttes provide vital habitat to many wide ranging species, which forage in outlying habitat, but use the buttes for nesting, roosting, denning, and refuge. The buttes also serve as concentrated wintering grounds for birds of prey, which are rare in the County, and which forage on grassland and agricultural fields in the vicinity.

The Antelope Valley has a wide range of raptors that depend on the valley for breeding and foraging habitat. High quality raptor foraging and nesting habitat in the region is abundant. The project limits consist of open and disturbed areas which are considered suitable habitat for common raptor species and special-status raptor species. The project limits have high levels of disturbance due to the existing highway, fallow agricultural activity and new solar farms. The adjacent open space creates a potential for nesting and foraging for raptors.

Reasonably Foreseeable Actions and Their Impacts

Table 134 lists the past, present, and reasonably foreseeable actions with potential to impact the special status wildlife species discussed in the above Environmental Consequences discussion of Section 3.3.4 Animal Species. The table also includes estimated impact acreages associated with habitat loss for each project listed, if available.

Table 134: Estimated Impacts to Special-Status Wildlife Species Associated with Reasonably Foreseeable Actions

Project	Special Status Wildlife Species	Habitat Acres
California High Speed Train System	Golden Eagle Northern Harrier Tricolored Blackbird Loggerhead Shrike Tehachapi Pocket Mouse Western Pond Turtle Western Spadefoot Toad Silvery Legless Lizard Two-Striped Garter Snake	238
High Desert Corridor	Golden Eagle Burrowing Owl Northern Harrier Tricolored Blackbird Mountain Plover Yellow Warbler Loggerhead Shrike American Badger Silvery Legless Lizard Coast Horned Lizard	9048
West Antelope Solar	Northern Harrier Tricolored Blackbird American Badger	76
AV Solar Ranch One	Golden Eagle Burrowing Owl Tricolored Blackbird Loggerhead Shrike American Badger Coast Horned Lizard	1937

Alpine Solar Project	Golden Eagle Burrowing Owl Tricolored Blackbird Loggerhead Shrike Tehachapi Pocket Mouse American Badger Coast Horned Lizard	440
Pacific Wind Energy	Golden Eagle Burrowing Owl Northern Harrier White-Tailed Kite Peregrine Falcon Tricolored Blackbird Mountain Plover Yellow Warbler Loggerhead Shrike Tehachapi Pocket Mouse American Badger Coast Horned Lizard	8314
Alta Infill II	Golden Eagle Burrowing Owl Northern Harrier White-Tailed Kite Peregrine Falcon Tricolored Blackbird Mountain Plover Loggerhead Shrike American Badger Silvery Legless Lizard Coast Horned Lizard	840
Antelope Valley Solar I & II	Burrowing Owl Northern Harrier White-Tailed Kite Mountain Plover Loggerhead Shrike American Badger Silvery Legless Lizard Coast-Horned Lizard	6,180
RE Distributed Solar Projects (RE Rio Grande)	Golden Eagle Burrowing Owl Loggerhead Shrike	46

Catalina Renewable Energy Project	Golden Eagle Burrowing Owl Northern Harrier Peregrine Falcon Tricolored Blackbird Yellow Warbler Loggerhead Shrike American Badger Coast Horned Lizard	1578
RE Distributed Solar Projects (RE Rosamond One, RE Rosamond Two)	Golden Eagle Burrowing Owl American Badger	320
Rising Tree Wind Farm Project	Golden Eagle Burrowing Owl Northern Harrier Peregrine Falcon Mountain Plover Yellow Warbler Loggerhead Shrike Tehachapi Pocket Mouse American Badger Silvery Legless Lizard	289
RE Distributed Solar Projects (RE Columbia One, RE Columbia Two, and RE Columbia Three)	Burrowing Owl American Badger	400
Morgan Hills Wind Energy Project	Golden Eagle Burrowing Owl Northern Harrier White-Tailed Kite Peregrine Falcon Tricolored Blackbird Mountain Plover Yellow Warbler Grasshopper Sparrow Loggerhead Shrike Tehachapi Pocket Mouse American Badger Silvery Legless Lizard Coast Horned Lizard	729
Lower West Wind Energy Project	Golden Eagle Burrowing Owl Northern Harrier Loggerhead Shrike Coast Horned Lizard	14

Alta East Wind Project	Golden Eagle Burrowing Owl Northern Harrier Peregrine Falcon Loggerhead Shrike Tehachapi Pocket Mouse American Badger Silvery Legless Lizard Coast Horned Lizard	751
Palmdale Hybrid Power Plant (PHPP)	Golden Eagle Burrowing Owl Northern Harrier White-Tailed Kite Tricolored Blackbird Mountain Plover Loggerhead Shrike American Badger Silvery Legless Lizard Coast Horned Lizard Two-Striped Garter Snake San Emigdio Blue Butterfly	463
Rosamond Solar Project	Burrowing Owl Northern Harrier Loggerhead Shrike American Badger	1360
Willow Springs Solar Array Project	Golden Eagle Burrowing Owl Northern Harrier Loggerhead Shrike American Badger Silvery Legless Lizard Coast Horned Lizard	1402
Rosamond Solar Array Project	Golden Eagle Burrowing Owl Northern Harrier Yellow Warbler Loggerhead Shrike American Badger Coast Horned Lizard	80
RE Garland Solar Project	Golden Eagle Burrowing Owl Northern Harrier Tricolored Blackbird Mountain Plover	1640

RE Astoria Solar Project	Golden Eagle Burrowing Owl Northern Harrier Mountain Plover Loggerhead Shrike American Badger	2060
Kingbird Solar Photovoltaic Project	Burrowing Owl Tricolored Blackbird Mountain Plover Loggerhead Shrike American Badger	324
Centennial Specific Plan and Project	Golden Eagle Burrowing Owl Northern Harrier White-Tailed Kite Tricolored Blackbird Yellow Warbler Grasshopper Sparrow Loggerhead Shrike Tehachapi Pocket Mouse American Badger Silvery Legless Lizard Coast Horned Lizard Two-Striped Garter Snake San Emigdio Blue Butterfly Monarch Butterfly	8353
North Los Angeles/Kern County Regional Recycled Water Project	Golden Eagle Burrowing Owl Northern Harrier White-Tailed Kite Peregrine Falcon	N/A

Future development and planned transportation projects would result in permanent and temporary loss of habitat for plant and wildlife species in the area. Many of the projects listed in Table 134 have the potential to result in similar impacts that would cause losses to native vegetation communities that support special-status wildlife species. As shown in Table 134, the present and reasonably foreseeable projects within the cumulative impacts analysis area would also impact many of same listed and special-status wildlife species as the proposed project. As large scale energy projects and urbanization pressures increase within Kern County and Los Angeles County, impacts to biological resources within the region are expanding on a cumulative level.

Cumulative impacts for a project are concluded to be substantial if the incremental effects of the individual project are considerable when viewed in connection with the effects of past projects, other present projects, and probable future projects. The area that would potentially be disturbed by the proposed project is approximately 4,536 acres. While mitigation would reduce impacts to special-status wildlife species and their habitat, when taken collectively with past, present, and reasonably foreseeable actions, the proposed project would have a considerable contribution to the cumulative effects to biological resources. Based on the above discussion, the proposed project, in combination with the cumulative projects listed in Table 134, would result in an adverse cumulative impact to special-status wildlife and their habitat.

Avoidance, Minimization, and/or Mitigation Measures

Golden Eagle (*Aquila chrysaetos*)
BIO-29: Foraging individuals do occur within the BSA. Surveys for foraging individuals will be conducted prior to construction to identify sensitive foraging areas. These areas will be protected and appropriate buffers would be in place to protect individuals from construction related disturbances; such as impacts from dust and noise. Once individuals are confirmed to no longer be present, construction would resume within those protected areas, with a biological monitor present. Caltrans would implement a trash abatement program throughout the project's construction, per USFWS informal consultation for California condors, to reduce the likelihood of this species to land or forage within the project area.

BIO-30: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to golden eagle protection.

BIO-31: Direct impacts to the golden eagle are not expected to occur as a result of the proposed project. However, the proposed project will result in the direct loss of foraging habitat for raptor species. To reduce the impacts to foraging habitat, similar habitat within the region should be preserved in perpetuity. Caltrans will develop the appropriate level of off-site mitigation for this project through consultation with USFWS and CDFW, as well as restore disturbed habitat to preconstruction conditions with the use of native vegetation for landscaping. The HMMP that will be prepared for the project will cover agency coordination and approved compensatory mitigation plan for golden eagle foraging habitat.

Burrowing owl (*Athene cunicularia*)
Due to the migratory nature of this species, protocol level surveys will take place prior to the construction of this project to assess the exact location of active burrows and individuals. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures suggested in the CDFW 2012 Staff Report on Burrowing Owls. Within this report CDFW suggest the below listed avoidance and minimization measures, which Caltrans will utilize when appropriate and with the guidance of CDFW staff.

BIO-32: Preconstruction presence/absence surveys will be conducted prior to any ground disturbing activities within suitable habitat. Avoid disturbing occupied burrows during the nesting period of February 1 through August 31. Avoid impacts to burrows occupied by migratory individuals during the non-breeding season. Develop and implement a worker awareness program to increase the on-site recognition of and commitment to burrowing owl protection. Placement of visible markers near burrows to ensure that machinery does not collapse the burrows. Protect active burrows in place by setting up appropriate buffer zones (50m-500m) and visual screens during construction. Site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood of re-colonization of areas disturbed by the proposed project. The most recognized way to mitigate for impacts to nesting burrowing owls is to purchase suitable inhabited lands offsite and preserve it in perpetuity. Caltrans will develop the appropriate level of mitigation for this project through consultation with CDFW prior to construction, when the exact number of individuals with the potential to be impacted has been determined through protocol level surveys. Based on the 2012 CDFW Staff Report on Burrowing Owl Mitigation there are additional ways to mitigate for the impacts to burrowing owl, in addition to the purchasing of conservation lands. Restore disturbed habitat to preconstruction condition, including decompacting soil and the use of native vegetation for landscaping. Augmenting the project site with artificial burrows with the enhancement and maintenance of occupied areas. Enhancement and maintenance activities includes keeping lands grazed or mowed, as well as limiting and preventing human activity within the area. Acceptable mitigation for impacts to a burrowing owl breeding pair would be to preserve suitable habitat and manage it for the benefit of burrowing owl in perpetuity. CDFW guidelines suggest that such land should be of similar type and of equal or greater quality to ensure a no net loss. 2016 protocol level burrowing owl surveys were completed and will be used to coordinate with CDFW to calculate acreage amounts of suitable burrowing habitat to be preserved. This projects HMMP will include an agency approved mitigation plan for burrowing owls.

Special Status Paaserine Birds
Tricolored Blackbird (*Agelaius tricolor*), Yellow Warbler (*Setophaga petechial*), Grasshopper Sparrow (*Ammodramus savannarum),* Loggerhead Shrike (*Lanius ludovicianus*)
BIO-33: Preconstruction presence/absence surveys will be conducted prior to any ground disturbing activities within suitable habitat.

BIO-34: All riparian areas within Quail Lake are outside of the proposed construction zone and will be designated as an Environmentally Sensitive Area (ESA) and no work will be conducted within the areas to avoid potential impacts to potential tricolored blackbird habitat. The areas will be fenced off clearly by the use of obvious, orange ESA exclusion fencing along the California Department of Water Resources (DWR) chain-link fence prior to the onset of ground disturbance. An approved avian biologist will oversee the placement and design of this fencing.

BIO-35: Caltrans shall monitor construction activities during tricolored blackbird nesting season to monitor for potential noise impacts to nesting tricolored blackbirds.

BIO-36: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to tricolored blackbird protection.

BIO-37: Permanent impacts to tricolored blackbird foraging habitat shall be mitigated off-site at a minimum of a 2:1 ratio with consideration to the lands' proximity to Holiday Lake and Quail Lake as well as consideration to the lands within the San Andreas Rift Zone SEA and Antelope Valley IBA. Efforts shall be made to preserve foraging habitat with agricultural conservation easements. Off-site mitigation shall be preserved in perpetuity.

BIO-38: Temporary impacts to tricolored blackbird foraging habitat shall be mitigated onsite at a minimum of a 1:1 mitigation ratio within Caltrans ROW. Caltrans would restore disturbed habitat to preconstruction conditions with the use of native vegetation for landscaping using a Habitat Mitigation Monitoring Plan during PS&E.

BIO-39: Permanent impacts to tricolored blackbird nesting habitat at Quail Lake shall be mitigated for at Holiday Lake. Coordination shall occur with the Antelope Valley Audubon Society, West Valley County Water District, LA County Fire Department and the California Department of Fish and Wildlife to maintain water levels to support tricolored blackbird nesting habitat at Holiday Lake and to conduct controlled burns to refresh the riparian habitat.

BIO-40: A qualified biologist shall conduct a survey for breeding individuals, no sooner than two weeks prior to any construction activities, which have the potential to impact nesting birds.

BIO-41: If nesting individuals are found to be within the BSA prior to construction, the appropriate avoidance measures, such as buffer zones, would be established with guidance from CDFW.

BIO-42: A biological monitor shall be present for any clearing or grubbing related activities, which has the potential to impact foraging individuals of this species.

BIO-43: Direct impacts to yellow warbler habitat is expected to occur as a result of the proposed project. To reduce the impacts to foraging and breeding habitat, similar habitat within the region should be preserved in perpetuity, which will be done for multiple species found within the Quail Lake area of the BSA. Habitat preserved should consist of Fremont cottonwood forest (*Populus fremontii*), black willow thickets (*Salix gooddingii*), sandbar willow thickets (*Salix exigua*), mulefat thickets (*Baccharis salicifolia*), and Baltic and Mexican rush marshes (*Juncus articus var. balticus, mexicanus*) Caltrans will develop the appropriate level of off-site mitigation for this project through consultation with CDFW. Caltrans will restore disturbed habitat to preconstruction conditions with the use of native vegetation for landscaping.

BIO-44: Surveys for nesting grasshopper sparrows and loggerhead shrikes would be conducted by a qualified biologist no sooner than two weeks prior to construction. If nesting individuals are observed, a 150 ft buffer would be put in place under the guidance of CDFW. Should nesting occur within the proposed construction area, a biological monitor would be present during the nesting season for this species.

Raptors

Northern Harrier (*Circus cyancus*), White-Tailed Kite (*Elanus leucurus*), Peregrine Falcon (*Falco peregrinus*)

BIO-45:Pre-construction surveys for nesting raptors shall be conducted by a qualified biologist to ensure that no nests would be disturbed during project implementation. Multiple surveys should be conducted no more than 15 days prior to the initiation of construction activities. During this survey, the biologist should inspect all trees, tall structures, utility poles/towers within 500 feet of the proposed project area for raptor nests. Large ground nests in vegetation and grasses shall also be inspected for northern harrier nests. Subsequent verification surveys would be conducted by a qualified biologist no more than 3 days prior to construction work.

BIO-46:Pre-construction survey/sweep would be conducted immediately preceding construction work. If an active raptor nest is found within 500 ft. protective radius of the construction area to be disturbed by these activities, the biologist (in consultation with the CDFW and USFWS) shall determine the extent of a construction-free buffer zone to be established around the nest.

BIO-47: The nesting raptor survey areas will include all locations where construction is scheduled including a 500 foot survey buffer for construction staging and utility relocations. If utility relocation is anticipated and/or a helicopter will be used for work during the nesting raptor season, the nest surveys would include all areas of transmission poles/towers/lines and would include the helicopter work flight paths to the extent feasible.

BIO-48: If all necessary approvals have been obtained, potential nesting substrate (e.g., shrubs, trees, structures, and transmission poles/towers) that will be removed by the project should be removed before the onset of the raptor nesting season (January 1 through September 1), if practicable. This would help preclude nesting and substantially decrease the likelihood of direct impacts.

BIO-49: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to raptor protection.

BIO-50: Direct impacts to raptors are not expected to occur as a result of the proposed project. However, the proposed project would result in the direct loss of foraging habitat for raptor species. To reduce the impacts to foraging habitat, similar habitat within the region should be preserved in perpetuity. Caltrans will develop the appropriate level of off-site mitigation for this project through consultation with CDFW and restore disturbed habitat to preconstruction conditions with the use of native vegetation for landscaping.

Tehachapi Pocket Mouse (*Perognathus alticolus inexpectatus*)
Due to the elusive nature of this species, further trapping efforts will need to take place prior to the construction of this project to determine absence from the project site. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures in coordination with CDFW.

BIO-51: Conduct preconstruction presence/absence surveys to ensure the absence of sensitive rodent species.

BIO-52: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to sensitive rodent protection.

BIO-53: Placement of visible markers near active burrows to ensure that machinery does not collapse the burrows.

BIO-54: Protect active burrows in place by setting up appropriate buffer zones with ESA fencing.

BIO-55: Site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts.

American Badger (*Taxidea taxus*)
This species has a high potential to reside within the BSA, individuals were observed within the proposed project area. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures with the guidance of CDFW staff as to minimize the potential for any impacts.

BIO-56: Conduct preconstruction presence/absence surveys to ensure the absence of individuals.

BIO-57: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to American badger protection.

BIO-58: Placement of visible markers near active burrows to ensure that machinery does not collapse the burrows.

BIO-59: Protect active burrows in place by setting up appropriate buffer zones with ESA fencing.

BIO-60: Site specific monitoring will be conducted by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts.

Western Pond Turtle (*Emys marmorata*)

BIO-61: This species has the potential to reside within Quail Lake. Quail Lake would not be impacted by any of the project alternatives; as such impacts to the western pond turtle are not anticipated at this time. Caltrans would employ a qualified biologist to delineate the area around Quail Lake with environmentally sensitive area (ESA) fencing. .Caltrans will also use a qualified biologist to monitor all construction related activities performed adjacent to Quail Lake and ensure stormwater best management practices and SWPPP are implemented to minimize impacts to water quality.

Western Spadefoot Toad (*Spea hammondii*)

Western spadefoot toad has the potential to reside within the proposed project limits. Surveys performed for this species were performed during a drought year, which can be considered a limiting factor for positive species identification. Caltrans will utilize a qualified biologist to implement avoidance and minimization measures, with the guidance of CDFW staff.

BIO-62: Further studies for western spadefoot toad should be conducted, preferably during a year in which drought conditions are absent.

BIO-63: If western spadefoot toads are found to occur within the BSA, the areas with the potential for this species shall be clearly demarcated with the use of ESA fencing.

BIO-64: Construction shall not occur near areas with suitable western spadefoot habitat within 48 hours of a rain event.

BIO-65: Habitat temporarily impacted by the proposed project shall be restored to its original condition. Landscaping for the proposed project shall utilize native and non-invasive plant species.

BIO-66: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to western spadefoot toad protection.

BIO-67: Caltrans shall implement site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts.

Silvery Legless Lizard (*Anniella pulchara pulchara*)

This species has the potential to reside within the BSA. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures with the guidance of CDFW staff as to minimize the potential for any impacts. Compensatory mitigation for golden eagle and burrowing owl to be included in the project HMMP will serve as mitigation for this species.

BIO-68: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to silvery legless lizard and their protection.

BIO-69: Caltrans shall implement site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts, particularly during clearing and grubbing activities.

BIO-70: Habitat temporarily impacted by the proposed project shall be restored to its original condition. Landscaping for the proposed project shall utilize native plant species.

Coast Horned Lizard (*Pharynosoma blainvilii*)
This species has a high potential to reside within the BSA, with individuals being observed within the proposed project area. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures with the guidance of CDFW staff as to minimize the potential for any impacts. Compensatory mitigation for golden eagle and burrowing owl to be included in the project HMMP will serve as mitigation for this species.

BIO-71: Conduct preconstruction presence/absence surveys to ensure the absence of individuals.

BIO-72: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to coast horned lizard protection.

BIO-73: Site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts, with the relocation of individuals found within the project limits.

Two-Striped Garter Snake (*Thamnophis hammondii*)
This species has the potential to reside within the BSA, with individuals being observed within the vicinity of the proposed project area. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures with the guidance of CDFW staff as to minimize the potential for any impacts.

BIO-74: Conduct preconstruction presence/absence surveys to ensure the absence of individuals.

BIO-75: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to two-striped garter snake protection.

BIO-76: Site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts, with the relocation of individuals found within the project limits.

Coastal Whiptail (*Aspidoscelis tigris stejnegeri*)
This species has a low potential to reside within the BSA, with no individuals being observed within the proposed project area. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures with the guidance of CDFW staff as to minimize the potential for any impacts. Compensatory mitigation for golden eagle and burrowing owl to be included in the project HMMP will serve as mitigation for this species.

BIO-77: Conduct preconstruction presence/absence surveys to ensure the absence of individuals.

BIO-78: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to coastal whiptail protection.

BIO-79: Site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts, with the relocation of individuals found within the project limits.

Monarch Butterfly (*Danaus plexippus plexippus*)

BIO-80: Caltrans will employ a qualified biologist to identify, delineate, and preserve existing larval monarch habitat (milkweed, *Asclepias fascicularis*) with environmentally sensitive area (ESA) fencing. Where preservation of individual milkweed plants is not feasible, these individual plants shall be relocated to the nearest suitable area. A qualified biologist shall monitor these relocation efforts.

BIO-81: To make up for larval monarch habitat impacts, milkweed (*Asclepias fascicularis*) will be incorporated into a pollinator blend hydroseed mix for areas adjacent to impacted monarch habitat. These same areas and areas within rubber rabbitbush (*Ericameria nauseosa*) habitat will also receive placement of groupings of 9-10 one-gallon container plants of milkweed every tenth of a mile, which will be propagated from on-site materials 3 months in advance of placement. Plants and hydroseed would go in the first November/December after construction. Replacement numbers for one gallon container plants would be at least a ratio of 2:1 based on the number of individual milkweed plants impacted. Specifics related to revegetation performance measures and success criteria will be determined in a subsequent HMMP in coordination with resource agencies.

BIO-82: Milkweed will receive the same plant establishment as the other plant species. A three year monitoring period to assess plant survivorship and monarch use would be conducted by Caltrans or other partners, with a final report sent to U.S. Fish and Wildlife Service in support of the Presidential Policy on Pollinators. CDFW and the Xerces Society would also receive copies.

BIO-83: Develop and implement maintenance worker mowing practices to increase the on-site recognition of milkweed habitat and commitment to monarch habitat protection.

Desert Kitfox *(Vulpes macrotis arsipus)*
This species has the potential to reside within the BSA, with individuals being observed within the vicinity of the proposed project area. . Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures in coordination with CDFW and USFWS staff.

BIO-84: Conduct preconstruction presence/absence surveys to ensure the absence of sensitive rodent species.

BIO-85: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to sensitive rodent protection.

BIO-86: Placement of visible markers near active burrows to ensure that machinery does not collapse the burrows.

BIO-87: Protect active burrows in place by setting up appropriate buffer zones with ESA fencing.

BIO-88: Site specific monitoring by a qualified biologist throughout the project's construction to reduce the likelihood project related impacts. Desert kit fox habitat and natal dens will be assessed pre-construction.

3.3.5 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC), Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a No Effect finding. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct." California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both the FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special area

Affected Environment

Section 7 informal consultation with USFWS has occurred with Ray Bransfield regarding the following federal ESA listed species: the California condor, least Bell's vireo and southwestern willow flycatcher. With the implementation of the avoidance and minimization measures, the project is not likely to have adverse effects to the above federally listed species. USFWS has concurred with the finding of “not likely to adversely affect” for the following listed species: the California condor, least Bell’s vireo, and southwestern willow flycatcher. Designated critical habitat does not exist within the project limits for any listed species. Based on preliminary review, it is also presumed the proposed project would have no effect on the following federally listed species due to a lack of suitable habitat: arroyo toad, California red-legged frog, coastal California gnatcatcher, western snowy plover, desert tortoise, Riverside fairy shrimp, vernal pool fairy shrimp, California orcutt grass, San Fernando valley spineflower, and spreading navarretia. One federal and state listed endangered species, Bakersfield cactus (*Opuntia basilaris* var. *treleasei)*, had high potential of occurring, but none were observed during field surveys. A letter of concurrence was obtained from the USFWS on January 5, 2017. (see Appendix E)

Table 135: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Project Area.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale/Potential for Occurrence
Swainson's Hawk	*Buteo swainsoni*	ST	Grasslands with scattered trees, sage-juniper flats, riparian areas, savannahs and agricultural or ranch lands with groves or lines of trees.	P	Annual grasses are present within the proposed project area, as well as sage-juniper flats. Suitable breeding habitat does exist adjacent to the project area. The species was observed during focused raptor surveys.
California Condor	*Gymnogyps californianus*	FE, SE	Open rangeland, roosting in cliffs and large trees at 2000-6500 feet in elevation.	P	Foraging habitat present within the project area. Breeding habitat absent. The species was observed during focused raptor surveys.
Bald Eagle	*Haliaeetus leucocephalus*	S, SE	Requires large bodies of water, or free flowing rivers with abundant fish, and adjacent snags or other perches.	P	Foraging habitat present within the project area. Breeding habitat absent. Was incidentally observed during focused biological surveys.
Southwestern Willow Flycatcher	*Epidonax traillii extimus*	FE, SE	Dense shrubby riparian vegetation, dominated by willows	HP	Suitable habitat exists within the project area. The species has the potential to occur within the project area. Breeding pairs were not observed during focused surveys.
Least Bell's Vireo	*Vireo bellii pusillus*	FE, SE	Low Riparian in vicinity of water, Dry River Bottoms, below 2000 ft. in elevation	HP	Suitable habitat exists within the project area. The species has the potential to occur within the project area, however none were found during focused surveys.
California Gnatcatcher	*Polioptila californica californica*	FT,SSC	Coastal sage scrub below 2500 ft. in elevation, arid washes on mesa slopes	A	Suitable habitat does not exist within the project area, and none were identified during focused surveys, therefore a no-effect on species.
Western snowy plover	*Charadrius alexandrines nivosus*	FT	Beach, dry mud or salt flats, sandy shores of rivers, lakes, and ponds.	A	Suitable habitat does exist within or adjacent to the project area. The species is not expected to occur within the project area and therefore a no-effect on species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale/Potential for Occurrence
Mohave Ground Squirrel (MGS)	*Xerospermophilus mohavensis*	ST	Mojave region; open desert scrub, alkali desert scrub, and Joshua tree	A	Highly degraded habitat exists within the project area. No known occurrences within five miles of the project area. This species is not expected to occur and therefore no-effect on species.
Arroyo Toad	*Anaxyrus californicus*	FE, SSC	Wide terraced riparian floodplains, sandy river washes	A	Suitable habitat for this species does not occur within the project area and therefore a no-effect on species.
California Red-Legged Frog	*Rana draytonii*	FT	Shorelines with extensive vegetation, requires year round ponded water	A	Suitable habitat for this species does not occur within the project area and therefore no-effect on species.
Desert Tortoise	*Gopherus agassizii*	FT	Semiarid regions with friable soil and vegetative cover.	A	Low quality habitat exists within the project area. It was not observed during focused desert tortoise surveys. The species is not expected to occur within the project area and therefore no-effect on species.
Riverside Fairy Shrimp	*Streptocephalus woottoni*	FE	Ephemeral basins, clay bottom vernal pools	A	Suitable habitat for this species does not occur within the project area and therefore no-effect on species.
Vernal Pool Fairy Shrimp	*Branchinecta lynchi*	FT	Ephemeral basins, vernal pools	A	Suitable habitat for this species does not occur within the project area and therefore no-effect on species.
Delhi Sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	FE	Delhi sands formation, dunes located within San Bernardino and Riverside counties	A	No habitat was observed within the project area during field surveys. The species is not expected to occur and therefore no- effect on species.
El Segundo blue butterfly	*Euphilotes battoides allyni*	FE / CI	Coastal sand dunes including coast buckwheat in coastal Los Angeles County	A	No habitat was observed within the project area during field surveys. The species is not expected to occur and therefore no-effect on species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale/Potential for Occurrence
Quino checkerspot butterfly	*Euphydryas editha quino*	FE / CI	Patchy scrublands restricted to Riverside and San Diego counties	A	No habitat was observed within the project area during field surveys. The species is not expected to occur and therefore no-effect on species.
Palos Verdes blue butterfly	*Glaucopsyche lygdamus palosverdesensis*	FE /CI	Patches of locoweed or common deerweed among the Palos Verdes peninsula within LA County	A	No habitat was observed within the project area during field surveys. The species is not expected to occur and therefore no-effect on species.
California Orcutt Grass	*Orcuttia californica*	FE, CNPS List 1B.1	Vernal Pools	A	The plant species does not occur within the project area and the species was not observed during focused plant surveys; therefore, no-effect on species.
San Fernando Valley Spineflower	*Chorizanthe parryi var. fernandina*	USFWS Candidate CNPS List 1B.1	Sandy Soils; coastal scrub (sandy).	A	The plant species does not occur within the project area and the species was not observed during focused plant survey; therefore, no-effect on species.
Spreading Navarretia	*Navarretia fossalis*	FT, CNPS List 1B.1	Chenopod scrub, marshes and swamps (assorted shallow freshwater), playas or vernal pools.	A	The plant species does not occur within the project area and the species was not observed during focused plant surveys; therefore, no-effect on species.
Bakersfield cactus	*Opuntia basilaris var. treleasei*	FE, SE	Sandy soils of low hills, commonly in grassland areas; within the Bakersfield and in the Pacific Grassland, Mojave Desert, Turtle Mountains and San Bernardino County regions	HP	Suitable habitat for this species occurs within the BSA. Focused rare plant surveys took place for the proposed project in the spring of 2014 and 2015 during the known blooming periods of sensitive plant species. These surveys did not identify individuals occurring within the BSA. However, it should be noted that these surveys occurred within drought years, but because this species is long-lived, the species within the BSA is presumed not present; therefore no-effect on species.

Absent [A] - no habitat present and no further work needed. Habitat Present [HP] -habitat is, or may be present. The species may be present.

Present [P] - the species is present. Critically imperiled by Xerces society [CI]; Data Deficient for Xerces society [DD] Critical Habitat [CH] - project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present. Status: Federal Endangered (FE); Federal Threatened (FT); Federal Proposed (FP, FPE, FPT); Federal Candidate (FC), Federal Species of Concern (FSC);USFS Sensitive (S); State Endangered (SE); State Threatened (ST); Fully Protected (FP); State Rare (SR); State Species of Special Concern (SSC); **California Native Plant Society (CNP**

Information regarding threatened and endangered species was obtained from the Natural Environment Study. USFWS, the CDFW, and NOAA's National Marine Fisheries Service (NMFS) are the primary agencies responsible for coordination and review involving special-status species. The findings summarized in this section were based on extensive research and field surveys for special-status species in the biological study area and its vicinity. Prior to the surveys, record searches of the formal USFWS species list and the California Natural Diversity Database (CNDDB) were conducted. The species list is provided in Appendix E. The project is outside of the NMFS jurisdictional boundary.

Due to the lack of suitable habitat, the following species are not likely to occur within the project area, California orcutt grass, San Fernando Valley spineflower, spreading navarretia, vernal pool fairy shrimp, Riverside fairy shrimp, Mohave ground squirrel (MGS), desert tortoise, California red-legged frog, arroyo toad, California gnatcatcher, western snowy plover, the Delhi Sands flower-loving fly, El Segundo blue butterfly, Quino checkerspot butterfly, and the Palos Verdes blue butterfly. The project will have no effect on these listed species. These species are not addressed further in the document since they are presumed absent.

Environmental Consequences
Potential indirect effects to listed species that may occur within the project limits include:

- Increased light and glare
- Increased noise
- Vibration
- Increase in populations of non-native plants
- Increase in vehicle/wildlife collisions and kills
- Increase in human presence and development
- Habitat alteration
- Fugitive dust

Bakersfield cactus (*Opuntia basilaris var. treleasei*)
Through literature reviews of this species, it was found that several 2013 observations within 0.25 mi north of the BSA (near west end at the northern terminus) were recorded. Suitable habitat for this species occurs within the BSA. Focused rare plant surveys took place for the proposed project in the spring of 2014 and 2015 during the known blooming periods of sensitive plant species. These surveys did not identify individuals occurring within the BSA. Suitable habitat is present within the project corridor, but was not observed within the Preferred Alternative during the 2016 rare plants surveys. The Preferred Alternative will have no effect on Bakersfield cactus due its negative findings during the 2014, 2015, and 2016 rare plant surveys; therefore, no avoidance and minimization efforts or assessment of cumulative effects are necessary for this species. However, it should be noted that these surveys occurred within drought years, but because this species is long-lived, the species within the BSA is presumed not present.

Bald Eagle (*Haliaeetus leucocephalus*)
Suitable foraging habitat does occur within the western portion of the proposed project area, near Quail Lake and the California Aqueduct. Raptor surveys were conducted throughout 2015, including during known breeding periods. Bald eagles were not observed within the BSA during focused raptor surveys. However, this species was incidentally observed during the Wildlife Movement Study (Appendix J) conducted for the proposed project. For more detail of these occurrences, please refer to the Raptor Survey Reports, Natural Environment Study (NES) Appendix K (Caltrans, 2016).

Although there is a low potential for bald eagle occurrences within the BSA, avoidance and minimization measures will be implemented to minimize potential impacts to this species. The species is not known to nest within the BSA, and direct impacts to the bald eagle are not expected to occur.

Swainson's Hawk (*Buteo swainsoni*)
Suitable Swainson's hawk habitat was found to occur throughout the proposed project area. Raptor surveys were conducted by Caltrans biologists throughout 2015, including during known breeding periods. Multiple breeding pairs of Swainson's hawk were observed within three miles of the project limits. For more detail of these occurrences, please refer to the Raptor Survey Reports, Appendix K of the NES (Caltrans, 2016).

The proposed project has the potential to have permanent impacts to suitable Swainson's hawk foraging habitat, with roughly 3,768.30 acres of the BSA containing suitable foraging habitat for raptors. Foraging habitat within the BSA consist of allscale (*Atriplex polycarpa*) scrub, fourwing saltbush (*Atriplex canescens)* scrub, big sagebrush (*Artemisia tridentata*), Mojave mixed woody scrub, California buckwheat (*Eriogonum fasciculatum*) scrub, rubber rabbitbrush (*Ericameria nauseaosa*) scrub, fallow agriculture, cheatgrass (*Bromus tectorum*) grassland, disturbed, and active agriculture. The proposed clearing and removal limits would not destroy or modify designated critical habitat for any Swainson's hawk. Due to the degraded nature of the habitat near the roadway, Swainson's hawks are not anticipated to be nesting within the grading limits of the proposed project. Avoidance and minimization measures would be implemented to minimize potential impacts to this species. Direct impacts to Swainson's hawk are not expected to occur.

California Condor (*Gymnogyps californianus*)
Suitable foraging habitat does occur within the western portion of the proposed project area. Raptor surveys were conducted throughout 2015, including during known breeding periods. California condors were observed flying over the western portion of the BSA. For more detail of these occurrences, please refer to the Raptor Survey Reports, Appendix K of the NES (Caltrans, 2016).

The proposed project has the potential to have permanent impacts to suitable California condor foraging habitat, with roughly 3,768.30 acres of the BSA containing suitable foraging habitat. Foraging habitat within the BSA consist of allscale (*Atriplex polycarpa*) scrub, fourwing saltbush (*Atriplex canescens)* scrub, big sagebrush (*Artemisia tridentata*), Mojave mixed woody scrub, California buckwheat (*Eriogonum fasciculatum*) scrub, rubber rabbitbrush (*Ericameria nauseaosa*) scrub, fallow agriculture, cheatgrass (*Bromus tectorum*) grassland, disturbed, and active agriculture. The proposed clearing and removal limits would not destroy or modify designated critical habitat for California condor. Due to the specific nesting requirements of the California condor it is highly unlikely that they would be found nesting within or adjacent to the proposed project area. Avoidance and minimization measures would be implemented to minimize potential impacts to this species. Direct impacts to California condor are not expected to occur. Informal consultation was conducted with USFWS regarding the California condor and USFWS concurred with the finding of not likely to adversely affect.

Southwestern Willow Flycatcher (*Epidonax traillii extimus*)
Surveys for the southwestern willow flycatcher followed the protocol outlined by Sogge *et al.* (2010). Qualified biologists performed five surveys during three survey periods; with two surveys occurring within each of the last two survey periods. The three survey periods for 2014 protocol level surveys were: Period 1- May 15 to 31, Period 2- June 1 to 24, and Period 3- June 25 to July 17. Transects were spaced 100 feet apart within potentially suitable habitat, occurring within the western end of the BSA.

Southwestern flycatcher vocalizations were played and followed by a period of at least one minute of listening, and positive detections were recorded using portable GPS units. Twelve willow flycatcher detections were recorded during periods one and two, and consisted of ten adult willow flycatchers that sang the diagnostic “fitz-bew” song in response to the audio recording. No adult willow flycatchers were detected during period three of the protocol level surveys. For more detail of these occurrences, please refer to the 2014 Southwestern Willow Flycatcher and Least Bell’s Vireo Survey Report, Appendix L of the NES.

The presence of breeding southwestern willow flycatchers is determined by direct observance of nesting behavior or by willow flycatcher detection during period three of protocol level surveys (June 25-July 17). No evidence of breeding southwestern willow flycatchers was detected during the 2014 protocol level surveys.

The 2016 Southwestern Willow Flycatcher surveys recorded 10 migrant willow flycatcher detections during survey periods 1 and 2 within the action area. Willow flycatchers were not detected within the site during survey period 3 and evidence of breeding willow flycatchers was not observed.

Southwestern willow flycatcher foraging and breeding habitat within the BSA consists of Fremont cottonwood forest (*Populus fremontii*), black willow thickets (*Salix gooddingii*), sandbar willow thickets (*Salix exigua*), mulefat thickets (*Baccharis salicifolia*), and Baltic and Mexican rush marshes (*Juncus articus var. balticus, mexicanus*). The proposed clearing and removal limits would not destroy or modify designated critical habitat for southwestern willow flycatcher. Due to the results of the 2014 protocol level surveys it is unlikely that they would be found nesting within the proposed project area. Although there is a low potential for nesting southwestern willow flycatchers within the BSA, avoidance and minimization measures would be implemented to minimize potential impacts to this species. Direct impacts to southwestern willow flycatcher are not expected to occur.

The proposed project has the potential to permanently impact approximately 3.84 acres (1.55 ha) and to temporarily impact approximately 0.59 acres (0.24 ha) of suitable LBVI and SWWF habitat along the western portion of the Preferred Alternative as a result of construction activities. At this time, it is assumed that willow flycatchers migrate through the project area and use the area for foraging purposes only and do not nest within the BSA. Although there is a low potential for nesting southwestern willow flycatchers within the BSA, avoidance and minimization measures will be implemented to minimize potential impacts to this species. Direct impacts southwestern willow flycatcher are not expected to occur. Informal consultation was conducted with USFWS regarding southwestern willow flycatcher and USFWS concurred with the finding of not likely to adversely affect.

Least Bell's Vireo (*Vireo bellii pusillus*)
Qualified biologists conducted surveys for least Bell's vireo following USFWS protocol (USFWS 2001). These surveys were conducted concurrently with protocol level surveys conducted for southwestern willow flycatcher (*Epidonax traillii extimus*). These surveys took place during three periods, during the spring/summer of 2014. The three survey periods were Period 1: May 15 to 31, Period 2: June 1 to 24, and Period 3: June 25 to July 17.

No evidence of breeding or foraging least Bell's vireo was detected during the 2014 and 2016 protocol level surveys. At this time, it is assumed at this time that this species does not utilize the project area for breeding or foraging. However, suitable habitat is present. Please refer to Appendix L of the NES for further details.

The proposed project has the potential to have permanent impacts to suitable least Bell's vireo foraging and breeding habitat. Foraging habitat within the BSA consist of Fremont cottonwood forest (*Populus fremontii*), black willow thickets (*Salix gooddingii*), sandbar willow thickets (*Salix exigua*), mulefat thickets (*Baccharis salicifolia*), and Baltic and Mexican rush marshes (*Juncus articus var. balticus, mexicanus*). The proposed clearing and removal limits would not destroy or modify designated critical habitat for least Bell's vireo. Due to the results of the 2014 and 2016 protocol level surveys it is unlikely that they would be found within the proposed project area. Permanent impacts will occur to approximately 3.84 acres (1.55 ha) and temporary impacts will occur to approximately 0.59 acres (0.24 ha) of suitable LBVI habitat along the western portion of the Preferred Alternative as a result of construction activities. Riparian habitat within the Preferred Alternative is marginal in most areas, with much of the understory vegetation struggling or dead from an apparent lack of water. Although there is a low potential for least Bell's vireo occurrences within the BSA, avoidance and minimization measures will be implemented to minimize potential impacts to this species. Direct impacts least Bell's vireo are not expected to occur and USFWS concurs that the project may affect, but is not likely to adversely affect, the least Bell's vireo.

Cumulative Impacts

Health and Historical Context
The project corridor is situated on the north side of the San Gabriel Mountains, largely within the Antelope Valley that comprises the western Mojave Desert, and south of the Tehachapi Mountains. The majority of the eastern portion of the project corridor largely comprises vegetation communities characteristic of the Mojave Desert, whereas the western one-third of the project corridor represents a transition zone between desert, foothill and montane environments. This portion of the project corridor contains a high level of species diversity due to the convergence of these three geographic regions.

The Antelope Valley Region is characterized by creosote bush and saltbush plant communities which make up approximately 75 percent of the natural lands in the Western Mojave Desert. A small percentage of natural lands in the area can be characterized as Mojave mixed woody scrub community. A very small percentage of the Antelope Valley Region could be characterized as freshwater or alkali wetlands (Bureau of Land Management [BLM] 2005).

The region is generally flat and sparsely vegetated, but is interspersed with buttes, mountain ranges, and dry lakes (BLM 2005).). The Fairmont and Antelope buttes represent a unique habitat due to their location, as the most westerly buttes of the Mojave Desert and their close proximity to several geographic regions. The Fairmont and Antelope buttes provide vital habitat to many wide ranging species, which forage in outlying habitat, but use the buttes for nesting, roosting, denning, and refuge. The buttes also serve as concentrated wintering grounds for birds of prey, which are rare in the County, and which forage on grassland and agricultural fields in the vicinity. The combination of these resources, as well as the confluence of many community types, support an unusually high diversity of bird species. Not unlike other taxonomic groups, small and large mammal populations within the proposed SEA are diverse and reflective of the unique confluence of several habitat type.

The Antelope Valley has a wide range of raptors that depend on the valley for breeding and foraging habitat. High quality raptor foraging and nesting habitat in the region is abundant. The project limits consist of open and disturbed areas which are considered suitable habitat for common raptor species and special-status raptor species. The project limits have high levels of disturbance due to the existing highway, fallow agricultural activity and new solar farms. The adjacent open space creates a potential for nesting and foraging for raptors.

The CNDDB literature review identified 12 vegetation communities within the project area that are considered special status habitats or sensitive natural communities: canyon live oak ravine forest, coastal and valley freshwater marsh, southern coast live oak riparian forest, southern cottonwood willow riparian forest, southern mixed riparian forest, southern riparian forest, southern riparian scrub, southern sycamore alder riparian forest, southern willow scrub, valley needlegrass grassland, valley oak woodland, and wildflower field. The proposed project area also includes vegetation communities that are regionally recognized as having great habitat value. These communities include Joshua tree woodland and California juniper woodland.

Approximately one-third of the Bakersfield cactus historical population has been extirpated. Once likely more or less continuous east of Bakersfield, the current range of Bakersfield cactus consists of scattered fragments of these once larger population. Agricultural land conversion, oil development, sand mining, urbanization, off-road vehicle use, flood control basins, telecommunication and electrical lines construction, and possibly wildfires were considered threats to Bakersfield cactus habitat at the time of its listing in 1990. Currently the loss and modification of habitat from agricultural conversion, wind energy development, and urban, especially residential, development remain the largest threats to Bakersfield cactus. Threats today also include oil development, off-road vehicle use, sand mining, and competition from non-native grasses. In addition, climate change, air pollution (including elevated nitrogen deposition), loss of pollinators, flooding and loss of genetic diversity have been identified as potential new threats.

The proposed project has the potential to have permanent impacts to suitable foraging and breeding habitat for various sensitive species including: Swainson's hawk, California condor, southwestern willow flycatcher, least Bell's vireo. Table 136 lists the past, present, and reasonably foreseeable actions that would also potentially result in habitat loss to these species.

<u>Reasonably Foreseeable Actions and Their Impacts</u>

The proposed clearing and removal limits of the proposed project would not destroy or modify designated critical habitat. Also, it is unlikely that California condor, southwestern willow flycatchers and least bell's vireo would be found nesting within the proposed project area. Although there is a low potential for occurrences of these species within the BSA, avoidance and minimization measures would be implemented to minimize potential impacts to these species. Avoidance and minimization measures would also be implemented to minimize potential impacts to nesting birds; as such, impacts to nesting birds are not expected to occur.

However, the proposed project would result in the direct loss of foraging habitat for raptor species (Swainson's hawk and California condor). Also, the proposed project would result in the direct loss of foraging and potential breeding habitat for southwestern willow flycatcher, yellow warbler, as well as potential breeding habitat for least bell's vireo. Caltrans would develop the appropriate level of off-site mitigation for this project through consultation with CDFW & USFWS and restore disturbed habitat to pre-construction conditions with the use of native vegetation for landscaping.

With proposed avoidance and minimization measures, as well as the purchase of mitigation parcels, impacts to individuals of sensitive species is expected to be low. Also, when added to all other approved projects within the region the impact to individuals is expected to remain low.

Table 136: Reasonably Foreseeable Actions – Sensitive Animal Species

Project	Potential Impact Area	Sensitive Species
California High Speed Train System	154 – 238 ac.	12-14
High Desert Corridor Project	9,037 ac.	7
West Antelope Solar	178.5 ac.	6
Pacific Wind Energy	226 ac.	14
AV Solar Ranch One	1,937 ac.	9
Alta-Oak Creek Mojave	Similar to Alta Infill II	Similar to Alta Infill II
Alta Infill II	840 ac.	13
Antelope Valley Solar I & II	2,152 ac.	9
RE Rio Grande	46 ac.	1
Catalina Renewable Energy Project	335.5 ac.	5
RE Rosamond One and RE Rosamond Two	320 ac.	1
Rising Tree Wind Farm	106 ac.	17
RE Columbia One, RE Columbia Two, and RE Columbia Three	400 ac.	2
Morgan Hills Wind Energy	729 ac.	18
Lower West Wind Energy	14 ac.	9
Palmdale Hybrid Power Plant	434 ac.	8
Willow Springs Solar Array	1,402 ac.	11
Rosamond Solar Array	80 ac.	13
RE Garland Solar Project	2,057 ac.	8

RE Astoria Solar Project	2,060 ac.	6
Kingbird Solar Photovoltaic Project	324 ac.	5
Centennial Specific Plan and Project	6,700 ac.	18
Soledad Mountain Project	905 ac.	4
North Los Angeles/Kern County Regional Recycled Water Project	Not Available	10
Antelope Valley Public Landfill	185 ac.	6
2014 Tehachapi Sanitary Landfill Revision Project	239.76	2

Avoidance, Minimization, and/or Mitigation Measures

Swainson's Hawk (*Buteo swainsoni*)
Breeding raptors are known to abandon active nests due to disturbances cause by construction activities. Caltrans would employ the use of qualified biologists to implement avoidance and minimization measures with the guidance of CDFW staff.

BIO-89: Pre-construction surveys for nesting Swainson's hawk shall be conducted by a qualified biologist to ensure that no nests would be disturbed during project implementation. Multiple surveys should be conducted no more than 15 days prior to the initiation of construction activities. During this survey, the biologist should inspect all trees, tall structures, utility poles/towers within five miles of the proposed project area for Swainson's hawk nests. Subsequent verification surveys would be conducted by a qualified biologist no more than 3 days prior to construction work.

BIO-90: Pre-construction survey/sweep would be conducted immediately preceding construction work. If an active raptor nest is found within the 500-foot protective radius of the construction area to be disturbed by construction activities, the biologist shall consult with CDFW and USFWS to determine additional avoidance measures.

BIO-91: The nesting Swainson's hawk survey areas would include all locations where construction is scheduled including survey buffers for construction staging and utility relocations. If utility relocation is anticipated and/or a helicopter would be used for work during the nesting raptor season, the nest surveys would include all areas of transmission poles/towers/lines and will include the helicopter work flight paths to the extent feasible.

BIO-92: If all necessary approvals have been obtained, potential nesting substrate (e.g., ground vegetation, shrubs, trees, structures, and transmission poles/towers) that will be removed by the project shall be removed before the onset of the raptor nesting season (January 1 through September 1). This would help preclude nesting and substantially decrease the likelihood of direct impacts.

BIO-93: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to Swainson's hawk protection. Prior to the initiation of construction activities, all project personnel will be educated regarding the species, their habitat within and adjacent to the project area and will be provided with an information handout with photos of Swainson's hawk, species description, avoidance, minimization measures, Caltrans biologist contact information and the environmental commitments.

BIO-94: Permanent impacts to Swainson's hawk foraging habitat shall be mitigated off-site at a 2:1 ratio with consideration to the lands' proximity to Holiday Lake and Quail Lake as well as consideration to the lands within the San Andreas Rift Zone SEA, Joshua Tree Woodland SEA and Antelope Valley IBA. Efforts shall be made to preserve foraging habitat with agricultural conservation easements. Off-site mitigation shall be preserved in perpetuity.

California Condor (*Gymnogyps californianus*)

BIO-95: As California condors are a scavenger species, Caltrans would implement a trash abatement program throughout the project's construction, to reduce the likelihood of this species to land or forage within the project area. This would include the use of a qualified biologist to monitor all construction related activities for compliance.

BIO-96: The implementation of a 24-hour roadkill removal protocol shall be implemented during the operational phase of the Preferred Alternative.

BIO-97: Develop and implement a worker awareness program to increase the on-site recognition of and commitment to California condor protection. Prior to the initiation of construction activities, all project personnel will be educated regarding California condor within and adjacent to the project area and will be provided with an information handout with photos of California condor, species description, avoidance, minimization measures, Caltrans biologist contact information and the environmental commitments.

Southwestern Willow Flycatcher (*Epidonax traillii extimus*) and Least Bell's Vireo (*Vireo bellii pusillus*)

BIO-98: All riparian areas within Quail Lake are outside of the proposed construction zone will be designated as an Environmentally Sensitive Area (ESA) and no work will be conducted within the areas to avoid potential impacts to potential Southwestern Willow Flycatcher (SWWF) and least Bell's vireo (LBVI) habitat. The areas will be fenced off clearly by the use of obvious, orange ESA exclusion fencing along the California Department of Water Resources (DWR) chain-link fence prior to the onset of ground disturbance. An approved avian biologist will oversee the placement and design of this fencing.

BIO-99: All other riparian areas will have an approved avian biologist monitoring all clearing and grubbing activities and will designate approved work areas and demarcate ESA with obvious, orange ESA exclusion fencing to avoid impacts to potential SWWF and/or LBVI habitat. This measure applies to work activities in or around riparian vegetation within the Preferred Alternative.

BIO-100: Pre-construction protocol level SWWF and LBVI surveys shall be conducted. If nesting individuals are found to be within the BSA, the appropriate avoidance measures, such as buffer zones, will be established with guidance from USFWS and CDFW.

BIO-101: Standard BMPs will be implemented by Caltrans to protect ecologically important resources in the construction zone. General stormwater BMPs and conservation measures would be implemented during project construction to avoid any potential for downstream sedimentation effects on all riparian habitat. The BMPs of the storm water pollution prevention plan (SWPPP) will be designed to avoid potential indirect effects to all riparian habitat.

BIO-102: Caltrans will develop and implement a worker awareness program to increase the on-site recognition of and commitment to southwestern willow flycatcher and least Bell's vireo protection. Prior to the initiation of construction activities, all project personnel will be educated regarding SWWF and LBVI, their habitat within and adjacent to the project area and will be provided with an information handout with photos of SWWF and LBVI, species description, avoidance, minimization measures, Caltrans biologist contact information and the environmental commitments. Construction personnel are to remain outside of riparian habitat, unless within the approved work area.

3.3.6 Invasive Species

Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive plants that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

Affected Environment

The project has the potential to spread invasive species to adjacent native habitats in the BSA by the entering and exiting of construction equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and by the improper removal and disposal of invasive species so that seed is spread along the highway. Please see NES section 5.5.

Environmental Consequences

None of the species on the California list of invasive species are used by the Department for erosion control or landscaping in NW SR-138 Project. All equipment and materials would be inspected for the presence of invasive species.

Avoidance, Minimization, and/or Mitigation Measures

BIO-103: In compliance with EO 13112 (see Section 3.3.6), a weed abatement program will be developed to minimize the importation of nonnative plant material during and after construction to avoid impacts to riparian vegetation downstream. Eradication strategies would be employed should an invasion occur. During construction, the construction contractor shall inspect and clean construction equipment accordingly with non-potable water at the beginning and end of each day and prior to transporting equipment from one project location to another. During construction, soil and vegetation disturbance would be minimized to the greatest extent feasible. During construction, the contractor shall ensure that all active portions of the construction site are watered with non-potable water a minimum of twice daily or more often when needed due to dry or windy conditions to prevent excessive amounts of dust. All material stockpiled would be sufficiently watered with non-potable water or covered to prevent excessive amounts of dust. During construction, soil/gravel/rock would be obtained from weed-free sources. Only certified weed-free straw, mulch, and/or fiber rolls would be used for erosion control. After construction, affected areas adjacent to native vegetation will be revegetated with plant species approved by the District Biologist that are native to the vicinity. The native seed mix will include native vegetation and native flowers known to occur within the area. After construction, all revegetated areas will avoid the use of species listed on Cal-IPC's California Invasive Plant Inventory. Erosion control and revegetation sites will be monitored for 2 to 3 years after construction to detect and control the introduction/invasion of nonnative species. Eradication procedures (e.g., spraying and/or hand weeding) will be outlined should an infestation occur; the use of herbicides would be prohibited within and adjacent to native vegetation, except as specifically authorized and monitored by the District Biologist and Landscape Architect.

3.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

No Build Alternative

The No Build Alternative would not have construction impacts or use local resources, nor would it enhance long-term productivity. This alternative would not provide long term benefits to the communities along the NW SR-138 corridor. Non-standard roadway features would not be brought to standard and improved mobility would not occur. Operations on local roadways would worsen as the region's population grows.

Build Alternatives

Implementation of the NW SR-138 Build Alternatives would result in attainment of long-term transportation objectives as identified in federal, state, and local/regional planning documents dating as described in Section 3.1.1.2, *Consistency with State, Regional, and Local Plans and Programs*. The proposed project would provide a substantial long-term benefit to the region by improving west-east mobility and addressing present and future travel demand needs. Other long-term benefits of the proposed project are listed in Section 1.2, Project Purpose. As an improved transportation facility, the NW SR-138 Corridor Improvement Project is an integral component of long-range planning for the northern region of Los Angeles. The Build Alternatives would have similar impacts and are discussed separately only if an impact would not apply to both Build Alternatives. These impacts would vary in degree for each alternative, but they are generally similar.

The following **local short-term impacts** are expected from the project:

- **Displacement of Households and Businesses**. Relocation of these uses would be required, resulting in temporary disruption of residents, neighborhoods, and businesses.

- **Construction Traffic Impacts**. Construction impacts related to travel lane closures and traffic detours would result in temporary inconveniences and lost productivity due to delays.

- **Construction Air Quality and Noise Impacts**. Properties in the vicinity of construction activities would be exposed to air and noise emissions and increased noise levels.

- **Temporary Natural Habitat Displacement**. Construction activities would displace natural habitat that is used by common and sensitive species; long-term adverse effects are not expected.

- **Increased Energy Usage during Construction**. An increased use of energy would occur during the operation of construction equipment and manufacture/fabrication of construction materials.

Compliance with standard conditions and implementation of minimization and mitigation measures would help to reduce these impacts. These measures include the phased acquisition of property, development of a Traffic Management Plan (TMP), and compliance with regulations designed to reduce construction-related impacts. Though the impacts would be considered short term when compared to the long-term productivity of the project, the duration of construction may be viewed as a prolonged inconvenience to the residents and businesses in the immediate area of construction.

Short-term benefits would also result from the project. These benefits would include an increase in jobs and revenue in the local economy generated during construction activities.

The following **long-term impacts** are expected from the project:
• **Displacement of Households, Businesses, and Public Facilities**. Both build alternatives would result in the displacement of homes, businesses, and/or public facilities. Adequate replacement stock for residential and business units within the area has been identified. However, there could be substantial relocation problems for displacees as a result of overcrowded residences, higher rents, competition from cash offers by investors, and the potential of displaced homeowners not qualifying for home loans as a result of foreclosures. Therefore, Caltrans may require a longer timeline to vacate properties, and Last Resort Housing Program payments may be required to relocate residential households being displaced.

• **Long-Term Loss of Habitat for Sensitive Species**. The project would potentially disturb about 4,495 acres of natural communities which could be used as habitat of various animal species.

• **Change in Visual Character**. Either of the Build Alternatives would widen a transportation corridor for approximately 36 miles in a relatively rural desert region.

• **Potential Impacts to Historical and Paleontological Resources**. Previously unidentified cultural materials and/or paleontological resources could be unearthed and destroyed during construction activities.
• **Increased Noise**. Even with abatement, noise levels next to the roadway in some areas would be elevated with introduction of a new transportation facility.

• **Permanent Consumption of Construction Materials**. An irrevocable use of materials would be used during construction, including concrete, steel, and asphalt.

The project would provide long-term benefits in the northern LA County Desert region and beyond.

The following **long-term benefits** are expected from the project:

• **Improvement to Traffic Circulation**. The project would improve non-standard roadway features and increase mobility for an approximately 36-mile long segment of NW SR-138. These transportation improvements would enhance safety within the SR-138 corridor and accommodate foreseeable increases in travel and goods movement within northern Los Angeles County. As a result, this would benefit the community and support the circulation demands of future development in the project vicinity.

• **Improvement to Interregional Goods Movement**. Together, routes I-5, SR-14, and SR-138 provide a link to other state routes and interstate roadways that are used by trucks transporting goods beyond the local area; therefore, providing an improved route would allow more efficient goods movement in and beyond the immediate NW SR-138 Corridor vicinity.

3.5 CONSTRUCTION IMPACTS

This section summarizes the potential construction-related impacts considered for the Build Alternatives. Some construction-related impacts are considered temporary impacts for some resources, such as the use of temporary construction easements (TCEs) on parcels of land, but for some resources, construction-related impacts can be a permanent impact on a resource, such as Paleontological resources. These impacts are discussed in detail in the corresponding sections in Chapter 3. The environmental impacts described below for the Build Alternatives would not occur under the No Build Alternative because the No Build Alternative does not include construction of any of the improvements in the Build Alternatives.

The majority of the work under the Build Alternatives would occur in the mainline of the existing SR138 which requires shifting of traffic to one side for construction. A minimum of two lanes will remain open during the construction period. It is assumed that construction along I-5 will be completed in conjunction with the work along SR-138. Information regarding the phasing of build alternatives is preliminary and dependent on need and funding availability. Construction of either of the build alternatives is estimated to take approximately 3 to 4 years (36 to 48 months) if the project were to be constructed entirely at one time. Should funding not be available to construct the project at one time, a phasing plan would be developed based upon need and availability of funds.

Information regarding the phasing of build alternatives is preliminary and dependent on need and funding availability. Construction of either of the build alternatives is estimated to take approximately 3 to 4 years (36 to 48 months) if the project were to be constructed entirely at one time. Should funding not be available to construct the project at one time, a phasing plan would be developed based upon need and availability of funds. Due to the length (approximately 36 miles) of the project, and due to the need for funding support to be identified, construction of the project may need to be phased, with a construction sequence developed for logically defined segments within the corridor. Implementation of TSM features that would be compatible with future improvements could work as a first phase of work for either of the Build Alternatives.

Incremental Features

Safety and operational improvements consistent with the elements identified in the TSM Alternative, which has been rejected for further consideration, could be elements included in the early implementation phase of this alternative. Specific improvements would include enhanced channelization at intersections with higher rates of traffic accidents, shoulder widening, and curve corrections on the eastern end of Quail Lake near the Quail Lake Sky Park. For the purpose of air quality analysis and other technical studies, the opening year for the initial phase of the project is assumed to be 2020 and the opening year for the ultimate improvements included for both Alternatives 1 and 2 is assumed to be 2025, subject to funding availability. Additional considerations for project implementation and project phasing would be included in the *Strategic Implementation and Funding Plan*.

3.5.1 Land Use

Construction of the Build Alternatives is expected to last approximately three to four years. Typical roadway construction activities would result in some temporary, localized impacts to land uses in the area, including additional truck traffic, pollutant emissions from construction activities, increased noise and vibration, temporary delays and/or detours. However, such potential construction impacts would be temporary and intermittent, and would not result in changes in existing land uses or General Plan land use designations in this area.

Both build alternatives would require Temporary Construction Easements (TCEs) to provide access to construct the improvements. TCEs would not affect existing or designated land uses, except for temporary loss of parking spaces, storage space and field road access.

Typical roadway construction activities would result in some temporary, localized impacts such as additional truck traffic, pollutant emissions from construction activities, and increased noise and vibration. Potential construction impacts would be temporary and intermittent, and would not be considered adverse.

3.5.2 Farmland

Temporary air quality and noise impacts may result from project construction activities such as structure demolition, grading, pavement grinding and paving operations, us of heavy-duty construction equipment, and fugitive dust emissions. Since these activities are intermittent and temporary, there would be no substantial adverse impacts to farmland associated with the project during construction. Construction staging would not occur on agricultural land outside the project footprint. Farm equipment and worker access to the farmland would not be impacted.

3.5.3 Utilities/Emergency Services

During construction of the Build Alternatives, some impairment to the delivery of emergency services, including fire and police response times, may occur as a result of lane restrictions, ramp closures, road closures, and/or detours. The proposed improvements could result in traffic delays to travelers and emergency service providers when traveling in and around construction areas and to/from emergency scenes when lane restrictions, ramp closures, road closures, and/or detours are in effect. Also, refer to the discussion in Section 3.5.4 below regarding potential effects to local circulation.

Measure UT-3 from Section 3.1.5 (Utilities/Emergency Services), and measure TRAF-3 from Section 3.1.6 (Transportation and Traffic/Pedestrian and Bicycle Facilities) address short-term transportation impacts during construction of the Build Alternatives, including potential delays for emergency service providers. Measure UT-3 requires coordination with emergency service providers, and measure TRAF-3 outlines the elements of the Transportation Management Plan (TMP) prepared for the proposed project. The TMP would be implemented during project construction.

It is anticipated that underground utilities within the proposed ROW may require removal or abandonment during construction activities, which may result in temporary service disruptions to some utility users in the vicinity of such activities. Measure UT-1 from Section 3.1.5 addresses coordination with affected private and public service utilities. This process would include evaluation of ways to avoid utility relocations by refining the project design and/or protecting existing utilities in place.

3.5.4 Traffic

Construction of the proposed improvements will be staged to minimize impacts to traffic on SR-138, I-5 and SR-14. On SR-138, a significant portion of the proposed facility does not overlap the existing alignment which allows for the preservation and use of the existing facility during construction. Under these conditions the entire width of the proposed facility can be constructed adjacent to the existing facility without any significant traffic interruptions. Those sections of the proposed facility that overlap the existing highway can be staged to allow construction of either the westbound or eastbound pavement while keeping traffic on the existing facility. Construction staging would require one lane of traffic in each direction open to the public at all times. The anticipated construction staging would allow construction of new lanes adjacent to the existing lanes (either north or south of the existing roadway), and allow traffic to continue to use the existing lanes.

Stage 1 involves constructing two temporary transition roadways in the median of the freeway section west of Gorman Post Road to allow for shifting of all traffic lanes to either the westbound or eastbound pavement to accommodate the future traffic shifts. Stage 2 involves constructing the future eastbound pavement or the full facility while traffic remains on the existing highway. Stage 3 involves constructing the remainder of the proposed facility while traffic is shifted to the newly constructed pavements.

Additional temporary detours are needed at several locations along the corridor where the proposed facility intersects the existing to avoid full closure of the highway. On I-5, the proposed widening is outside the shoulder area of the existing freeway and therefore temporary railing would need to be placed near the existing edge of travel way. On SR-14, the proposed replacement of the SR-138/SR-14 Separation Structure would need to be constructed in two stages to maintain at least two lanes of traffic on SR-138. Temporary rerouting of bicycle traffic may be required during the second stage of construction. In addition, the proposed modifications to each ramp would be staged to avoid long term ramp closures. Construction of the remaining bridges and ramps can be accomplished in a single stage.

Existing bike routes generally use local roadways that parallel the south side of existing SR-138. There are three existing crossings at 110th, 90th, and 60th Street West that carry the existing bicycle routes to the Kern County line. At Old Ridge Road, 3 Points Road, and 245th Street West the bike route transitions onto existing SR-138. During construction it is anticipated that very minor detouring may be necessary to continuously provide the same level of access and mobility within the corridor. Potential impacts may result during construction where the bicycle trails converge at the intersection of SR-138 and Ridge Route Road.   However, impacts would depend on construction schedules for each new trail and would be expected to be minimal. It is anticipated that additional temporary signage will be used in order to accommodate this effort.

3.5.5 Cultural Resources

The potential for construction impacts to identified cultural resources is discussed in section 3.1.8 (Cultural Resources). Measures CUL-1 through CUL-3, as discussed in 3.1.8 (Cultural Resources), would be implemented to avoid and/or minimize adverse effects to Archaeological Sites SR-049, SRAS-003, and P19-003723.

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC), which would then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains would contact the Caltrans District 7 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

3.5.6 Water Quality and Stormwater Runoff

During construction of the alternatives, there is potential for construction-related pollutants to be spilled, leaked, or transported into storm water runoff, which could enter into drainages adjacent to the project area, and could eventually reach downstream receiving waters. Chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported in storm water runoff into receiving waters.

The project would also require the disturbance of 2,347 acres under Alternative 1, 2,307 acres under the Alternative 1 (Antelope Acres Bypass), and 1,889 acres under Alternative 2. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. In addition, during a storm event, soil erosion could result at an accelerated rate.

The alternatives would be required to comply with the Construction General Permit (CGP). Under the CGP, the project is required to perform a risk assessment to determine the project risk level. The project risk level is determined from the sediment risk and the receiving water risk. The receiving water risk is classified as high because a portion of the disturbed area discharges indirectly to Pyramid Lake, which is a 303(d)-listed waterbody impaired by sediment. The project is classified as Risk Level 2 because of the combined medium sediment risk level and the high receiving water risk. There are three risk levels: 1, 2, and 3, with Risk Level 3 being the highest environmental risk. All risk levels are subject to temporary construction site BMP implementation and visual monitoring requirements. Risk Level 2 projects require storm water sampling at all discharge locations, with the samples subject to Numeric Action Levels for pH and turbidity. The required BMP implementation and sampling would minimize impacts to receiving water bodies.

In accordance with the CGP, a SWPPP would also be required prior to construction because the Disturbed Soil Area (DSA) would be more than one acre for Alternative 1, Alternative 1 with Antelope Acres Bypass, and Alternative 2. The SWPPP would include the development of a Construction Site Monitoring Program that would present procedures and methods related to the visual monitoring and sampling and analysis plans for non-visible pollutants, sediment, turbidity, pH, and receiving waters.

Because the project is classified as a Risk Level 2, a Rain Event Action Plan (REAP) is also required in accordance with the CGP. The REAP would be developed by a Qualified SWPPP Practitioner (QSP) at least 48 hours prior to any likely precipitation event. Other requirements for Risk Level 2 projects are presented in Attachment D of the CGP.

In compliance with Caltrans Statewide NPDES Permit Order No. 2012-0011 DWQ, NPDES No. CAS000003, a notice of intent (NOI) would be filed with the Los Angeles and Lahontan RWQCBs at least 30 days before the start of construction. The project would also comply with the County's Phase I MS4 Permit.

The project would include the protection of existing vegetation for erosion and sediment control. Existing vegetation in the project area primarily consists of species adapted to the arid desert environment. Between approximately 220th Street West and 170th Street West, large groves of Joshua

Trees are located on both sides of the existing SR-138. Existing vegetation to remain in place would be protected in temporary Environmentally Sensitive Areas (ESA) that would be fenced during construction. It is not expected that ground water would be encountered during construction, and ground water dewatering would not be required for the project.

The project would not result in the loss of aquatic habitat, and would not result in changes to waterways that would be expected to affect fish or local wildlife passage in the project area. No substantial or adverse changes in the physical, chemical, or biological characteristics of the aquatic environment are expected to result from project construction. Because the construction BMPs would be designed to retain sediment and other pollutants in the project area so they would not reach receiving waters, storm water discharges and authorized non-storm water discharges are not anticipated to cause or contribute to any violations of applicable water quality standards or objectives, or adversely impact human health or the environment. In addition, because construction BMPs would be designed to retain sediment and other pollutants in the project area so they would not reach receiving waters, runoff during construction would not contain pollutants in quantities that would create a condition of nuisance or adversely affect beneficial uses of any water bodies. Therefore, water quality impacts during construction of the build alternatives would not be adverse.

3.5.7 Geology/Soils/Seismic/Topography

The Build Alternatives would require ground disturbance to implement the proposed improvements, and exposed soils could result in soil erosion during construction of the build alternatives. In addition, a large amount of cuts and excavations would be required during construction, although the majority of the cuts and excavations would be relatively minor (about five feet). During construction, the cut slopes could become unstable, resulting in surficial instability and landslides. With the implementation of avoidance, minimization, and mitigation measures described below, these impacts would be substantially minimized. In addition, potential impacts would be temporary, and exposed soils and cut slopes would be stabilized after construction is complete. Therefore, the build alternatives would not result in substantial short-term construction impacts related to geology, soils, seismicity, and topography.

3.5.8 Paleontology

The Build Alternatives would create surface or subsurface impacts that may adversely impact potential paleontological resources. Vertical impacts of construction are at present unknown as the designs have yet to be completed, however are expected to be as much as 58 feet deep for structure foundations. Even shallow excavations in areas mapped as Pleistocene alluvial deposits, the Ridge Route Formation, the Hungry Valley Formation, and the Santa Margarita Formation have the potential to encounter paleontological resources and should be monitored full-time. Due to the depth, excavations also have the potential to impact fossils in the Holocene alluvial deposits present throughout most of the site. Measures PALEO-1 through PALEO-3, as outlined in Section 3.2.4 (Paleontology), would be implemented during construction of the Build Alternatives where there is potential for encountering paleontological resources during construction.

3.5.9 Hazardous Waste/Materials

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Aerially Deposited Lead is likely present along the existing highway shoulders and therefore represents a potential Recognized Environmental Condition (REC) to the Study Area. Lead-based paint should be anticipated in lane striping paint (most commonly in yellow striping paint) along the current SR-138 alignment. In addition, if acquisition of additional ROW includes demolition of older structures (buildings or roadways/bridges), LBP should be anticipated on painted surfaces. As with all structures regardless of age, Asbestos Containing Materials (ACMs) should be anticipated. It is anticipated that underground utilities within the proposed ROW may require removal or abandonment during construction activities. It should be noted that underground utilities may consist of, or be coated or wrapped with asbestos containing materials that were historically used for insulation purposes or to prevent corrosion of buried utility lines. In addition, the concrete irrigation diverters observed along the ROW may also be suspect to contain ACMs. Soil disturbance and the demolition of existing structures could release hazardous materials such as lead and ACMs during construction, as described in Section 3.2.5 (Hazardous Waste/Materials).

The features on properties observed outside of the Alternatives' ROWs do not represent environmental conditions to the proposed construction activities within the proposed Alternatives' ROWs. A sewage treatment facility is located east of the proposed Alternatives' ROWs at the intersection of SR-138 with SR-14. This facility includes several evaporation/sewage treatment ponds. Due to the distance of these facilities and structures from the proposed Alternatives' ROWs, and the expected direction of groundwater flow to the northeast, away from proposed construction activities, it is unlikely that environmental releases or impairments resulting from activities on these facilities/properties would have a significant impact to the construction in the proposed ROW Alternatives.

Other than minor amounts of scattered and windblown litter along SR-138 and intersecting roadways, no other solid waste was noted within the limits of the Study Area, aside from the debris observed located on private properties. The debris would need to be disposed of at an appropriate facility. No other solid waste disposal issues were noted within the proposed ROW.

Based on a field reconnaissance of the proposed ROW and on historical research (aerial photographs and topographic maps) numerous properties appeared to have historically been used for agricultural production of crops or orchards. Current agricultural activities were observed further north and south of the existing SR-138 ROW. As a result, potential historical pesticide use is considered a REC for both of the Build Alternatives between approximately 290th Street West to the SR-138/SR14 interchange.

Measures HAZ-1 through HAZ-5, as outlined in Section 3.2.5 (Hazardous Waste/Materials) would be implemented during construction of the Build Alternatives where there is potential for encountering hazardous waste/materials and use/disposal of hazardous materials during construction.

3.5.10 Air Quality Construction

During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are anticipated and would include CO, NO_X, VOCs, directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. Construction-related effects on air quality from most roadway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, CO, SO_2, NO_X, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after drying. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, the silt content of soil, wind speed, and the amount of equipment operating at the time. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.
SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 ppm of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust would be minimal.

The maximum amount of construction-related emissions during a peak construction day is presented in Table 137**.** The PM10 and PM2.5 emissions assume a 50 percent control of fugitive dust as a result of watering and associated dust-control measures. The emissions presented below are based on the best information available at the time of calculations and specify that the schedule for Alternative 1 and 2 is anticipated to take approximately 53 months, beginning in April 2022 and ending in August 2026.

Table 137: Maximum Project Construction Emissions Alternatives 1 and 2

Project Phases	**ROG**	**CO**	**NO_X**	**Total PM_{10}**	**Total $PM_{2.5}$**
Grubbing/Land Clearing (lbs/day)	15.8	113.8	96.3	104.2	24.5
Grading/Excavation (lbs/day)	23.1	179.0	169.3	108.2	27.5
Drainage/Utilities/Sub-Grade (lbs/day)	16.6	144.0	115.2	104.5	24.7
Paving (lbs/day)	4.8	42.8	32.3	1.1	1.0
Maximum (lbs/day)	23.1	179.0	169.3	108.2	27.5
Total (tons/construction project)	**10.1**	**81.5**	**71.4**	**52.7**	**13.0**

Source: LSA Associates, Inc. (August 2015).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gases

Compliance with Caltrans Standard Specifications Sections 10, 18, and 7-1.01F and the South Coast Air Quality Management District (SCAQMD) and Antelope Valley Air Quality Management District (AVAQMD) Rules and Regulations during construction would reduce construction-related air quality impacts from fugitive dust emissions and construction equipment emissions. See Section 3.2.6 (Air Quality) Avoidance, Minimization, and/or Mitigation Measures that would be implemented during construction activities.

The scope and description of the proposed project have been updated in the upcoming RTP and FTIP. Regional conformity for the proposed project will be demonstrated once the upcoming RTP and FTIP are approved by FHWA/FTA.

Construction Conformity

The schedule for all improvements is anticipated to take approximately 53 months, beginning in April 2022 and ending in August 2026. Therefore, construction activities would not last for more than five years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

Mobile Source Air Toxics (MSATs)

Emissions factors for each of the MSATs were obtained for the project area using emission rates generated by EMFAC2014 and the VMT associated with each of the project alternatives. Results of the analyses are tabulated in for the existing (2012), 2020, 2025, and 2040 conditions. Alternatives 1 and 2 have early implementation safety and operational improvements.

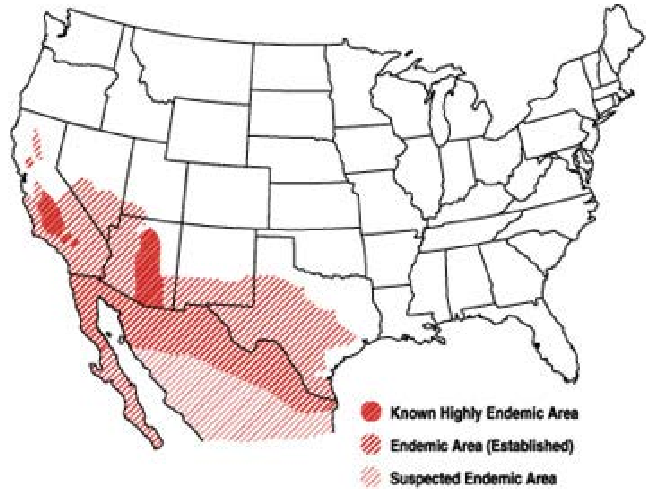
The analysis indicates that a substantial decrease in MSAT emissions can be expected between the existing (2012) and future (2020, 2025, and 2040) under No Build Alternative conditions. This decrease is prevalent throughout the highest priority MSATs and the analyzed alternatives. This decrease is also consistent with the aforementioned EPA study that projects a substantial reduction in on-highway emissions of benzene, formaldehyde, 1, 3-butadiene, and acetaldehyde between 2000 and 2050. Based on the analysis for this project, between the 2012 Existing and 2040 No Build Alternative conditions, reductions in MSAT expected are: 87 percent of diesel PM, 65 percent of benzene, 66 percent of 1,3 butadiene, 31 percent of naphthalene, 46 percent of POM, 67 percent of acrolein, and 59 percent of formaldehyde. These projected reductions are achieved while total VMT in the project area increase by 51 percent.

Valley Fever

The Centers for Disease Control and Prevention (CDC) indicates that *Coccidioides immitis* is a fungus found in the soil of dry, low rainfall areas and is native and common in many areas of the southwestern United States, Mexico, and Central and South America. As shown below, the project is in an endemic area for *Coccidioides*. Coccidioidomycosis, also known as Valley Fever, is a common cause of pneumonia in the areas where *Coccidioides* occurs. *Coccidioides* spores circulate in the air after contaminated soil and dust are disturbed by such human or natural activities as winds, construction, farming, animal burrows, or burial. The spores are typically inhaled, although in rare cases spores can enter the skin through cuts or abrasions and cause infection. After the fungal spores are settled in the lungs, they change into a multicellular structure called a spherule. Fungal growth in the lungs occurs as the spherule grows and bursts, releasing endospores, which then develop into more spherules.

At least 30 to 60 percent of people who live in endemic areas such as the Antelope Valley region where the fungus is present are exposed to the fungus at some point during their lives. In most people, the infection will go away on its own, but for a small segment of the population, including people of Asian descent (particularly those of Filipino descent), African-American, pregnant women, and people with weakened immune systems; the risk for the disease is increased. It is difficult to avoid exposure to *Coccidioides*, but people who are at higher risk should try to avoid breathing in large amounts of dust if they are in endemic areas.

Endemic regions of *Coccidioides immitis* in the United States and northern Mexico



Source: USGS, 2000

Most people who are exposed to the fungus do not develop symptoms or have mild flu-like symptoms that go away on their own. In severe cases, patients develop pneumonia or meningitis which can sometimes lead to death. Meningitis, the most lethal complication of disseminated Valley Fever, may cause a stiff neck, severe and persistent headache, nausea, vomiting, and various other central nervous system symptoms such as disorientation, loss of balance or equilibrium, inability to think clearly, and loss of consciousness. In addition to humans, Valley Fever affects many species of domestic and wild animals. Because the spores of *Coccidioides immitis* can become airborne during soil disturbance, dust suppression is an important aspect of managing its spread.

Valley fever is not contagious, and therefore, cannot be passed on from person to person. Most of those who are infected will recover without treatment within six months and will have a life-long immunity to the fungal spores. In severe cases, such as patients with rapid and extensive primary illnesses, those who are at risk for dissemination of disease, and those who have disseminated disease, anti-fungal drug therapy is used. Only one to two percent of those exposed who seek medical attention will develop a disease that disseminates to other parts of the body than the lungs.

There are measures that can be implemented to lower the incidence of infection and also reduce the numbers of spores inhaled, thereby decreasing the chances of developing a more serious form of the disease. These measures include dust control and prevention, use of dust masks with appropriate filters, use of construction equipment with enclosed, air-conditioned cabs, and/or positioning of construction workers upwind when possible. Furthermore, infection risk can also be lowered by conducting outdoor activities, such as field studies or construction activities, in the winter months; avoiding sites favorable for *Coccidioidesimmitis* growth; seeking prompt medical treatment if flu-like or respiratory illness occurs during or within a few weeks following fieldwork or construction activities; getting a coccidioidin skin test to determine susceptibility to the disease; or by educating all members of the field party and construction crew about the possibilities and consequences of infection.

Construction of the proposed project would occur in an endemic area where *Coccidioides immitis* naturally occurs. Temporary soil disturbance during construction grading activities could cause fungal spores (if present) to become airborne, potentially putting construction personnel, residents, and wildlife at risk of contracting Valley Fever. However, as noted above, most Valley Fever cases are very mild, and more than half of infected people either have no symptoms or experience flu-like symptoms and never seek medical attention. There are a number of preventive and precautionary measures that can be undertaken to reduce exposure and which include the use of dust masks when conducting outdoor activities, such as field studies or performing construction activities in the winter months; seeking prompt medical treatment if flu-like or respiratory illness occurs during or within a few weeks following fieldwork or construction activities; getting a coccidioidin skin test to determine susceptibility to the disease; and educating all members of the field party and construction crew about the possibilities and consequences of infection. Dust control measures are the main defense against infection, although all persons residing or traveling through the High Desert would be susceptible to the disease, regardless of whether or not the project is implemented.

Compliance with measures listed under Avoidance, Minimization, and/or Mitigation Measures – Air Quality would control dust during project construction. As a result, this measure would reduce the potential for contact with *Coccidioides immitis* spores and, as such, the potential for health impacts during construction of the project associated with Valley Fever would be minimized. Also, adherence to the Occupational Safety and Health Administration (OSHA) rules (including Injury and Illness Prevention, Control of Harmful Exposures, Respiratory Protection) would adequately provide for the protection of the project's workforce from Valley Fever.

3.5.11 Noise

23 CFR 772 requires that construction noise impacts be identified, but does not specify specific methods or abatement criteria for evaluating construction noise. However, the FHWA Roadway Construction Noise Model (Federal Highway Administration 2006) can be used to determine if construction would result in adverse construction noise impacts on land uses or activities in the project area.
During the construction phases of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by Caltrans standard specifications, Section 7-1.01I, Sound Control Requirements. These requirements state that noise levels generated during construction shall comply with applicable local, state, and federal regulations. Figure 71 typical noise levels produced by construction equipment commonly used on roadway construction projects. As indicated, equipment involved in construction is expected to generate noise levels ranging from 70 to 90 dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6 dBA per doubling of distance. Normally, construction noise levels should not exceed 86 dBA (Lmax) at a distance of 50 feet. No adverse noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans standard specifications and would be short-term, intermittent, and dominated by local traffic noise.

Implementing the following measures would minimize temporary construction noise impacts:

1. Equipment Noise Control should be applied to revising old equipment and designing new equipment to meet specified noise levels.

2. In-Use Noise Control where existing equipment is not permitted to produce noise level in excess of specified limits.

3. Site Restrictions is an attempt to achieve noise reduction through modifying the time, place, or method of operation of a particular source.

4. Personal Training of operators and supervisors is needed to become more aware of the construction site noise problems.

1. Equipment noise control is needed to reduce the noise emissions from construction sites by mandating a specified noise levels for design of new equipment, and updating old equipment with new noise control devices and techniques presented below:

   - Mufflers are very effective devices which reduce the noise emanating from the intake or exhaust of an engine, compressor, or pump. The fitting of effective mufflers on all new equipment and retrofitting of mufflers on existing equipment is necessary to yield an immediate noise reduction at all types of road construction sites.
   - Sealed and lubricated tracks for crawler mounted equipment will lessen the sound radiated from the track assembly resulting from metal to soil and metal to metal contact. Contractors, site engineers, and inspectors should ensure that the tracks are kept in excellent condition by periodic maintenance and lubrication.
   - Lowering exhaust pipe exit height closer to the ground can result in an off-site noise reduction. Barriers are more effective in attenuating noise when the noise source is closer to ground level.
   - General noise control technology can have substantially quieter construction equipment when manufacturers apply state-of-the-art technology to new equipment or repair old equipment to maintain original equipment noise levels.

2. In–use site noise control is necessary to prevent existing equipment from producing noise levels in excess of specified limits. Any equipment that produces noise levels less than the specified limits would not be affected. However, those exceeding the limit would be required to meet compliance by repair, retrofit, or replacement. New equipment with the latest noise sensitive components and noise control devices are generally quieter than older equipment, if properly maintained and inspected regularly. They should be repaired or replaced if necessary to maintain the in-use noise limit. All equipment applying the in-use noise limit would achieve an immediate noise reduction if properly enforced.

3. Site restrictions should be applied to achieve noise reduction through different methods, resulting in an immediate reduction of noise emitted to the community without requiring any modification to the source noise emissions. The methods include shielding with barriers for equipment and site, truck rerouting and traffic control, time scheduling, and equipment relocation. The effectiveness of each method depends on the type of construction involved and the site characteristics.

   - Shielding with barriers should be implemented at an early stage of a project to reduce construction equipment noise. The placement of barriers must be carefully considered to reduce limitation of site access. Barriers may be natural or manmade, such as excess land fill used as a temporary berm strategically placed to act as a barrier.

- Efficient rerouting of trucks and control of traffic activity on construction site will reduce noise due to vehicle idling, gear shifting and accelerating under load. Planning proper traffic control will result in efficient workflow and reduce noise levels. In addition, rerouting trucks does not reduce noise levels but transfers noise to other areas that are less sensitive to noise.

- Time scheduling of activities should be implemented to minimize noise impact on exposed areas. Local activity patterns and surrounding land uses must be considered in establishing site curfews. However, limiting working hours can decrease productivity. Sequencing the use of equipment with relatively low noise levels versus equipment with relatively high noise levels during noise sensitive periods is an effective noise control measure.

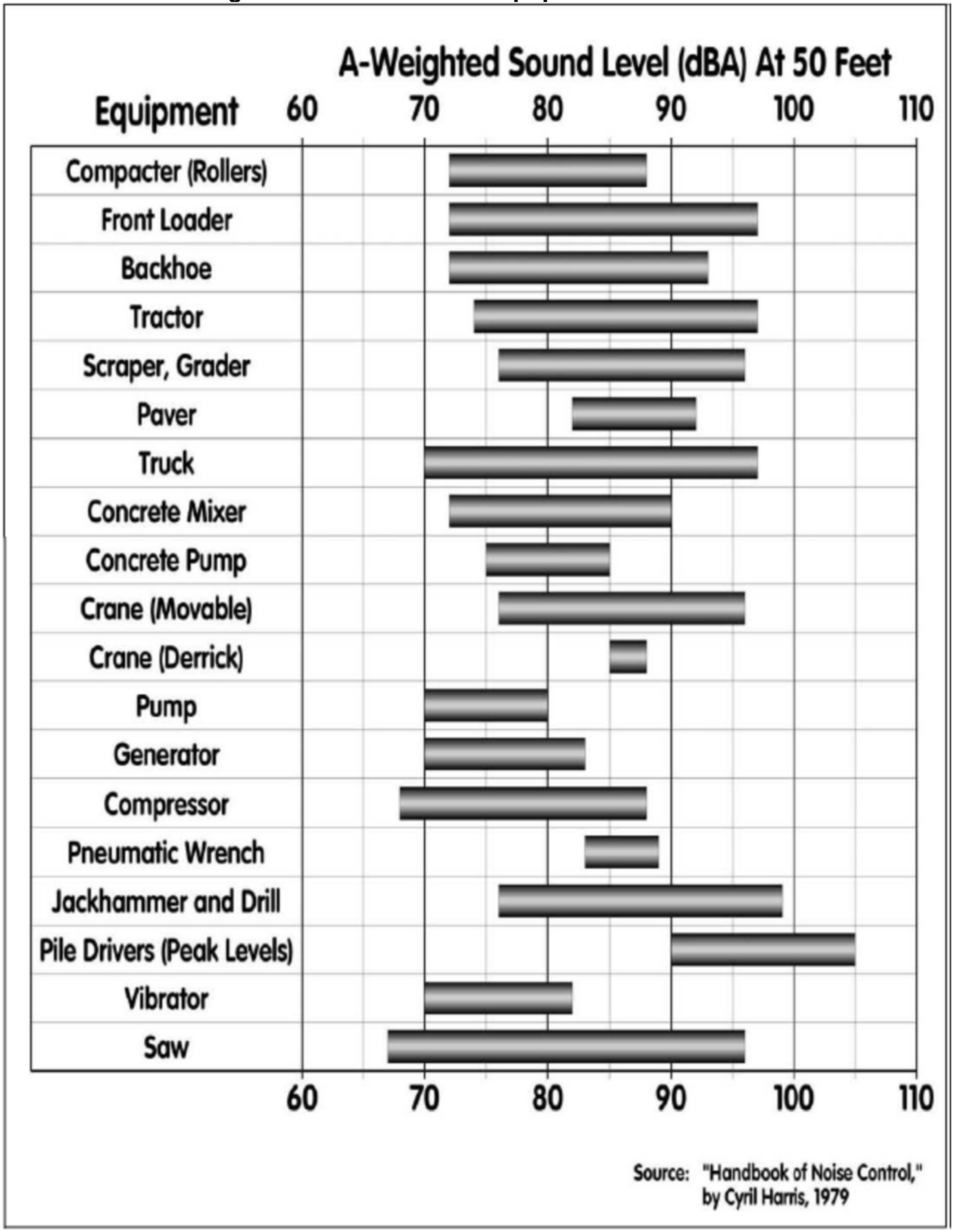
- Equipment location should be as far from noise sensitive land use areas as possible. The contractor should substitute quieter equipment or use quieter construction processes at or near noise sensitive areas.

4. Educating contractors and their employees to be sensitive to noise impact problems and noise control methods. This may be one of the most cost-effective ways to help operators and supervisors become more aware of the construction site noise problem and to implement the various methods of improving the conditions. A training program for equipment operators is recommended to instruct them in methods of operating their equipment to minimize environmental noise. Many training programs are presently given on the subject of job safety. This can be extended to include the impact due to noise and methods of abatement.

3.5.12 Hydrology

The proposed improvements cross the California Aqueduct system at two locations. The first location is near Quail Lake, a regulated storage body for the West Branch of the California Aqueduct, which passes under SR-138 in two reinforced concrete box culverts. The second location is near 245th Street West where SR-138 passes over the California Aqueduct on a single span bridge. The aqueduct is contained in an open, concrete-lined channel, at both locations. Along the alignment of the proposed improvements the valley drains to the northeast and east. No major streams are present in the project area; however numerous unnamed drainages descend from the mountains along southerly margin of the valley and pass under SR-138. Most of these drainages do not experience flow except during heavy rainfall and are not confined to manmade channels. The source of flows in the ephemeral, intermittently flowing streams is storm water runoff and sheet flow from nearby hillsides. These flows can be concentrated in canyons and washes to create short-term flood impacts. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. In addition, during a storm event, soil erosion could result at an accelerated rate. Alternative 1 has the largest impact footprint among all three build alternatives and therefore it is anticipated to have the greatest impacts to the existing drainage system. The recommended mitigation measures to mitigate the impacts to the existing drainage system include Storm Water Treatment Best Management Practices (BMP), a Storm Water Data Report (SWDR), and Storm Water Management Plan (SWMP). The recommended mitigation measures for Alternative 1 to mitigate the impacts to the existing drainage system, i.e. BMPs, SWDR, SWMP, would also be used for Alternative 2.

Figure 71 Construction Equipment Noise Levels



3.5.13 Biological Resources

As discussed in Section 3.3 Biological Environment, the Build Alternative would result in temporary impact to biological resources.

Construction work would involve the use of heavy equipment to clear vegetation and grade the project site. These activities would displace natural habitat that is used by common and sensitive species. The alkali mariposa lily was found to be the most prevalent sensitive plant species within the BSA. The second most prevalent sensitive plant species found within the BSA was the round-leaved filaree. The proposed project has the potential to spread invasive species to adjacent native habitats in the Biological Study Area (BSA) by the entering and exiting of construction equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and by the improper removal and disposal of invasive species so that seed is spread along the highway. Temporary construction staging areas and access roads would be strategically placed to avoid and/or minimize impacts to jurisdictional features to the extent feasible and areas are expected to be enhanced to pre-project conditions.

The proposed project has the potential to directly or indirectly impact wildlife movement throughout the project limits. Project construction activities would create noise, dust, and vibration that could adversely affect animals within and next to the construction site. This disturbance could cause animals to move away from construction. Habitat next to the construction site may not be used by species sensitive to construction noise, dust, and vibration effects. Night lighting during construction of the project could spill over into the adjacent open space and could adversely affect foraging activities of nocturnal species (e.g. burrowing owl, bats, and other small mammals) and may also increase predation of small mammals; therefore, the project's night lighting may affect nocturnal wildlife. If construction limits are not clearly marked, construction operators could inadvertently remove habitat that should not be removed. Because the project includes numerous sensitive habitat areas, this effect could be potentially substantial. Compliance with the minimization and mitigation measures presented in Section 3.3, Biological Environment, would reduce construction impacts.

3.5.14 Cumulative

If multiple projects are built during the same general time frame, it would likely result in increased localized construction-related traffic congestion. An increase in localized construction-related traffic construction would contribute to short-term cumulative effects to emergency services in delayed response times. Construction-related traffic congestion would be minimized by implementation of a Traffic Management Plan (TMP) that would contain detailed plans of access routes and detours during construction.

Short-term impacts associated with construction debris could potentially be adverse when considered with the waste disposal needs of the other cumulative projects in the area. Recycling of material either onsite or offsite would minimize the impacts of the build alternatives.

The proposed project, in combination with all other cumulative projects in the watershed areas, would involve construction activities that could result in the erosion of soil, thereby cumulatively degrading water quality. However, all projects in the Resource Study Area are required to comply with existing regulations regarding construction practices that minimize risks of erosion and runoff. Compliance with applicable regulatory requirements identified in Section 3.2.2, Water Quality and Stormwater Runoff, which require implementation of BMPs during construction phases, would ensure that water quality is maintained to the maximum extent practicable for potential development projects within the watershed areas.

Reasonably foreseeable actions include construction activities that could potentially increase the hazardous materials in the RSA from construction activities associated with the North Los Angeles/Kern County Regional Recycle Water Project. Impacts as a result of the California High Speed Train System were determined to be less than significant through design refinement at the project level as well as the use of best practices to avoid potential impacts during construction. For the proposed project, project-specific impacts related to hazardous waste/materials would be avoided, minimized and mitigated through conformance with applicable regulatory requirements and implementation of the measures discussed below.

Standard BMPs would be incorporated into the project to comply with the Caltrans and County's NPDES Permits. Similar requirements would be required of other of cumulative projects within the RSA. Also, all other cumulative projects propose avoidance, minimization and/or mitigation measures that would reduce impacts related to hazardous waste/materials. The proposed project and cumulative projects could indirectly affect adjacent habitat during construction. To avoid or offset potential cumulative effects on biological resources, individual projects would implement avoidance, minimization, and/or mitigation measures. These measures include, but are not limited to, preconstruction biological surveys, biological monitoring, BMPs, construction contract standard provisions, contract nonstandard provisions, environmental awareness training, and habitat compensation to mitigate for potential effects to federally and State-listed species.

3.5.15 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

As discussed in the Cumulative Impacts section under each resource, the impacts of the build alternatives would be similar to each other, and construction would require the commitment of natural, physical, human, and fiscal resources. The loss of developed and undeveloped properties and use of the land that would be acquired for the project would be an irreversible and long-term commitment of this resource.

Construction would also require use of fossil fuels, water, and construction materials such as concrete cement, aggregate (i.e., sand and gravel), asphalt, steel, paint, fencing, pipes, and other materials that are generally not retrievable once they have been used to build a road.

Labor would be needed to produce construction materials, demolish existing structures and infrastructure, and build the new NW SR-138 facility; however, as a beneficial impact, the project would provide employment for local labor resources and would not adversely affect the availability of labor resources in the affected communities.

Construction of the project would require a substantial one-time expenditure of local, State, and federal funds, which are not retrievable; however, commitment of these resources would benefit residents, workers, travelers, businesses, and others throughout the area, region, and State from the improved quality of the transportation system. Improvements to local and regional mobility and accessibility are expected to outweigh the irreversible and irretrievable commitment of resources

CHAPTER 4 | CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

4.1 DETERMINING SIGNIFICANCE UNDER CEQA

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

An example of the differences between NEPA and CEQA can be illustrated by comparing the project noise impact analysis. When determining whether a noise impact is significant under CEQA, compare the baseline noise level and the build noise level. The CEQA noise analysis is completely independent of the NEPA 23 Code of Federal Regulations (CFR) 772 analysis discussed in Chapter 3, which is centered on noise abatement criteria. Under CEQA, the assessment entails looking at the setting of the noise impact and then how large or perceptible any noise increase would be in the given area. Key considerations include: the uniqueness of the setting, the sensitive nature of the noise receptors, the magnitude of the noise increase, the number of residences affected, and the absolute noise level.

The proposed project would have a substantial noise increase that would affect approximately 50 residences in the project corridor. The dBA increase from the existing conditions to the Build Alternative 1 ranges from 12-20 dBA.

4.2 EFFECTS OF THE PROPOSED PROJECT

4.2.1 NO EFFECTS

With the absence of coastal zones, mineral resources, and wild and scenic rivers in or near the project area, the project would have no impacts on these resources. No further discussion of these issues is provided in this chapter. In addition, the project would have beneficial effects on circulation. Traffic and transportation is discussed in Section 3.1.6 of this EIS/EIR. Questions on the CEQA Environmental Checklist (Appendix A) have been addressed based on the discussions in Chapter 3 and below. The discussion below applies to both build alternatives, unless specifically noted otherwise.

4.2.2 LESS THAN SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT

Both build alternatives have the potential for environmental impacts on resources in the area as analyzed in Chapter 3. This section identifies resources for which there will be a "less than significant impact" (before mitigation).

<u>Common to Alternatives 1 & 2</u>

- Air Quality
- Geology and Soils
- Hazards and Hazardous Materials
- Public Services, other than parks
- Recreation
- Utilities and Service Systems
- Traffic/ Transportation
- Community Impacts
- Farmland
- Population and Housing
- Land Use

Analyses of these topics are provided in Chapter 3.

<u>No Build Alternative</u>

The No Build Alternative would not lead to any physical changes in the existing environment in the following resource areas:

- Aesthetics
- Air Quality
- Agriculture
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

4.2.3 SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROJECT COMMON TO ALTERNATIVES 1 & 2

This section identifies impacts that are "less than significant with mitigation" as follows:

- Aesthetics
  - Removal of Kinsey Mansion Neoclassical eclectic design-defining features such as the white picket fence and large half-circle private driveway, as well as the iconic lawn ornamentation would be cleared. (see *Environmental Consequences* and *Avoidance, Minimization, and Mitigation Measures* discussions in section 3.1.7 *Aesthetics/Visual Resources*)

- Biological Resources
  - See discussion below and section 3.3 *Biological Environment*.

- Cultural Resources
  - Historic property (Kinsey Mansion) would be adversely affected. (see *Environmental Consequences* and *Avoidance, Minimization, and Mitigation Measures* discussions in section 3.1.8 *Cultural Resources*)

- Paleontological Resources
  - Even shallow excavations in areas mapped as Pleistocene alluvial deposits, the Ridge Route Formation, the Hungry Valley Formation, and the Santa Margarita Formation have the potential to encounter paleontological resources. (see *Environmental Consequences* and *Avoidance, Minimization, and Mitigation* discussions in section 3.1.4 *Paleontological Resources*)

- Noise
  - See discussion below and section 3.2.7 *Noise and Vibration.*

- Hydrology and Floodplain

- Water Quality and Storm Water Runoff

Extensive analyses of these topics are provided in Chapter 3 and several are discussed in more detail below.

Biological Resources- If on-site relocation of individuals or on-site plantings are not possible after construction is complete, off-site mitigation shall be conducted. With the use of avoidance and minimization measures, on-site mitigation plantings and the purchase of mitigation parcels it is anticipated at this time that this project will not result in a net loss of Joshu tree woodland, alkali mariposa lily, mojave spineflower, sylvan microseris, Golden goodmaina.

Compensatory mitigation for impacts to jurisdictional features of USACE, SWRCB, and CDFW will be determined during the permitting process with the agencies with considerations to on-site restoration, off-site mitigation, and in-lieu fees. In general, the ratios are based on the amount and quality of the permanently and directly impacted jurisdictional features of the agencies.

The proposed project will result in the direct loss of foraging habitat for raptor species. To reduce the impacts to foraging habitat, similar habitat within the region should be preserved in perpetuity.

Noise- The increase in traffic noise caused by a project is the primary factor considered by Caltrans in assessing the significance of noise impacts under CEQA. The other key factor is the modeled absolute future noise level. Under CEQA, if the determination is made that a noise impact is significant, mitigation that is determined to be feasible must be incorporated into the project.

The Traffic noise study identified feasible solutions in the form of sound walls for these locations with significant noise impacts. However, these sound walls are being identified as not cost reasonable in Noise Abatement Decision Report (NADR) based on the reasonableness allowance of $80,000 per affected residence.

There are a number of locations with significant noise impacts (more than 12 dBA increase in noise level from the existing) which must be mitigated.

Since significant noise impacts must be mitigated, sound walls have been recommended and should be included in the final design even though they may not be cost reasonable. Since the NADR only recommends reasonable sound walls, it must be justified in the NADR that these sound walls are part of required mitigation measures to minimize significant noise impacts. The justification should refer to Section 7 of the Caltrans Traffic Noise Analysis Protocol relating to CEQA/significant noise impacts.

Sound walls 1 through 6 would mitigate the noise impacts in those locations where there are significant noise increases.

4.2.4 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL EFFECTS

Measures have been proposed to mitigate potentially significant adverse impacts of Alternatives 1 and 2; however, the following impacts would remain significant and unavoidable and are summarized below. Detailed impact analyses is presented in Chapter 3.

Farmlands – The project would require the acquisition of parcels zoned for agricultural use, but no relocations of any farm operations would be required. Projects where farmland may be adversely affected require close coordination with the NRCS, and completion of a Farmland Conversion Impact Rating Form. The rating form provides a basis for assessing the extent of farmland impacts relative to federally established criteria. The rating form is based on a Land Evaluation and Site Assessment (LESA) system, which is a numerical system that measures the quality of farmland.

Existing farmland-related land uses within the project footprint would be converted to transportation-related use. Over a period of time, adjacent land uses at these locations may potentially see changes from existing use towards commercial, business, and/or residential-based land uses. Although avoidance and minimization measures have been proposed, farmland conversion cannot be entirely avoided, and would result in unavoidable significant effects on farmlands within the project footprint.

Accordingly, Caltrans is in the process of requesting a determination from the local NRCS office as to whether the project location has farmland that is subject to the Farmland Protection Policy Act. The resulting NRCS Farmland Conversion Impact Rating would determine the relative value for agricultural production of the farmland to be converted by the proposed project as compared to other farmland in the surrounding area. The NRCS evaluates only Prime/Unique and Statewide/Local Importance classified land.

4.2.5 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

As discussed in the Cumulative Impacts section under each resource, the impacts of the build alternatives would be similar to each other, and construction would require the commitment of natural, physical, human, and fiscal resources. The loss of developed and undeveloped properties and use of the land that would be acquired for the project would be an irreversible and long-term commitment of this resource.

Construction would also require use of fossil fuels, water, and construction materials such as concrete cement, aggregate (i.e., sand and gravel), asphalt, steel, paint, fencing, pipes, and other materials that are generally not retrievable once they have been used to build a road.

Labor would be needed to produce construction materials, demolish existing structures and infrastructure, and build the new NW SR-138 facility; however, as a beneficial impact, the project would provide employment for local labor resources and would not adversely affect the availability of labor resources in the affected communities.

Construction of the project would require a substantial one-time expenditure of local, State, and federal funds, which are not retrievable; however, commitment of these resources would benefit residents, workers, travelers, businesses, and others throughout the area, region, and State from the improved quality of the transportation system. Improvements to local and regional mobility and accessibility are expected to outweigh the irreversible and irretrievable commitment of resources.

4.3 GROWTH INDUCING IMPACTS

The growth-related impacts of the proposed project was assessed using the *Guidance for Preparers of Growth-Related, Indirect Impacts Analyses by California Department of Transportation*. The guidance specifically deals with the subset of indirect effects that are referred to as "growth-related impacts" associated with highway projects that encourage or facilitate land use or development that changes the location, rate, type, or amount of growth.

Antelope Valley as a whole has experienced population, housing and employment growth and decline in the last century and is anticipated to grow at a slower pace through 2035. The growth projections adopted by SCAG (SCAG 2012 Regional Transportation Plan/Sustainable Communities Strategy [RTP/SCS] Growth Forecast, April 2012) indicate increases in both housing and employment within the westernmost portion of the study area. The central and eastern portion of the study area is projected to have little to no growth. Future growth is projected to focus on job creation to provide a better job and housing relationship and increasing the quality of life for existing and future residents.

Growth in the study area would be restricted by several factors. The primary restriction is a diminishing aquifer and water limitations. The Antelope Valley Regional Water Management Group (RWMG) 2013 Integrated Regional Water Management Plan (IRWMP) states that water supply in Antelope Valley is variable and uncertain and a fundamental challenge is that demand exceeds supply in dry years, which constrains future growth.

The majority of the study area falls under the Rural Preserve Area designation. Rural Preserve Areas are designated as Rural Land with a range of very low densities that reflect the underlying constraints, environmental resources, and safety hazards. These areas are largely undeveloped and generally not served by existing or planned infrastructure and public facilities. According to the Antelope Valley Area Plan, residents of Rural Preserve Areas should be prepared to forego additional infrastructure in order to live in a very remote rural environment and enjoy the benefits offered by such an environment. The Rural Preserve Area designation would serve to constrain development in much of the study area.

Under both alternatives, existing intersections would be improved and consolidated where appropriate to improve the access and operations of the facility. Also, operational improvements under these alternatives, such as improving site distances and bringing non-standard roadway features to standard, would help accommodate future demand, emergency access and improve connections to residential and business property located along the corridor.

SR-138 would operate at LOS A or B at all study segment locations due to the additional lane capacity provided under both of these alternatives in the opening year. The capacity improvements would meet the near-term increase in travel demand along the corridor and improve operations from LOS C and D in the western portion of the corridor to LOS A or B, and from LOS B to C in the central and eastern portions of the corridor to LOS A or B. Traffic volumes would not be expected to increase under 2040 condition for these alternatives.

Currently, SR-138 is not a controlled-access facility; access and egress point include at-grade intersections with paved and unpaved roads and driveways. Based on the operational and capacity improvements, Alternatives 1 and 2 would potentially change accessibility in the study area. Improving mobility, accessibility, and safety has the potential to enhance the attractiveness of the area for additional economic and residential development.

While highway improvements in general have the ability to enhance accessibility within local communities, both build alternatives would generally follow the existing alignment of SR-138 and would not accommodate new access points to and/or from the study area that would result in growth pressures in areas where such access does not presently exist. As a result, the proposed project would not provide access to areas previously inaccessible or improve access in ways that would foster local development beyond that which is already planned, and would not affect the rate, amount, or type of growth envisioned in the Antelope Valley Area Plan.

Growth in the study area would be based largely on market conditions. The proposed project would not change any existing constraints to growth. With or without the project, residential growth within the regional area would continue to be limited by natural resource constraints (e.g., water availability/supply), as well as geographic and regulatory factors (e.g., Rural Preserve Areas) that would guide future development to rural town center areas, rural town areas and economic opportunity areas. The proposed project would have a negligible degree of influence on regional growth. Because the project is not expected to influence growth, it would not result growth-related indirect impacts to environmental resources of concern.

4.4 CLIMATE CHANGE

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF6), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation.[5] In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest contributors of GHG emissions.6 The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: “greenhouse gas mitigation” and “adaptation.” "Greenhouse gas mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. “Adaptation" refers to planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).[7]

Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.[8] This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of sustainability.”[9] Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors up front in the planning process will assist in decision-making and improve

[5] https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014
[6] https://www.arb.ca.gov/cc/inventory/data/data.htm
[7] http://climatechange.transportation.org/ghg_mitigation/
[8] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[9] https://www.sustainablehighways.dot.gov/overview.aspx

efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

The Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR)): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of the Program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020. Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 *Federal Register* 52117 (October 8, 2009): This federal EO set sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. It instituted as policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities.

Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*, 80 Federal Register 15869 (March 2015). This EO reaffirms the policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities. It sets sustainability goals for all agencies to promote energy conservation, efficiency, and management by reducing energy consumption and GHG emissions. It builds on the adaptation and resiliency goals in previous executive orders to ensure agency operations and facilities prepare for impacts of climate change. This order revokes Executive Order 13514.

U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts* v. *EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010[10] and significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 miles per gallon by 2025. Because NHTSA cannot set standards beyond model year 2021 due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which NHTSA, EPA, and ARB will decide on CAFE and GHG emissions standard stringency for model years 2022–2025. NHTSA has not formally adopted standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 miles per gallon by 2025 was appropriate. In March 2017, President Trump ordered EPA to reopen the review and reconsider the mileage target.[11]

NHTSA and EPA issued a Final Rule for "Phase 2" for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

Presidential Executive Order 13783, *Promoting Energy Independence and Economic Growth*, of March 28, 2017, orders all federal agencies to apply cost-benefit analyses to regulations of GHG emissions and evaluations of the social cost of carbon, nitrous oxide, and methane.

State

With the passage of legislation including State Senate and Assembly bills and executive orders, California has been innovative and proactive in addressing GHG emissions and climate change.
Assembly Bill 1493, Pavley Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order S-3-05 (June 1, 2005): The goal of this executive order (EO) is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill 32 in 2006 and SB 32 in 2016.

Assembly Bill 32 (AB 32), Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG

[10] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq
[11] http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256 and https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse

emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-e
Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.
Senate Bill 97 (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Senate Bill 391 (SB 391), Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.
Executive Order B-16-12 (March 2012) orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

Executive Order B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

Senate Bill 32, (SB 32) Chapter 249, 2016, codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.
Governor Jerry Brown and other state leaders have committed to continuing efforts to address climate change.[12]

[12] https://www.nytimes.com/2016/12/26/us/california-climate-change-jerry-brown-donald-trump.html?_r=0

Environmental Setting

In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every 5 years. ARB approved the *First Update to the Climate Change Scoping Plan* on May 22, 2014. ARB is moving forward with a discussion draft of an updated Scoping Plan that will reflect the 2030 target established in EO B-30-15 and SB 32.

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, ARB released the GHG inventory for California.[13] ARB is responsible for maintaining and updating California's GHG Inventory per H&SC Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in Figure 72 represent a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists ARB in demonstrating progress toward meeting the 2020 goal of 431 $MMTCO_2e$.[14] The 2016 edition of the GHG emissions inventory (released June 2016) found total California emissions of 441.5 $MMTCO_2e$, showing progress towards meeting the AB 32 goals.

The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery. The total emissions expected in the 2020 BAU scenario include reductions anticipated from Pavley I and the Renewable Electricity Standard (30 $MMTCO_2e$ total). With these reductions in the baseline, estimated 2020 statewide BAU emissions are 509 $MMTCO_2e$.

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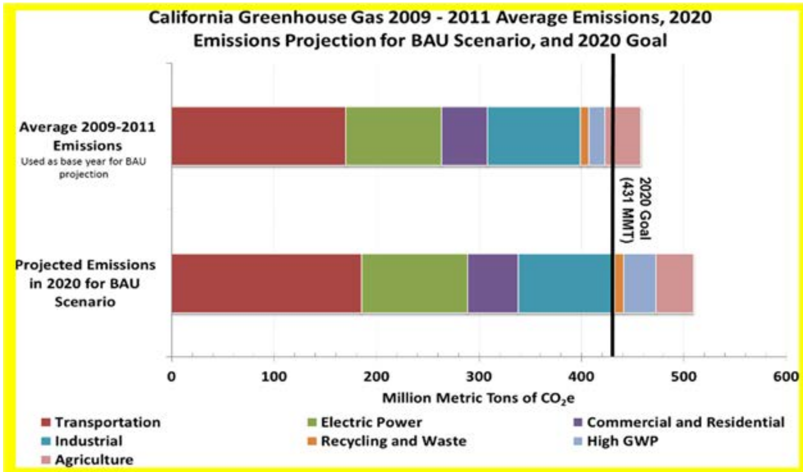
[13] 2016 Edition of the GHG Emission Inventory Released (June 2016): https://www.arb.ca.gov/cc/inventory/data/data.htm

[14] The revised target using Global Warming Potentials (GWP) from the IPCC Fourth Assessment Report (AR4)

Figure 72: 2020 Business as Usual (BAU) Emissions Projection 2014 Edition



Source: *https://www.arb.ca.gov/cc/inventory/data/bau.htm*

Project Analysis

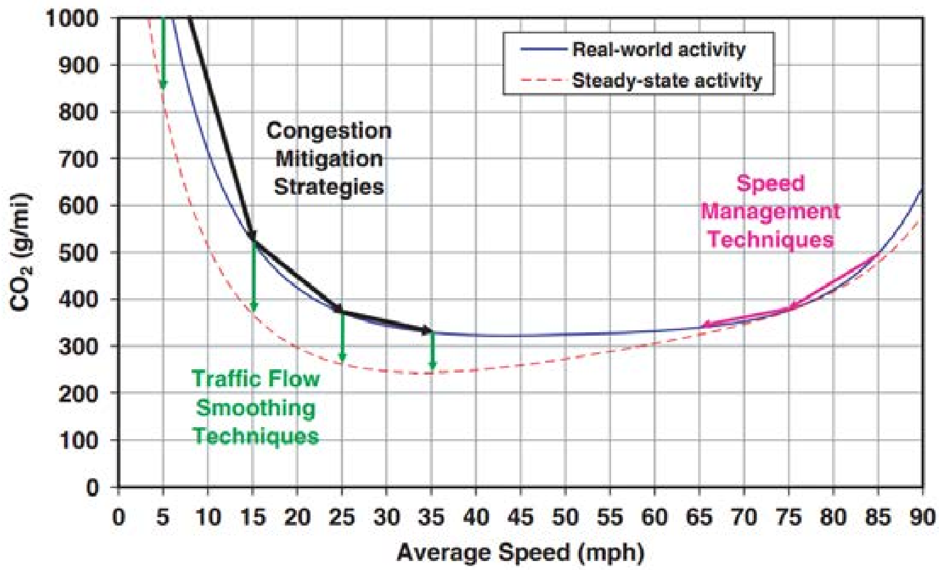
GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations.

4.4.1 OPERATIONAL EMISSIONS

Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity), (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued concurrently.

FHWA supports these strategies to lessen climate change impacts and correlate with efforts that the state of California is undertaking to reduce GHG emissions from the transportation sector.
The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (see Figure 73). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

Figure 73 Possible Use of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside, May 2010 (http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf)

Transportation accounts for the greatest proportion of GHG emissions on a regional and state level. As part of the RTP, transportation network improvements would be included, and more compact, infill, walkable and mixed-use development strategies to accommodate region growth would be encouraged to accommodate increases in population, households, employment, and travel demand. Additionally, while population growth has increased the number of vehicles on the road, vehicles have been getting cleaner pursuant to AB 1493. GHG emissions from transportation are expected to decrease by approximately 24 percent by 2040 compared to existing conditions (2012 Base Year) (SCAG 2016d).

The project is in the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was approved by the Regional Council of the Southern California Association of Governments (SCAG) on April 7, 2016 (RTP ID: 1122004; *Northwest 138 Corridor Improvement Project – approximately 36 miles, providing an improved 4 to 6 lane facility between I-5 and SR 14*). The project is also in the 2017 Federal Transportation Improvement Program (FTIP), which was found to be conforming by the FHWA/FTA on December 16, 2016 (Project ID: LA0G949*; Complete PA&ED to determine the alternatives for the approximate 36.8-mile east-west SR-138 highway facility between I-5 and SR-14 in northern Los Angeles County. The PA&ED will study and determine the alternatives (i.e., freeway and/or expressway), constraints (right-of-way requirements), potential impacts/improvements and conduct technical studies)*. The proposed project is consistent with the scope of the design concept of the FTIP. Therefore, the proposed project is in conformance with the State Implementation Plan (SIP). The proposed project was determined to be in local conformity.

In an effort to explore a multi-modal transportation option, a rail option was investigated in the scoping phase of the project. The Median Rail Alternative looked at the possibility of including a median wide enough for potential passenger rail service in the SR-138 corridor between I-5 and SR-14. However, the alternative caused severe environmental and cost impacts that were not considered feasible. In addition, rail is not identified in any regional transportation plan as an identified need for this corridor. Please refer to section 2.1.3 for further discussion on that alternative.

There is a possibility that some traffic currently utilizing other routes would use the new facilities, thus resulting in increased Vehicle Miles Travelled (VMT) within the project area. The impact of GHG emissions is a global rather than a local issue. However, due to lack of global models for project-level analyses, the impact of the Build Alternatives on GHG emissions was calculated using traffic data for the project region.

The potential impact of the proposed project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from EMFAC2014. The regional VMT for the existing, No Build, and each of the three build alternatives was estimated using the daily traffic volumes included in the Transportation Analysis Report (Fehr and Peers, June 2015). The VMT data, along with the EMFAC2014 emission rates, was used to calculate and compare the CO_2 emissions for the 2012, 2020, 2025, and 2040 regional conditions.

The CO_2 emissions numbers listed in the tables below are only useful for a comparison between project alternatives. The proposed project could potentially implement roundabout intersections rather than the stop sign or traffic signal-controlled intersections analyzed for Alternative 1. As with the MSAT emissions, implementing roundabouts would not affect the traffic volumes used to determine the GHG emissions, other than to reduce delay times, reduce queueing, and improve LOS compared to stop sign and signalized intersections. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions will be because CO_2 emissions are dependent on other factors that are not part of the model, such as the fuel mix (EMFAC model emission rates are only for direct engine-out CO_2 emissions, not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components), rate of acceleration, and the aerodynamics and efficiency of the vehicles.

As shown in the tables below, both Build Alternatives would result in an increase in CO_2 emissions within the region when compared to the No Build conditions. There would be no traffic-related difference between Alternative 1 without and with the Antelope Acres community bypass design option. Thus, there would be no difference in CO_2 emissions from this design option of Alternative 1. With the exception the No Build Alternative in 2020, when compared to the Existing (2012) conditions all of the future alternatives (No Build and Build) would result in a net increase in CO_2 emissions.

Table 138: 2012 Existing Greenhouse Gas Emissions (Metric Tons/day)

Alternative	CO_2
2012 Existing	257

Source: Air Quality Analysis, Caltrans (May 2017)
CO_2 = carbon dioxide

Table 139: 2025 Opening Year Greenhouse Gas Emissions (Metric Tons/day)

Alternative	CO_2
2012 Existing	257
2025 No Build	309
Change from Existing	*52*
Alternative 1	447
Change from Existing	*190*
Change from No Build	*138*
Alternative 2	436
Change from Existing	*178*
Change from No Build	*127*

Source: Air Quality Analysis, Caltrans (May 2017) and CT-EMFAC, Version 6.
CO_2 = carbon dioxide
CT-EMFAC = Caltrans Emissions Factors model

Table 140: 2040 Greenhouse Gas Emissions (Metric Tons/day)

Alternative	CO_2
2012 Existing	257
2040 No Build	369
Change from Existing	*112*
TSM Alternative	369
Change from Existing	*112*
Change from No Build	*0*
Alternative 1	617
Change from Existing	*360*
Change from No Build	*248*
Alternative 2	596
Change from Existing	*339*
Change from No Build	*227*

Source: LSA Associates, Inc. (May 2017) and CT-EMFAC, Version 6.
CO_2 = carbon dioxide
CT-EMFAC = Caltrans Emissions Factors model
TSM = Transportation System Management

Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO_2 emissions due to impacts on traffic. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal*

Emission Model (April 2008) and a 2009 University of California study,[21] brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO_2 emissions during a typical urban trip. Current emission-factor models do not distinguish the emission of such modal events (i.e., acceleration, deceleration) in the operation of a vehicle and instead estimate emissions by average trip speed. It is difficult to model this because the frequency and rate of acceleration or deceleration that drivers chose to operate their vehicles depend on each individual's human behavior, their reaction to other vehicles' movements around them, and their acceptable safety margins. Currently, the EPA and the CARB have not approved a modal emissions model that is capable of conducting such detailed modeling. This limitation is a factor to consider when comparing the model's estimated emissions for various project alternatives against a baseline value to determine impacts.

Other Variables

With the current understanding, project-level analysis of greenhouse gas emissions has limitations. Although a greenhouse gas analysis is included for this project, there are numerous external variables that could change during the design life of the proposed project and would thus change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2012,"[22] which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy improves each year with a noticeable rate of change beginning in 2005. Corporate Average Fuel Economy (CAFE) standards remained the same between model years 1995 thru 2003 and subsequently increasing to higher fuel economy standards for future vehicle model years. The EPA estimates that light duty fuel economy rose by 16% from 2007 to 2012. Table 141 shows the increases in required fuel economy standards for cars and trucks between Model Years 2012 and 2025 as available from the National Highway Traffic Safety Administration for the 2012–2016 and 2017–2025 CAFE Standards.

Table 141 Average Required Fuel Economy (mpg)

	2012	**2013**	**2014**	**2015**	**2016**	**2018**	**2020**	**2025**
Passenger Cars	33.3	34.2	34.9	36.2	37.8	41.1-41.6	44.2-44.8	55.3-56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.6-30.0	30.6-31.2	39.3-40.3
Combined	29.7	30.5	31.3	32.6	34.1	36.1-36.5	38.3-38.9	48.7-49.7
Source: EPA 2013, http://www.epa.gov/fueleconomy/fetrends/1975-2012/420r13001.pdf								

Second, new lower emissions and zero emissions vehicles will come into the market within the expected design life of this project. According to the 2013 Annual Energy Outlook (AEO2013):

[21] Matthew Bartha, Kanok Boriboonsomsin. 2009. *Energy and emissions impacts of a freeway-based dynamic eco-driving system.* Transportation Research Part D: Transport and Environment
Volume 14, Issue 6, August 2009, Pages 400–410

[22] http://www.epa.gov/oms/fetrends.htm

"LDVs that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG emissions and CAFE standards over the projection period. Sales of such vehicles increase from 20 percent of all new LDV sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case."[23]

The greater percentage of lower emissions and zero emissions vehicles on the road in the future will reduce overall GHG emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

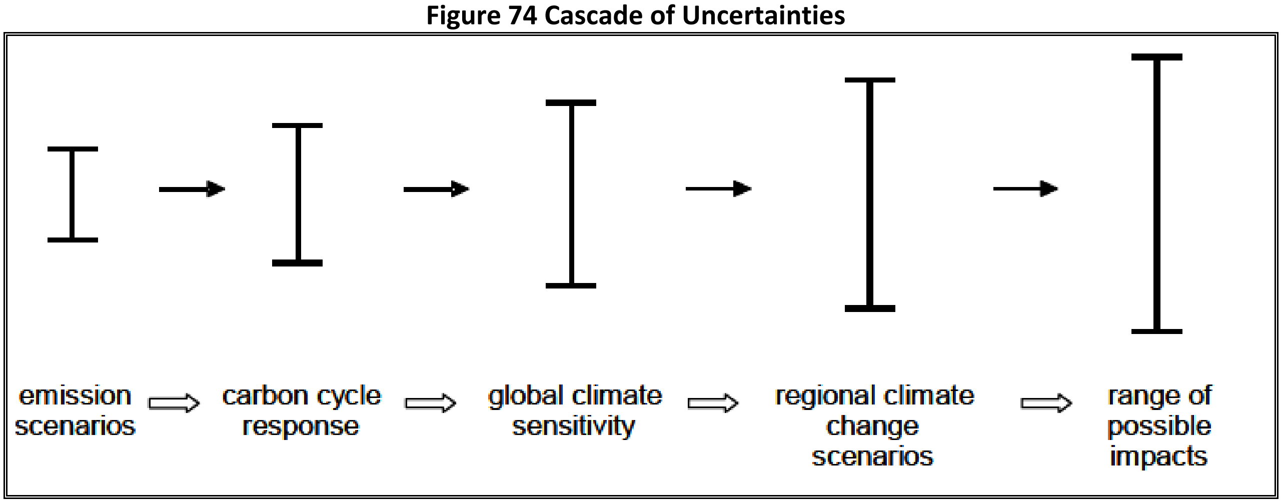
Third, California adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in title 17, California Code of Regulations, Sections 95480-95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

Limitations and Uncertainties with Impact Assessment

Taken from p. 5-22 of the National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards (July 2012), the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

"Moss and Schneider (2000) characterize the 'cascade of uncertainty' in climate change simulations Figure [74]). As indicated below in the Cascade of Uncertainties figure, the emission estimates used in this EIS have narrower bands of uncertainty than the global climate effects, which are less uncertain than regional climate change effects. The effects on climate are, in turn, less uncertain than the impacts of climate change on affected resources (such as terrestrial and coastal ecosystems, human health, and other resources […] Although the uncertainty bands broaden with each successive step in the analytic chain, all values within the bands are not equally likely; the mid-range values have the highest likelihood."[24]

Figure 74 Cascade of Uncertainties



[23] http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf
[24] http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf. page 5-22

Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO_2 equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce greenhouse gas emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO_2 from 2000 to 2030, which represents an increase of between 25 and 90%.[25]

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing "new" greenhouse gas emissions. It is difficult to assess the extent to which any project-level increase in CO_2 emissions represents a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

4.4.2 CONSTRUCTION EMISSIONS

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.
In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

Table 142 and Table 143 show maximum construction GHG emissions for Alternatives 1 and 2 and Early Implementation of Safety and Operation Improvements for Alternatives 1 and 2 respectively.

Table 142: Maximum Project Construction GHG Emissions – Alternatives 1 and 2

Project Phases	CO_2 (lbs/day)
Grubbing/Land Clearing (lbs/day)	19,031.3
Grading/Excavation (lbs/day)	46,334.4
Drainage/Utilities/Sub-Grade (lbs/day)	25,390.0
Paving (lbs/day)	7,204.0
Maximum (lbs/day)	46,334.4
Total (tons/construction project)	**17,725.5**

Source: LSA Associates, Inc. (August 2015).

[25] Intergovernmental Panel on Climate Change (IPCC). February 2007. Climate Change 2007: The Physical Science Basis: Summary for Policy Makers. http://www.ipcc.ch/SPM2feb07.pdf.

Table 143: Maximum Project Construction GHG Emissions –Early Implementation of Safety and Operation Improvements for Alternatives 1 and 2

Project Phases	CO_2 (lbs/day)
Grubbing/Land Clearing (lbs/day)	3,504.0
Grading/Excavation (lbs/day)	8,661.4
Drainage/Utilities/Sub-Grade (lbs/day)	5,063.6
Paving (lbs/day)	3,748.1
Maximum (lbs/day)	8,661.4
Total (tons/construction project)	**3,239.5**

Source: LSA Associates, Inc. (August 2015).

The following project features and standard contract specifications would contribute to reducing GHG emissions. Avoidance, Minimizations, and/or Mitigation Measures are summarized in Appendix F of this document. Section 3.2.6 also details the specifics of those measures, which are summarized below.

AQ-7 Landscaping reduces surface warming, and through photosynthesis, decreases CO_2. Landscaping would be provided where necessary within the corridor to provide aesthetic treatment, replacement planting, or mitigation planting for the project. The landscape planting would help offset any potential CO_2 emissions increase.

AQ-8 The project would recommend the use of energy-efficient lighting, such as light emitting diode (LED) traffic signals. LED bulbs—or balls, in the stoplight vernacular—cost $60 to $70 apiece but last five to six years, compared to the one-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the project's CO_2 emissions.

AQ-9 According to Caltrans Standard Special Provisions, idling time for lane closure during construction is restricted to 10 minutes in each direction. In addition, the contractor must comply with Title 13, California Code of Regulations (CCR) Section 2449(d)(3) that was adopted by the ARB on June 15, 2008. This regulation restricts idling of construction vehicles to no longer than 5 consecutive minutes. Compliance with this regulation reduces harmful emissions from diesel-powered construction vehicles.

Caltrans Standard Specifications for construction (dust control and air pollution control) will be adhered to in order to reduce emissions generated by construction equipment. Additionally, the SCAQMD and AVAQMD have established rules for reducing fugitive dust emissions.

SB 375 requires the ARB to set regional emissions reduction targets from passenger vehicles and SCAG to develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region. The project is included in the regional emissions analysis supporting the current 2016 RTP/SCS. Also, as described in section 3.1.1.2 *Consistency with State, Regional, and Local Plans and Programs*, the project supports Goal 6 of the RTP/SCS consistent by maintaining and/or enhancing existing bicycle and pedestrian facilities.

4.4.3 CEQA CONCLUSION

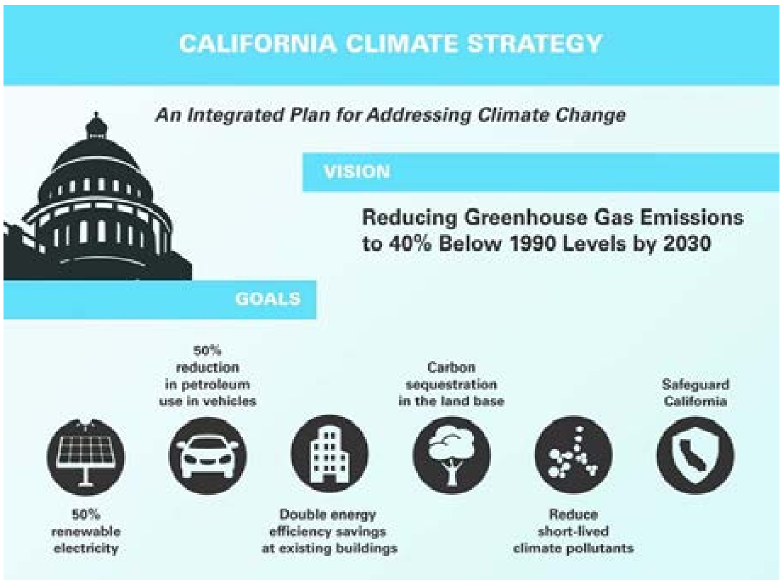
As discussed above, both the future with project and future no build show increases in CO_2 emissions over the existing levels; the future build CO_2 emissions are higher than the future no build emissions. There are also limitations with EMFAC and with assessing what a given CO_2 emissions increase means for climate change. Therefore, it is Caltrans' determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its cumulative contribution to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

4.4.4 GREENHOUSE GAS REDUCTION STRATEGIES

Statewide Efforts

In an effort to further the vision of California's GHG reduction targets outlined an AB 32 and SB 32, Governor Brown identified key climate change strategy pillars (concepts). These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 GHG emissions target. These pillars are (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, *Safeguarding California*.

Figure 75 The Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals



The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. One of Governor

Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030.

Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all of the other statewide transportation planning documents.

SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions
-

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several funding and technical assistance programs that have GHG reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in *Caltrans Activities to Address Climate Change* (2013).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a department policy that will ensure coordinated efforts to incorporate climate change into departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies
The following features will also be implemented in the project to reduce GHG emissions and potential climate change impacts from the project. These features include improving energy efficiency, reducing construction emissions, and enhancing multi-modal options that would reduce VMT.

1. Maintaining and/or enhancing existing bicycle and pedestrian facilities.

2. Caltrans has committed to re-planting or relocating sensitive vegetation that will be removed as part of the proposed project as part of BIO-47 and BIO-88. These plants could help offset any potential CO_2 emissions increases.

3. The project would incorporate the use of energy-efficient lighting, such as LED traffic signals. LED bulbs cost $60 to $70 each but last five to six years, compared to the one-year average lifespan of the incandescent bulbs previously used. The LED bulbs themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the project's CO_2 emissions. (See AQ-8 in sections 3.2.6, *Air Quality*, and 4.4.2, *Constructions Emissions*)

4. The contractor must comply with all local Air Pollution Control District's (APCD) rules, ordinances, and regulations for air quality restrictions.

Adaptation Strategies
"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage—or, put another way, planning and design for resilience. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

Federal Efforts
At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011, outlining the federal government's progress in expanding and strengthening the nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provided an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

The federal Department of Transportation issued U.S. DOT Policy Statement on Climate Adaptation in June 2011, committing to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions."

To further the DOT Policy Statement, on December 15, 2014, FHWA issued order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events). This directive established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.

FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels.

State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea-level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea-level rise and directed all state agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea-level rise. Sea-level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, and storm surge and storm wave data.

Governor Schwarzenegger also requested the National Academy of Sciences to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington* (Sea-Level Rise Assessment Report)[26] was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates; and the range of uncertainty in selected sea-level rise projections. It provided a synthesis of existing information on projected sea-level rise impacts to state infrastructure (such as roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems; and a discussion of future research needs regarding sea-level rise.

In response to EO S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, state, federal, and public and private entities, developed *The California Climate Adaptation Strategy* (Dec 2009),[27] which summarized the best available science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across state agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan).

[26] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.

[27] http://www.climatechange.ca.gov/adaptation/strategy/index.html

Governor Jerry Brown enhanced the overall adaptation planning effort by signing EO B-30-15 in April 2015, requiring state agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how state agencies are implementing EO B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

EO S-13-08 also gave rise to the *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), of which Caltrans is a member. First published in 2010, the document provided "guidance for incorporating sea-level rise (SLR) projections into planning and decision making for projects in California," specifically, "information and recommendations to enhance consistency across agencies in their development of approaches to SLR." The March 2013 update[28] finalizes the SLR Guidance by incorporating findings of the National Academy's 2012 final Sea-Level Rise Assessment Report; the policy recommendations remain the same as those in the 2010 interim SLR Guidance. The guidance will be updated as necessary in the future to reflect the latest scientific understanding of how the climate is changing and how this change may affect the rates of SLR.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation, and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is actively engaged in in working towards identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in EO B-30-15.

While estimates vary, sea level is expected to rise by anywhere from 31 to 69 inches by the year 2100. Although these projections are on a global scale, the rate of SLR along California's coast is relatively consistent with the worldwide average rate observed over the past century. Therefore, it is reasonable to assume that changes in worldwide SLR will also be experienced along California's coast. As the proposed project site is outside the coastal zone and at approximately 3,000 feet above sea level, direct impacts to transportation facilities due to projected SLR are not expected.

[28] http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/

CHAPTER 5 | COMMENTS AND COORDINATION

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: Project Development Team (PDT) meetings, interagency coordination meetings, community meetings, and public open house meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

5.1 COORDINATION PLAN

The California Department of Transportation (Caltrans) is the National Environmental Policy Act (NEPA) Lead Agency under the provisions of the Memorandum of Understanding (MOU) between the Federal Highway Administration (FHWA) and Caltrans Concerning the State of California's Participation in the *Surface Transportation Project Delivery 23 United States Code (USC) 327 NEPA Assignment*, which became effective on October 1, 2012. The MOU was signed pursuant to Title 23 USC 327, which allows the Secretary of Transportation to assign, and the State of California to assume, responsibility for FHWA's responsibilities under other Federal environmental laws. As this project is covered by the NEPA Assignment MOU, FHWA has assigned and Caltrans has assumed FHWA responsibility for environmental review, consultation, and coordination on this project.

The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A legacy for Users (SAFETEALU) was a transportation funding act that included a number of changes aimed at streamlining the environmental review process. The 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21) made further amendments to the environmental review process added by SAFETEA-LU and was codified at 23 USC 139. The Efficient Environmental Review Process mandated by 23 USC 139 applies to transportation projects requiring an Environmental Impact Statement (EIS), for which the original Notice of Intent (NOI) was published in the Federal Register after August 10, 2005. Lead agencies are required to develop a coordination plan to facilitate and document the interaction between lead agencies, participating and cooperating agencies, and the public.

A Coordination Plan was prepared by Caltrans in March 2014 to describe a communication process with participating and cooperating agencies. The following provides an overview of the agency coordination conducted to date. 23 U.S.C. 139 requires Caltrans to notify the Secretary of Transportation of the type of work proposed, including the general location, length and termini of the project, when the environmental review process would begin, and any anticipated federal permits and approvals. This notification was provided via transmittal of the Notice of Intent to the Secretary on November 13, 2013. Under the National Environmental Policy Act (NEPA), cooperating agencies are federal agencies that either has jurisdiction/ approval authority on part of the project (e.g., issuing a permit) or special expertise with respect to an environmental issue being evaluated in the EIS (or joint EIS/Environmental Impact Report [EIR]). Under MAP-21, participating agencies can be federal, state, tribal, regional, or local agencies that may have an interest in the project. Caltrans sent letters of invitation to 13 agencies to become a participating agency and 4 agencies to become a cooperating agency on the project. Subsequently, on February 13, 2014, one additional agency, the Federal Railroad Administration (FRA), was invited to become a cooperating agency but declined. A federal agency is assumed to be a cooperating agency and participating agency unless it formally declines an invitation or it fits into one of the following categories: (1) it has no jurisdiction or authority for the project; (2) it has no expertise or information relevant to the project; or (3) it does not intend to submit comments on the project.

Cooperating Agencies: Federal agencies, other than the Federal Lead Agency, who have jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project or project alternative. Cooperating agencies are also participating agencies.

Cooperating Agencies	Contact Person/Title	Phone/Email
Army Corps of Engineers	Crystal Huerta Veronica Li	(805)585-2143 Crystal.Huerta@usace.army.mil Veronica.Li@usace.army.mil
United States Environmental Protection Agency	Carolyn Mulvihill Clifton Meek Connell Dunning	(415) 947-3554 Mulvihill.carolyn@epa.gov (415) 972-3370; meek.clifton@epa.gov (415) 947-4161 Dunning.connell@epa.gov
Advisory Council on Historic Preservation	Carol Legard Federal Highway Liaison Office of Federal Agency Programs	(202) 606-8522 Clegard@achp.gov
United States Fish and Wildlife Service	Raymond Vizgirdas	Raymond_Vizgirdas@fws.gov

Participating Agencies: Federal, state, regional or local agencies that may have an interest in the project.

Participating Agencies	Contact Person/Title	Phone/Email
Los Angeles County Metropolitan Transportation Authority (Metro)	Isidro Panuco Project Manager	(213) 922-7984 Panucoi@metro.net
California Department of Fish and Wildlife	Ed Pert Regional Manager Jamie Jackson	(858) 467-4210 Ed.pert@wildlife.ca.gov (805) 382-6906 Jamie.jackson@wildlife.ca.gov
California Highway Patrol	Captain Gretchen Jacobs	(661) 948-8541 Gmjacobs@chp.ca.gov

Participating Agencies	Contact Person/Title	Phone/Email
County of Los Angeles, Department of Regional Planning	Carl Nadela Community Studies North Section	(213) 974-6476 Cnadela@planning.lacounty.gov
County of Los Angeles, Department of Parks and Recreation	Julie Yom	(213) 351-5127 Jyom@parks.lacounty.gov
County of Los Angeles, Department of Public Works	Daniel Quintana, Andrew Ngumba	Dquintana@dpw.lacounty.gov Angumba@dpw.lacounty.gov
Southern California Association of Governments	Courtney Aguirre Regional Planner	(213) 236-1804 Aguirre@scag.ca.gov
City of Lancaster, Planning Department	Brian Ludicke Planning Director Allen Thompson Assistant Utility Services Manager Michelle Cantrall	(661) 723-6105 Bludicke@cityoflancaster.gov (661) 945-6896
City of Palmdale, Planning Department	Susan Koleda Senior Planner	(661) 267-5200 Skoleda@cityofpalmdale.org
City of Palmdale, Public Works Department	Mike Behen Transportation/GIS Manager Jim Deyo	(661) 267-5337 Mbehen@cityofpalmdale.org
Natural Resources Conservation Service	Hudson Minshew District Conservationist	(661) 945-2604 ext.110 Hudson.minshew@ca.USDA.gov
Antelope Valley Resource Conservation District	Debra Gillis Executive Director	(661) 305-3405 Debragillis@sbcglobal.net
Lahontan Regional Water Board	Jan Zimmerman	(760) 241-7376 Jan.zimmerman@waterboards.ca.gov
State Water Resources Control Board	Bob Solecki	(916) 341-5483 Robert.Solecki@waterboards.ca.gov

Participating Agencies	Contact Person/Title	Phone/Email
California High Speed Rail Authority	Michelle Boehm Karl Fielding	(310) 896-5275 fieldingk@pbworld.com

** Pursuant to 23 USC 139, all cooperating agencies are also participating agencies.*

***A Federal agency invited shall be designated as a participating agency unless the agency declines the invitation by the deadline specified, and states that the agency (1) has no jurisdiction or authority with respect to the project, (2) has no expertise or information relevant to the project, and (3) does not intend to submit comments on the project.*

Coordination meetings were held at the Caltrans District 7 office in downtown Los Angeles on March 25, April 1, 2014, December 16, 2014 and June 16, 2015 for those agencies that had accepted the invitation to be a participating or cooperating agency. The purpose of the meetings were to update the attendees on the progress of the project; gain input on the project Purpose and Need and range of alternatives; collaborate on impact assessment and methodologies, socio-economic and environmental impacts and discuss any issues/concerns related to the project. In addition, the meetings provided an opportunity to identify the permits and approvals needed for project implementation. The permits and approvals needed, as well as the status of these permits, is summarized in Section 2.1.6 of this document.

5.2 SCOPING PROCESS

The scoping process started with widespread notice to government agencies via publication of a Notice of Intent (NOI)/Notice of Preparation (NOP) announcing the start of work on an EIR/EIS. The NOI was published in the Federal Register on November 13, 2013, in accordance with NEPA. The NOP was filed with the State Clearinghouse on November 6, 2013, in accordance with the California Environmental Quality Act (CEQA). The State Clearinghouse posts the NOP on its Web site and distributes it to State agencies. Comments on the NOI/NOP were received from 7 agencies and included comments on a variety of environmental issues.

AGENCY	COMMENT
Department of Defense	- Requests coordination with Edwards Air Force base.
Environmental Protection Agency	- Accept Participating/Cooperating Agency role. - Provided recommendations for water and wetland resources, biological resources, construction emissions and environmental justice issues to address impacts and provide avoidance and mitigation measures.
California Department of Fish and Wildlife (CDFW)	- Accepts Participating Agency role but requests that a Memorandum of Understanding (MOU) is signed. - Wildlife Corridor Study should be conducted. - The Environmental Document should include information on listed species impacts. - Mitigation should be provided for any impacts to the biological environment.

California Department of Water Resources (DWR)	- The proposed project would cross the DWR's California Aqueduct and therefore Caltrans will be required to obtain an encroachment permit from DWR. - Any modifications to DWR's bridge and access roads will be reviewed and approved by DWR prior to construction.
Los Angeles County Fire Department	- Any road closures/ detours have the potential to impact emergency response times and must be coordinated with Fire Dept. - Prior to construction, provide 3 sets of detour plans with planned closures. - Notify Fire Dept. at least 3 days in advance of any street closures. - Disruptions to water service must be coordinated and alternative water sources must be provided. - Statutory responsibilities of the County Fire Department include: erosion control, watershed management, rare and endangered species, vegetation, cultural resources, the County Oak Tree Ordinance, and fuel modification for very high fire hazard zones.
Lahontan Regional Water Quality Control Board	- The project is within both the Los Angeles County and Lahontan Regional Water Quality Control Board jurisdictions. - All surface waters are waters of the state and the project will require coordination with the Regional Water Quality Control Boards as well as the U.S. Army Corps of Engineers for federal waters. - Beneficial uses of the water resources should also be identified in the Environmental document. - Wetland impacts should be avoided. - Post construction stormwater management should be considered and vegetation clearing should be kept to a minimum. - Various permits will be required for the proposed project (see full letter).
Native American Heritage Commission (NAHC)	- The appropriate Information Center should be contacted for a record search. - Mitigation plans should include provisions for accidentally uncovered archaeological or cultural remains.

Letters were sent to federal, State, regional, local government agencies, and the public inviting them to scoping meetings, held on March 14, 2014 and March 18, 2014.

Public Scoping Meetings
Antelope Acres Community Center
8812 W Ave E-8
Antelope Acres, CA 93536
Saturday, March 15, 2014, 9:30am - 11:30am

Grace Chapel Neenach
25649 W Ave D
Lancaster, CA 93536
Tuesday, March 18, 2014, 6:30pm - 8:30pm

The comments from the scoping meetings focused on the following issues: Water supply, maintaining the rural setting of the area, right-of-way impacts, safety improvements, bicycle corridor enhancements, and support for the option that does not displace residents.

5.2.1 Scoping follow-up

OPEN HOUSE MEETINGS
Two Community Open House Meetings were held on May 2 and 4, 2015 to give the public a project update. For ease of access, one of the meetings was held on the Western side of the Northwest 138 Corridor and the other one at the Eastern side. In addition, one of the meetings was offered on a Saturday morning (9:30am – 11:30am) and the other during evening hours (6:30pm – 8:30pm) on a Monday.

Approximately 180 people attended the meetings; 110 on May 2nd and 70 on May 4th. Each of the meetings featured an open house format allowing the public to receive updates through information stations and to have their questions answered by technical staff.

Community	Date / Time	Location/Address
West Corridor Communities	Saturday, May 2, 2015 9:30am – 11:30am	Grace Chapel Neenach 25649 W Av D Lancaster, CA 93536
East Corridor Communities	Monday, May 4, 2015 6:30pm – 8:30pm	William J. Fox Airfield - Lobby 4555 W Av G Lancaster, CA 93536

All meeting participants were provided a meeting packet which included a copy of the Alternatives fact sheet, meeting flyer, and an overview of the web-based interactive map that is publically accessible on the project website. A range of informational exhibits were featured to provide general project information and to present new information on the Northwest 138 Corridor and alignment alternatives. Below is a list of the exhibits that were provided at the Community Open House Meetings.

- Purpose and Need
- Environmental Review Process Chart
- Scoping Comments Summary
- Alternatives Map
- Range of Alternatives Overview
- Alternative 1 Freeway/Expressway – Map and cross sections
- Alternative 2 Expressway/Conventional Highway – Map and cross sections
- TSM Alternative – Map and cross section
- Large plot maps for segments of the corridor featuring the alternative alignments and interchanges, intersections, and access points
- Interactive Map for the Northwest 138 Corridor
    - Exhibit Board and iPad stations for access to the web-based interactive map
- Stay Connected – Project contact information

<u>Issues Raised by the Public at the Open House Meetings</u>
The following is a general overview of the issues raised by the public at the Community Open House Meetings through individual discussions between stakeholders and Northwest 138 Corridor staff:

- Concerns about impacts to private property, including:
    - Access to property
    - Property values
    - Eminent domain

- Environmental impacts
    - Noise impacts during and after construction
    - Impacts to residents
    - Impacts to wildlife

- Access to new transportation facility
    - Interchange and intersection operations and design
    - Opposition to signalized intersections

- Alternatives
    - Support and opposition to alignment options in Antelope Acres area
    - Discussion regarding alignments in the Neenach area

- Project Schedule
    - Construction timing and phasing
    - Timing of Draft environmental documents and next steps
    - Employment opportunities

A variety of methods were used in advance of the Community Open House Meetings to encourage public participation. All forms of noticing provided meeting details (dates, times, locations, and language needs) as well as contact information for accessing additional project section details. Notification methods for the Open House meetings included mailing of notices, electronic distribution, media coverage, and stakeholder coordination. Postcard notices for the Community Open House

Meetings were mailed to approximately 6,105 addresses, including those on the project stakeholder database and other property owners and residents within a ½ mile buffer along State Route 138 and populated areas beyond this buffer (e.g. Antelope Acres). See Figure 76 for the zone of distribution. The postcard notice included information for the two meetings language needs, and other project contact information.

An electronic version of the flyer was distributed via email to 1,111 contacts included in the project stakeholder database. The notice was sent out twice in advance of the start of the Community Open House Meetings. The electronic public notice was also shared with local cities, town councils, agencies, elected officials, and key stakeholder groups for posting on their respective websites, newsletters, social media, and other communication outlets. There were a number of articles published prior, during, and after the Community Open House Meetings

Articles Covering the Open House Meetings (Partial List)

Date	Publication	Article
April 16, 2015	*SCVNews.com*	"May 2, 4: Public Meetings on Highway 138 Corridor Plan"
April 21, 2015	*AV Press*	"MTA & LA County Meetings target Highway 138"
April 29, 2015	*Toll Road News*	"Public Meetings for SoCal Northwest 138 Corridor Project"
May 1, 2015	*The Mountain Enterprise*	"Upcoming & Ongoing plus Regular Weekly and Monthly Events"
May 15, 2015	*The Mountain Enterprise*	"Will SR-138 become a six-lane freeway?"
Source: Arellano Associates, 2015.		

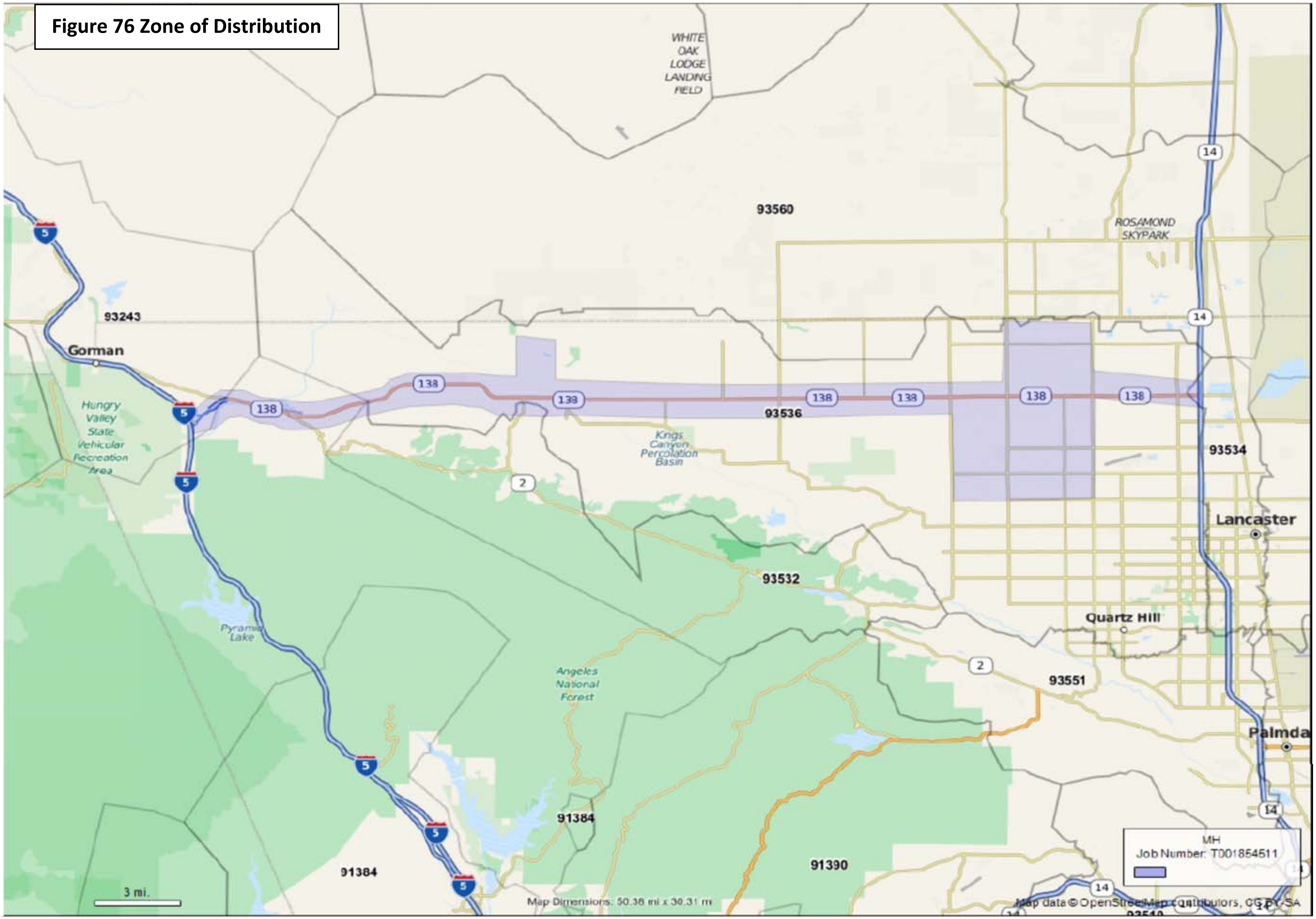
STAKEHOLDER BRIEFINGS

Following the Public Scoping Meetings in March 2014, representative elected offices, cities, town/neighborhood councils, stakeholder organizations and local residents have been reached through additional participation opportunities. The contacts generated through these additional engagement opportunities were added to the stakeholder database for future notification efforts, including the noticing for the upcoming Community Open House Meetings.

Summary of Outreach Activities (March 2014 to April 2015)

No.	Meeting	Date	Category
1.	Los Angeles County Air Show (2-day event)	March 21-22, 2014	Event
2.	AVBOT Transportation Committee	May 8, 2014	Stakeholder Organization
3.	Rosamond Municipal Advisory Council	May 15, 2014	Stakeholder Organization
4.	High Desert Cyclists	May 19, 2014	Stakeholder Organization
5.	Department of Water Resources	May 30, 2014	Agency Staff
6.	Los Angeles Department of Water and Power (LADWP)	June 3, 2014	Agency Staff
7.	NCTC TAC Meeting	July 21, 2014	Agency Staff
8.	NCTC Board	August 27, 2014	Agency Staff
9.	Office of Supervisor Antonovich	September 11, 2014	Agency Staff
10.	Association of Rural Town Councils (ARTC)	September 24, 2014	Stakeholder Organization
11.	Los Angeles County Coordination Meeting	October 8, 2014	Agency Staff
12.	Antelope Acres Town Council (Original)	October 15, 2014	Stakeholder Organization
13.	Antelope Acres Town Council (Elected)	October 15, 2014	Stakeholder Organization
14.	Fairmont Town Council	October 16, 2014	Stakeholder Organization
15.	William R. Barnes, Property Owner	October 21, 2014	Stakeholder
16.	Oso (Neenach) Town Council	October 23, 2014	Stakeholder Organization
17.	Historical Telephone Repeater Station	November 5, 2014	Stakeholder Organization
18.	Jeff Zimmerman, Resident	November 5, 2014	Stakeholder
19.	Three Points / Liebre Mountain Town Council	November 8, 2014	Stakeholder Organization
20.	Tejon Ranch	December 9, 2014	Stakeholder Organization
21.	AVBOT Business Outlook Conference	February 27, 2015	Event
22.	Los Angeles County Air Show - (2-day event)	March 21-22, 2015	Event
23.	Office of Supervisor Antonovich	April 7, 2015	Agency Staff
24.	Antelope Valley Board of Trade (AVBOT)	April 9, 2015	Stakeholder Organization

Figure 76 Zone of Distribution



5.3 PUBLIC REVIEW OF THE ENVIRONMENTAL DOCUMENTS

The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) prepared for this project was circulated for public review between August 5, 2016 and September 19, 2016. Caltrans, i cooperation with Metro, held two public hearings in August 2016. All comments received during the public review period have been considered and responded to. This Final EIR/EIS was prepared to add all public comments and incorporate any changes to the project design, environmental setting, and impacts that have occurred since the Draft EIR/EIS was completed.

5.3.1 NOTIFICATION OF PUBLIC HEARINGS

In order to promote maximum public awareness, a variety of noticing methods were implemented in advance of the Public Hearings. These included mailing of notices, flyer distribution, electronic distribution, display advertisements, media coverage, social media, and stakeholder coordination and briefings. All forms of noticing provided meeting details (dates, times, locations, and language service as well as contact information for accessing additional project details. Additionally, each notice incluc details on the public comment period as well as information on the Live Webcast.

4.3.2 Mailing of Notices

Full color bilingual (English and Spanish) postcard notices for the Public Hearings were mailed to approximately 10,128 addresses, including 1,512 stakeholders in the project database and 8,616 property owners and occupants within 1.5 miles from the centerline of the project footprint.

5.3.3 Flyer Distribution and Extended Outreach

Full color bilingual (English and Spanish) flyers announcing the Public Hearings were distributed to offices of elected and city officials, libraries, community centers, city halls, senior centers, and other public centers. These extended outreach efforts were further augmented by requesting support to promote the meetings through their respective electronic communication tools, including websites, e newsletters, social media sites, and membership e-blasts.

Target contacts included key community representatives that would help promote the public meetin including 33 elected official staff representatives, chambers, school districts, homeowner association (HOAs), neighborhood councils, environmental justice groups, community groups, businesses and business associations, academic institutions, and other local interest groups involved in transportatio environmental sustainability, and social issues in the region.

5.3.4 E-blasts

An electronic version of the flyer (Appendix B) was distributed via e-blast to 1140 email contacts included in the project database a total of four times in advance of the public meetings. The first noti was shared two weeks in advance of the first Public Hearing meetings (Aug. 5). The second notice wa distributed one week weeks prior to the first meeting (Aug.18), the third e-blast was sent two days p to the first meeting as a reminder (Aug. 23), and the fourth was sent two days prior to the final meeti (Aug. 26). The electronic public notice was also featured on Metro's Regional Rail website and on its Facebook and Twitter pages.

In addition, three e-blasts were sent following the meetings to 1,175 contacts in order thank participants for their participation at the Public Hearings as well as to provide access to the informati shared at the public meeting. This included a link to the webstream video. Additionally, the e-blast encouraged recipients to provide comment on the DEIR/DEIS prior to the September 19th conclusion of the comment period.

5.3.5 Display Advertisements

Display advertisements were featured in approximately 14 publications (print and/or electronic) to advertise the Public Hearings to communities within the project area. The advertisements were featured in local newspapers, newsletters, local publications and Spanish language publications.

No.	Publication	Communities Reached	Circulation	Notice Date
1.	Aerotech News-Desert Eagle (Edwards AFB)	Edwards AFB on-base, Lancaster, Palmdale	15,000	8/19
2.	Aerotech News-Desert Eagle (Edwards AFB) - Web	Edwards AFB on-base, Lancaster, Palmdale	3,251 (Impressions)	8/23
3.	Antelope Valley Free Classifieds	All Antelope Valley	15,000	8/16
4.	Antelope Valley Journal	All Antelope Valley, portions of western San Bernardino County in the high desert.	300	8/19
5.	Antelope Valley Press	All Antelope Valley	16,947	8/14
6.	Antelope Valley Press - Web	All Antelope Valley	616,662 (Impressions)	8/6 – 9/4
7.	El Sol Del Desierto	All Antelope Valley, portions of western San Bernardino County in the high desert.	14,000	8/16
8.	La Gaceta	All Antelope Valley, Santa Clarita Valley	20,000	8/6
9.	La Opinion	Southern California	65,000	8/22
10.	LA Times	Antelope Valley, San Fernando Valley, Ventura County	122,000	8/22
11.	Lake Los Angeles News	Lake Los Angeles	3,724	8/19
12.	Lakes & Valleys Gazette	Southwestern Antelope Valley: Leona Valley, Lake Hughes, Elizabeth Lake, Green Valley, Three Points	2,400	8/6

No.	Publication	Communities Reached	Circulation	Notice Date
13.	Mountain Enterprise	Frazier Park, Gorman, western Antelope Valley	2,550	8/18
14.	Rosamond News	Rosamond	10,120	8/19
		Total Reach (approximate):	**914,260**	
Source: Arellano Associates, 2016.				

5.3.6 Social Media Coverage

In addition to the display ad noticing efforts, online advertisements on Facebook and Twitter also targeted users residing in the project area.

No.	Platform	Zip Codes Targeted	Circulation	Posting Date/Date Range
1.	Facebook	93225 93243 93532 93534 93535 93536 93551 93560	393,228	8/5/ - 9/19
2.	Twitter	93225 93243 93532 93534 93535 93536 93551 93560	345,057	8/5 - 9/19
		Total Reach (approximate):	**393,630**	
Source: Arellano Associates, 2016.				

4.4 PUBLIC HEARINGS

Overview of Public Hearings

Caltrans, in cooperation with Metro, conducted a total of two Public hearings (on August 25 and August 27, 2016. The Community Open House Meeting on Thursday, August 25th, was held from 5:30 p.m. to 7:30 p.m., and the meeting on Saturday, August 27th, was held from 9:30 a.m. to 12:00 p.m. Each of the meetings featured an open house format allowing the public to receive updates through information stations and to have their questions answered one-on-one by technical staff. A brief presentation was also featured at the meetings to present proposed route concepts, project schedule and next steps. In addition, one meeting was offered as a live webcast and one meeting was offered as a dual Spanish and English language meeting.

The webcast was conducted to reach members of the public that were not able to attend in person, and to augment the level of participation. The live webcast generated an additional 28 online participants. In order to provide ongoing access to the presentation, the webcast recording was posted to the Metro's YouTube page for access through the life of the project. Additionally, a Spanish language presentation was recorded and also uploaded to the Metro's YouTube page. As of November 30, 2016, the English recording has generated 71 views, and the Spanish recording has generated 27 views.

Community Open House Meetings Locations and Additional Features

Meeting	Date	Location/Address	Additional Features
PUBLIC HEARING #1	Thursday, August 25	General William J. Fox Airfield – Lobby 4555 W Ave G Lancaster, CA 93536	– Court Reporter present
PUBLIC HEARING #2	Saturday, October 17	Grace Chapel Neenach 25649 W Ave D, Lancaster, CA 93536	– *Live Webcast* – Court Reporter present
Source: Arellano Associates, 2016.			

Summary of Public Participation

Through the two Public Hearings, approximately 114 people attended and 10 comments cards were collected. Additional meeting details, including key stakeholder participants and media coverage are listed in the table below.

Summary of Open House Meetings

Meeting Location & Date	No. of Participants	No. of Comment Cards Completed	No. of Speaker Cards Completed	Media Coverage	Elected Officials, Agencies, and other Stakeholder Representatives
Public Hearing #1 August 25, 2016	61	6	7	• Julie Drake – AV Press	• Russell Williams – Office of Assemblymember Tom Lackey, 36th District • Jonathan P. Canuela – California Department of Water Resources • John Currado – AVBOT • Cathy Hart – Southern California Edison • Allison Thompson – City of Lancaster • Julie Schuder – Antelope Acres Town Council • Dietter Aragon - Antelope Valley Transit Authority • Norman L. Hickling – Antelope Valley Transit Authority
Public Hearing # 2 Spanish & English Meeting August 27, 2016	52	4	16	• Patric Hedlund – The Mountain Enterprise	• Ginger Stout – Antelope Acres Town Council • Richard Skaggs – DSO Town Council • Greg Kimura - CATC
TOTAL	**113**	**10**	**23**		
Source: Arellano Associates, 2016.					

Summary of Key Community Issues

Total number of comments: 98

- 61 comments submitted via email
- 25 comments via oral testimony at the public hearings
- 11 comment cards collected at the public hearings
- 1 comment submitted via direct mail

Alternative 1

- A majority of the comments relating to Alternative 1 were in opposition (12 out of 17)
    - Alternative 1 – 7 comments opposing
    - Alterative 1 + Option – 7 comments opposing
- A total of 5 comments were in support for this alternative
    - Alternative 1 – 4 comments in favor of
    - Alterative 1 + Option – 1 comment in favor of

Alternative 2

- A vast majority of the comments relating to Alternative 2 were in favor (21 out of 22)
- Only one comment was opposed to Alternative 2

Other Alternatives

- There were 22 *other suggested alternatives* that either significantly modified one of the proposed alternatives or suggested an entirely new route.

Key Discussion Topic: Roundabouts

- 7 of the 8 comments regarding roundabouts were against this intersection treatment option
- Only one comment favored this intersection treatment option

The chart below outlines the range of specific issue categories (ranked from most to least frequent) that were raised in the comment records.

Public Comment Issues	#
Safety	17
Traffic & Transportation	13
Pollution	12
Property Concern	9
Funding & Cost	9
Birds & Wildlife	9
Roundabouts	8
Noise	7
Historic Property & Resources	4
hope to be notified	4
Against Tearing up the old highway	3
Project Timeline	3
Right of Way	3
Specific language change	2
Section 4(f) Properties	1
Ask for more Alt	1
Flood	1
Visual & Aesthetics	1

5.5 CONSULTATION AND COORDINATION WITH PUBLIC AGENCIES

Numerous early coordination meetings occurred between Caltrans and resource agencies such as USFWS, CDFW, and USACE. In general, the purpose of these meetings was to provide agency personnel with the latest project design information, proposed approaches to survey protocol, impact analysis, and to evaluate potential mitigation measure potential. The input from agencies was also helpful with regard to all of these topics, especially design criteria, survey protocol, and impact analysis. The consultation is divided by resource area and shown below.

5.5.1 Cultural Resource Coordination

Native American consultation commenced in April 2014 in a letter requesting the Native American Heritage Commission (NAHC) perform a search of the Sacred Lands File. This request was followed with letters, telephone calls, and an in-person meeting in January 2015 with the Native American contacts listed for the project area. This consultation is on-going. Three historical societies with an interest in the project area were also contacted during the survey and property identification phase of the cultural resources studies.

Historic properties in the Project's Area of Potential Effects (APE) were identified and evaluated in an Archaeological Survey Report (ASR) (August 2015), a Historic Resources Evaluation Report (HRER) (August 2015), a Supplemental ASR (August 2015), an Archaeological Evaluation Report (May 2016), and a Second Supplemental ASR (November 2016). The Historic Property Survey Report (HPSR), along with the reports completed in 2015, was submitted to the State Historic Preservation Officer (SHPO) on December 28, 2015. A revised AER was submitted to the SHPO on May 13, 2016. The SHPO made concurrences and findings in letters dated February 26, 2016, and June 9, 2016.

The SHPO concurred with Caltrans' determination that the following is eligible for the National Register of Historic Places (NRHP):

- Prehistoric archaeological site P19-004640 (CA-LAN-4640)

The SHPO determined that the following are to be treated as eligible for the NRHP for the purposes of this undertaking only:

- Prehistoric archaeological site P19-004620 (CA-LAN-4620)
- Northernmost portion of prehistoric archaeological site P19-003723 (CA-LAN-3723)

The SHPO concurred with Caltrans' determination that the following built environment resources are eligible for the NRHP:

- Kinsey Mansion (33700 W. Lancaster Blvd., Lancaster, CA)
- Bell Telephone and Telegraph Switching Station (34860 Lancaster Road, Lancaster, CA)

Caltrans has determined that the undertaking as a whole will have an Adverse Effect on historic properties pursuant to Section 106 PA Stipulation X.C. Concurrence from SHPO on this determination was obtained on April, 11, 2017. A project-specific Programmatic Agreement was executed on June 23, 2017.

5.5.2 Section 4(f) Coordination

Properties subject to the provisions of the requirements of Section 4(f) of the U.S. Department of Transportation Act are publicly owned parks and recreation areas, wildlife and waterfowl refuges of national, State, or local significance, and historic sites of national, State, or local significance. Please see appendix B for more information relating to Section 4(f) resources. For Section 4(f), the following agencies were requested for input about the potential Section 4(f) properties in the area:

- The US Forest Service,

- The CA State Parks Department
- CA Department of Water Resources
- Los Angeles County Department of Parks and Recreation
- Los Angeles Department of Water and Power
- The Mountain Recreation and Conservation Authority
- The Desert and Mountain Conservation Authority
- State Parks, Hungry Valley District
- State Parks, Tehachapi District

On July 7, 2014 there was a meeting with Caltrans, the US Forest Service, and Tejon Ranch to discuss the Pacific Crest Trail. There were also various phone discussions and email correspondence regarding the designated purpose, land ownership, significance of the resources within their jurisdiction and project impacts on them. Coordination for historic properties are done under the Section 106 process.

5.5.3 Biological Resource Coordination

Throughout the project planning process early coordination meetings occurred between Caltrans and resource agencies such as U.S. Fish and Wildlife Service, CA Department of Fish and Wildlife, Army Corps of Engineers, EPA and CA Regional Water Quality Control Boards. In general, the purpose of these meetings was to provide agency personnel with the latest project design information, proposed approaches to survey protocol, impact analysis, and to evaluate potential mitigation measures. Below is a table summarizing the contact with these resource agencies.

Table 129: Biological Resource Agency Coordination Summary

Date	Agency Personnel Involved	Meeting Type	Comments
11/6/2013	CDFW, RWQCB	Memo	Caltrans published the Notice of Preparation with the State Clearinghouse (SCH #2013111016).
11/13/2013	USFWS, EPA	Memo	Caltrans published the Notice of Intent within the Office Federal Register.
1/15/2014	CDFW	Memo	Caltrans received official comments from CDFW in regard to the Notice of Preparation.
1/22/2014	CDFW	Email	Caltrans biologist emailed project details and potential studies required.

Date	Agency Personnel Involved	Meeting Type	Comments
2/28/2014	USFWS	Email	Caltrans biologist emailed project description and proposed studies to USFWS Ventura Office.
03/25/2014	CDFW, USFWS, RWQCB, EPA	Meeting	Caltrans hosted an agency coordination meeting to discuss the project details and purpose and need.
6/30/2014	USFWS	Email	Official Threatened and Endangered Species List downloaded from USFWS website.
7/16/2014	CDFW	Email	Confirmed study limits and need for desert tortoise surveys.
7/28/2014	USFWS	Email	Caltrans biologist received email correspondence from USFWS staff assigned to the project, resulting in moving forward with scheduled biological surveys.
8/28/2014	CDFW	In Person	Caltrans biologist met with CDFW to discuss surveys done up until that point and the need for future surveys.
12/16/2014	CDFW, USFWS, RWQCB, EPA	Meeting	Caltrans hosted a cooperating/ participating agency meeting with the regulatory agencies to discuss project updates.
1/12/2015	CDFW	Phone	Caltrans biologist discussed with CDFW the need for pronghorn spotting surveys.
5/21/2015	CDFW	Phone	Caltrans biologist discussed survey results with CDFW.
5/28/2015	USFWS	Phone Conference	Caltrans and USFWS held a meeting with the Palm Springs office, more project details were presented and Ray Bransfield

Date	Agency Personnel Involved	Meeting Type	Comments
			became the USFWS staff assigned to the project until further notice.
6/16/2015	CDFW, USACE, EPA	Meeting	Agency coordination meeting hosted by Caltrans to discuss study findings and status.
3/9/2016	USFWS	Email	Caltrans biologist provided Ray Bransfield with survey updates and preliminary findings.
3/10/2016	USFWS	Email	Caltrans biologist provided Tara Callaway, per Ray Bransfield recommendation, on Bakersfield cactus survey results to confirm presence/absence of species adjacent to project limits.
6/1/2016	CDFW	Meeting	Meeting w/ CDFW personnel Betty Courtney, Erinn Wilson, and Dan Blankenship, to welcome Dan Blankenship to D7 projects. Dan Blankenship became the CDFW staff person assigned to the project until further notice. He was briefly updated on the project's survey results.
7/19/2016 **7/19/2016**	USFWS USACE	Email	Updated Ray Bransfield on a draft submittal date of October 2016 for our letter for written concurrence. Updated Crystal Huerta, the USACE staff person assigned to the project that we will submit for an approved JD in September 2016. She informed us that she is expected to be on maternity leave and that Stephanie Hall will be the point of contact at that time.
9/7/2016	CDFW	Site Visit	Mary Ngo and Paul Caron met with Dan Blankenship at within the project limits to discuss the

Date	Agency Personnel Involved	Meeting Type	Comments
			project, and to discuss potential avoidance, minimization and mitigation measures.
9/21/2016, 9/22/2016, 9/26/2016	UC Davis Tricolored Blackbird Portal	Email	Mary Ngo had an email exchange regarding tricolored blackbird nesting and foraging habitat within and adjacent to the project limits.
9/29/2016	CDFW	Email	Mary Ngo had an email exchange to discuss potential mitigation options for temporary noise impacts to nesting birds at Quail Lake. Recommended coordination with the West Valley County Water District and the LA County Fire Department to maintain suitable habitat for tricolored blackbirds at Holiday Lake with a controlled burn and with efforts to support sufficient water levels.
9/29/2016	West Valley County Water District	Email	Mary Ngo had an email exchange with Mark and he acknowledged that the West Valley County Water District is interested in a co-operative agreement to maintain suitable habitat for tricolored blackbirds at Holiday Lake with a controlled burn and with efforts to support sufficient water levels.
9/30/2016	USACE	Email	Mary Ngo coordinated to prepare for the approved JD submittal
10/3/2016	USFWS	Email	Mary Ngo contacted Tara Callaway and Tara asked to check back in with her on the genetic testing of Bakersfield cactus in the Tejon Hills adjacent to the project limits.
10/4/2016	Ian G. Gilliespie, Ph.D., Botany	Email and Phone Call	Tania Asef contacted Dr. Gilliespie to discuss information on

Date	Agency Personnel Involved	Meeting Type	Comments
			restoration of round leaved filaree (a rare plant) during a drought.
10/6/2016, 10/10/2016,	USFWS	Email	Mary Ngo informally consulted with Ray Bransfield and provided a draft letter our request for Section 7 written concurrence. He provided comments and requested edits on two drafts.
10/14/2016	USACE	Email	Mary Ngo was informed by Stephanie Hall that Veronica Li has been assigned to the project.
10/18/2016	USACE	Email and Approved JD package sent via US Mail	Mary Ngo sent Veronica Li an email package of the Approved JD digital files and sent a physical copy via US Mail.
10/18/2016	USACE	Email	Mary Ngo sent Ken Corey and carbon copied Brian Croft the Section 7 letter for our request for written concurrence.
11/7/16	USACE	Phone	Tania Asef left messages for both for a request of an update
11/8/16	USACE	Phone	Tania Asef spoke with Veronica who is the new liaison for this project regarding the status of concurrence for the Approved JD
11/9/16	USACE	Email	Tania Asef sent Approved JD package to Veronica Li
11/17/16	USFWS	Email	Tania Asef emailed regarding the status of concurrence, which should be received well before January 2017
11/22/16	USACE	Phone	Tana Asef spoke with Veronica to determine additional needs for USACE compliance

Date	Agency Personnel Involved	Meeting Type	Comments
12/15/16	USACE	Field Meeting	Tania Asef and Margaret Bornyasz of Ecorp Consulting met with Veronica to see PJD sites.

5.5.4 Air Quality Coordination

In December 2014, a PM Conformity Hot-Spot Analysis Project Summary Form (PM Form) was submitted for review by the interagency consultation. The interagency consultation is comprised of federal (EPA, FHWA, FTA), state (ARB, Caltrans), regional (AQMDs or APCD, SCAG), and sub-regional (County Transportation Commissions) agencies and other stakeholders. The project was reviewed and discussed in the December 2014 monthly meeting. The interagency consultation concurred in the meeting that the project would not be of air quality concern for PM2.5 and PM10.

Since the December 2014 meeting, the project changed its scope for some alternatives to include, among other features, acceleration and deceleration lanes to and from SR-138 at the interchange with I-5. The PM Form was revised to reflect the changed scope and submitted for review and discussion in a July 2015 monthly meeting. The interagency consultation reviewed and concurred that the project with changed scope would not be of air quality concern for PM2.5 and PM10.

An Air Quality Conformity Analysis was prepared and submitted to FHWA on January 2, 2017 to request project-level conformity determination. Caltrans is not allowed to approve the Final EIR/EIS without the determination by FHWA. Following their review, FHWA provided their project-level conformity determination for the project on February 14, 2017. Appendix L provides a copy of the project-level conformity determination by FHWA.

CHAPTER 6 | LIST OF PREPARERS

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CHAPTER 7 | DISTRIBUTION LIST

Notices of Availability of this Draft Environmental Impact Report/ Draft Environmental Impact Statement (DEIR/DEIS) have been sent to all property owners within a one and a half mile radius of the Build Alternatives (including the Antelope Acres Bypass option). In addition, notices have been sent to interested parties that have attended public meetings on the project or have requested to be added to a notification list for the project.

U.S. Army Corps of Engineers	U.S. Army Corp of Engineers Attn: Regulatory Division 915 Wilshire Blvd, Los Angeles, CA 90017-3401
U.S. Fish and Wildlife Service	Ventura Fish and Wildlife Office 2493 Portola Road, Suite B, Ventura, CA 93003
US Environmental Protection Agency	Region IX Environmental Review Office 75 Hawthorne Street, San Francisco, CA 94105
Advisory Council on Historic Preservation	Office of Federal Agency Programs Old Post Office Building 1100 Pennsylvania Avenue NW, Suite 809, Washington, DC 20004
Natural Resources Conservation Service	Lancaster Service Center 44811 Date Ave. Lancaster, CA 93534-3136
DOI National Parks Service	Pacific West Region 333 Bush Street, Suite 500 San Francisco, CA 94104-2828
USDA Forest Service	Region 5, Pacific Southwest Region 1323 Club Drive, Vallejo, CA 94592-1110
California Department of Fish and Wildlife	South Coast Region 3883 Ruffin Road San Diego, CA 92123
California Department of Conservation	Division of Land Resource Protection 801 K Street, MS 18-01 Sacramento, CA 95814

California Department of Water Resources	Delta and Statewide Water Management 1416 9th Street Sacramento, CA 95814
California Highway Patrol	2041 West Avenue "I" Lancaster 93536
Office of Historic Preservation California Department of Parks and Recreation	P.O. Box 942896 Sacramento, CA 94296
California Environmental Protection Agency	1001 I Street P.O. Box 2815 Sacramento, CA 95812-2815
Los Angeles Regional Water Quality Control Board	320 W. Fourth Street, Suite 200, Los Angeles, CA 90013
Lahontan Regional Water Board	14440 Civic Drive, Suite 200 Victorville, CA 92392
Southern California Association of Governments	818 West Seventh Street, 12th Floor Los Angeles, CA 90017
Native American Heritage Commission	1550 Harbor Blvd, Suite 100 West Sacramento, CA 95691
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County of Los Angeles, Fire Department	1320 North Eastern Ave. Los Angeles, CA 90063
County of Los Angeles, Public Works	900 S. Fremont Ave., Alhambra, CA 91803-1331

County of Los Angeles, Department of Parks and Recreation	Planning Division 510 South Vermont Avenue Los Angeles, CA 90020
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