State Route 178 Widening Project

Morning Drive to Miramonte Drive
Kern County, California
06-KER-178-PM R8.4/T9.8 and PM 8.2/10.4
Project ID 06-0000-0075

Initial Study with Proposed Mitigated Negative Declaration/ Environmental Assessment

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 the California Department of Transportation under its assumption of responsibility pursuant to 23 U.S. Code 327.

February 2012

General Information about this Document

What's in this document?

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration, has prepared this initial study/environmental assessment to examine the potential environmental impacts of the alternatives being considered for the proposed project in Kern County, California. The document describes why the project is being proposed; alternatives for the project; the existing environment that could be affected by the project; potential impacts from each of the alternatives; and the proposed avoidance, minimization, and/or mitigation measures.

What should you do?

- Please read this document. Additional copies of this document, as well as the technical studies, are available for review at the following locations: Caltrans District 6 Office, 1352 W. Olive Avenue, Fresno, CA 93778; Thomas Roads Improvement Program Office, 900 Truxtun Avenue, Suite 200, Bakersfield, CA 93301; Northeast Bakersfield Library, 3725 Columbus Street, Bakersfield, CA 93306; Beale Memorial Library, 701 Truxtun Avenue, Bakersfield, CA 93301; Baker Street Branch Library, 1400 Baker Street, Bakersfield, CA 93305. The document can also be accessed electronically at http://www.dot.ca.gov/dist6/environmental/envdocs/d6/.
- Attend the public information meeting or public hearing on _____.
- We welcome your comments. If you have any concerns regarding the proposed project, please attend the public information meeting or public hearing, or send your written comments to Caltrans by the deadline. Submit comments via U.S. mail to Caltrans at the following address:

  Bryan Apper, Senior Environmental Planner
  Southern Valley Environmental Analysis Branch
  California Department of Transportation, District 6
  855 M Street, Suite 200
  Fresno, California 93721

  Submit comments via email to: Bryan_Apper@dot.ca.gov.
- Submit comments by the deadline: _____.

What happens next?

After comments are received from the public and reviewing agencies, Caltrans, as assigned by the Federal Highway Administration, may 1) give environmental approval to the proposed project; 2) do additional environmental studies; or 3) abandon the project. If the project is given environmental approval and funding is appropriated, Caltrans could design and construct all or part of the project.

Printing this document: To save paper, this document has been set up for two-sided printing (to print the front and back of a page). Blank pages occur where needed throughout the document to maintain proper layout of the chapters and appendices.

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Bryan Apper, Southern Valley Environmental Analysis Branch, District 6, 855 M Street, Suite 200, Fresno, California 93721; (559) 445-6282 Voice, or use the California Relay Service TTY number, 1(800) 735-2929 or 711.

06-KER-178
PM R8.4/T9.8 and PM 8.2/10.4)
Project ID 0600000075

Widen State Route 178 from 0.68 mile east of Morning Drive (PM R8.4/T9.8) and 0.20 mile east of Miramonte Drive (PM 8.2/10.4)

INITIAL STUDY
with Proposed Mitigated Negative Declaration
ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 U.S. Code 4332(2)(C) and 23 U.S. Code 327 and 49 U.S. Code 303

THE STATE OF CALIFORNIA
Department of Transportation

2/24/12
Date of Approval

Jennifer H. Taylor
Office Chief, Central Region
Environmental Southern San Joaquin Valley
California Department of Transportation
NEPA Lead Agency

2/24/12
Date of Approval

Jennifer H. Taylor
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California Department of Transportation
CEQA Lead Agency

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Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) proposes to widen State Route 178 from two to six lanes from east of Morning Drive to Masterson Street and two to four lanes from Masterson Street to Miramonte Drive. Just east of Miramonte Drive, the roadway would transition back to the existing two-lane highway.

Determination

This proposed mitigated negative declaration is included to give notice to interested agencies and the public that it is Caltrans' intent to adopt a mitigated negative declaration for this project. This does not mean that Caltrans' decision regarding the project is final. This mitigated negative declaration is subject to modification based on comments received from interested agencies and the public.

Caltrans has prepared an initial study for this project and pending public review expects to determine from this study that the project would not have a significant effect on the environment for the following reasons: the proposed project would have no effect on agriculture and forest resources; geology/soils/seismicity/topography, mineral resources; floodplains; public services; traffic or transportation; population and housing; or environmental justice.

In addition, the proposed project would have no significant effect on cultural resources; visual/aesthetics; noise or vibration; hazardous waste; land use; community character and cohesion; air quality; hydrology or water quality; paleontological resources; recreation; and utilities and emergency services.

The proposed project would also have no significantly adverse effect on biology or paleontology because the following mitigation measures would reduce potential effects to a level of insignificance:

- Biological resource impacts would be mitigated by compliance with all permit provisions, conservation plans, or habitat programs.

_____ _____

Jennifer H. Taylor
Office Chief, Central Region
Environmental Southern San Joaquin Valley

Date

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List of Abbreviated Terms

dBA	A-Weighted Decibel
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
Traffic Noise Analysis Protocol	Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects (2006)
FHWA	Federal Highway Administration
NEPA	National Environmental Policy Act
PM	post mile
SAFETEA-LU	Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users
USFWS	United States Fish and Wildlife Service

Chapter 1 Proposed Project

1.1 Introduction

Caltrans proposes to widen existing State Route 178 in the northeast area of the city of Bakersfield from Morning Drive to Miramonte Drive. The project limits are from 0.68 mile east of Morning Drive to 0.20 mile east of Miramonte Drive (see Figure 1-1 and Figure 1-2). The California Department of Transportation (Caltrans) is the lead agency under both the National Environmental Policy Act (NEPA), as assigned by the Federal Highway Administration, and the California Environmental Quality Act (CEQA).

State Route 178 stretches from State Route 99 through the southern Sierra Nevada Mountains to State Route 14 southwest of Ridgecrest. Through the project area, State Route 178 is mostly a two-lane highway that widens to four lanes at some intersections to provide space for vehicles to turn. The highway connects rural and developing areas east of the city to downtown Bakersfield.

The proposed project is included in the 2011 Federal Statewide Transportation Improvement Program. It is also included in the Kern Council of Governments 2011 Final Regional Transportation Plan, the 2011 through 2015 Major Highway Improvements (Project Identification Number KER08RTP011), and the Kern Council of Governments 2011 Federal Transportation Improvement Program (Project Identification Number KER050108). The Kern Council of Governments updated the 2011 Regional Transportation Plan and approved Amendment No. 1 in May 2011. An update of the Federal Transportation Improvement Program (Amendment No. 4) was federally approved on June 2, 2011. The proposed project, as described under the Build Alternative, is included in the updated projects list.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of the proposed State Route 178 Widening Project is to increase traffic capacity and enhance mobility for future traffic demand in the area. The project meets the following objectives:

- Relieve traffic congestion and reduce traffic delay along State Route 178, particularly at these intersections: Masterson Street/State Route 184; Alfred Harrell Highway/Comanche Drive, and Miramonte Drive

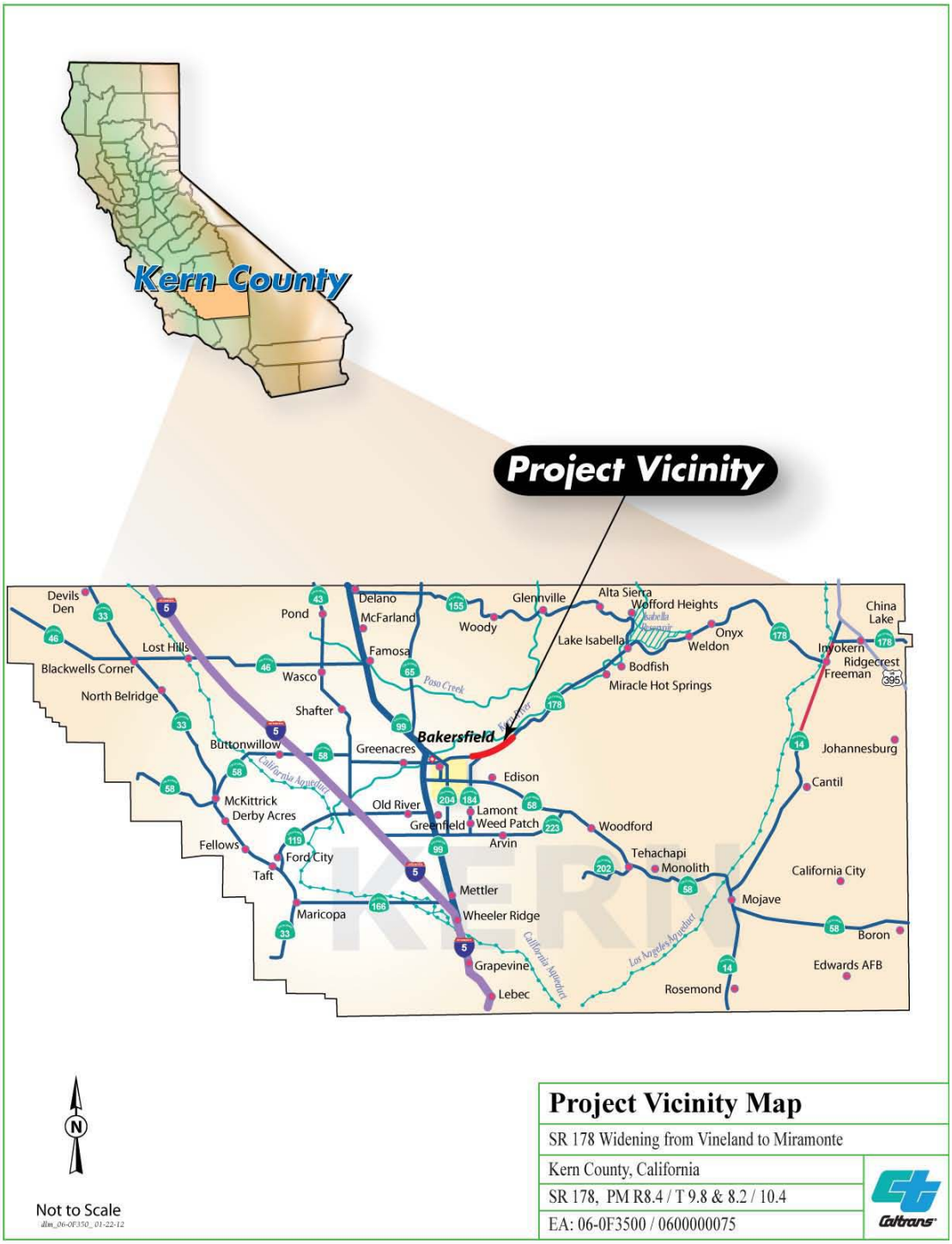


Figure 1-1 Project Vicinity Map

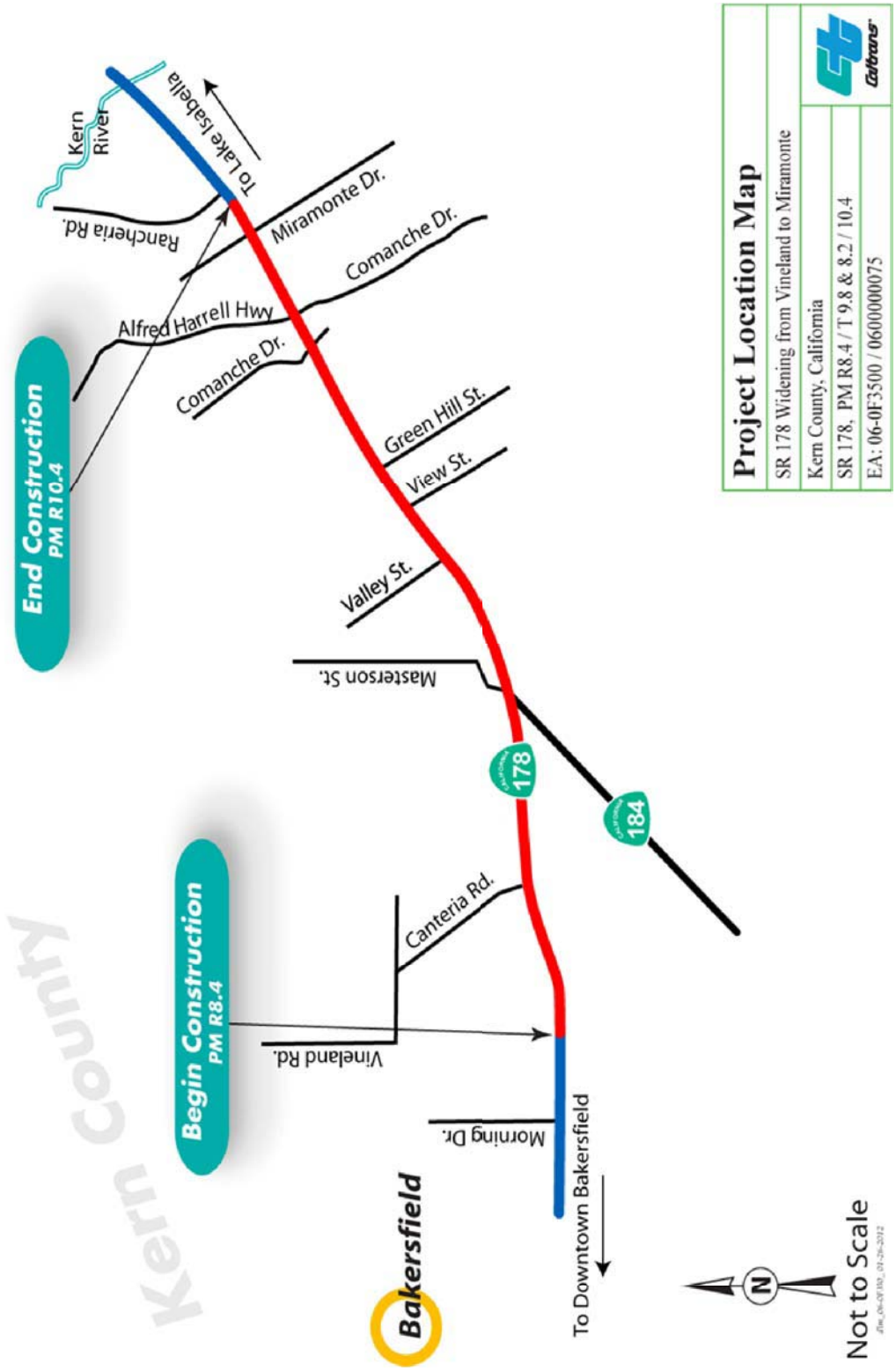


Figure 1-2 Project Location Map

- Provide efficient access along State Route 178 in the northeast area of the city of Bakersfield
- Route continuity: gradually widen State Route 178 in the urban area

1.2.2 Need

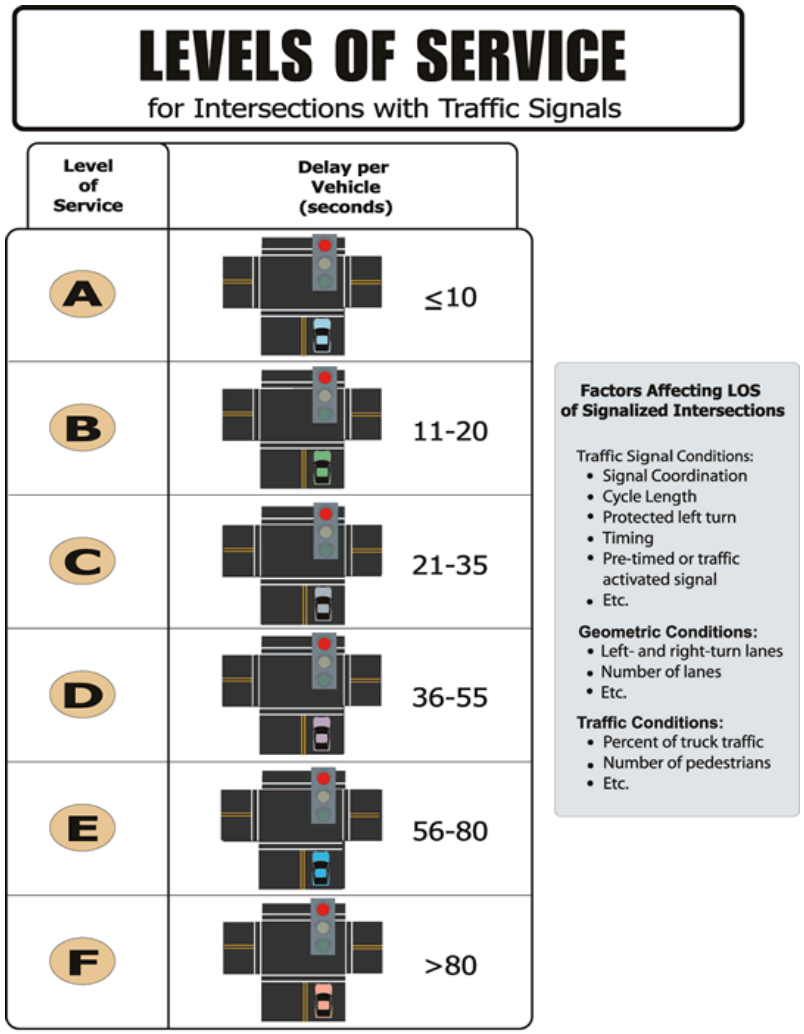
Current and predicted future growth in metropolitan Bakersfield and the surrounding areas being developed has created the need to relieve traffic congestion and improve circulation. Within the State Route 178 project limits, existing and forecasted traffic levels show the need for additional capacity and better circulation. The proposed project provides independent utility by connecting the planned Morning Drive interchange to the west (a proposed 4-lane facility) with the proposed State Route 178 widening project. It also provides logical termini by widening the portion of State Route 178 (Morning Drive to Miramonte Drive) that would experience substantial deterioration in level of service by 2035 without the proposed project. The following discussion summarizes the need for the proposed project based on existing and anticipated future system deficiencies in the State Route 178 project corridor.

1.2.2.1 Relieve Traffic Congestion and Reduce Traffic Delay

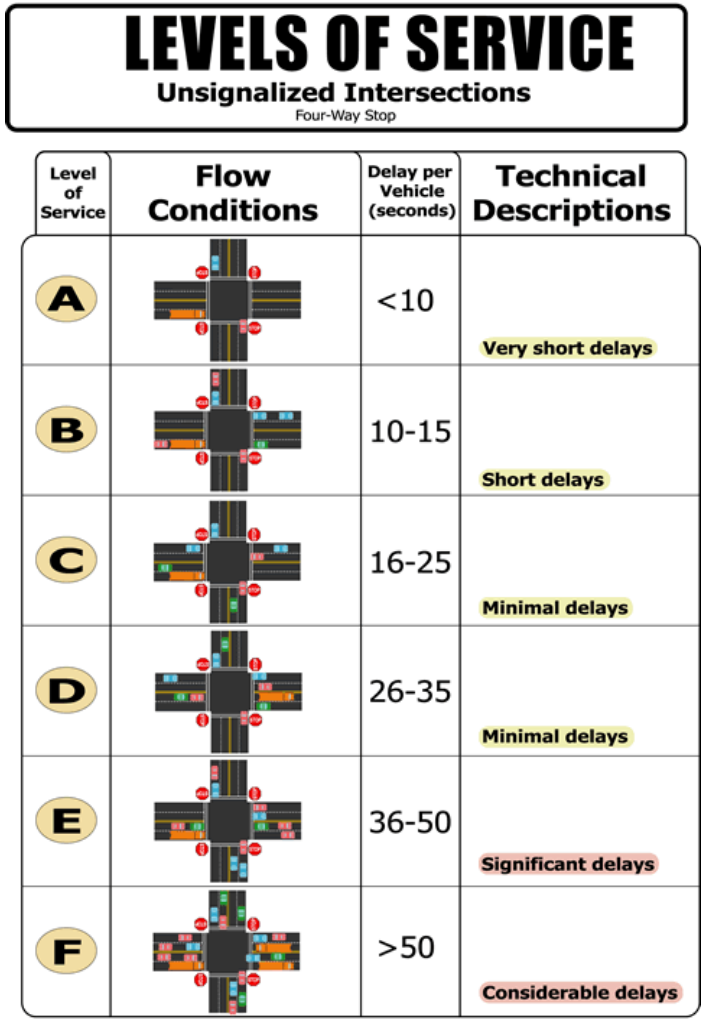
According to the California Department of Finance, Kern County's population is predicted to grow from 839,631 residents in 2010 to 1,352,627 residents in 2030. The City of Bakersfield, with a 2010 population of 347,483 residents, is by far the largest population center in the county. The City of Bakersfield has approved numerous large residential and commercial projects near State Route 178, including areas adjacent to the highway (see Table 2-1).

Due to Bakersfield's rapid growth, current traffic volumes are expected to substantially increase, resulting in unacceptable level-of-service delays for area motorists and visitors. Figure 1-3 provides the criteria for intersection levels of service, Table 1-1 summarizes existing and forecasted levels of service—without the proposed project—for State Route 178 intersections, within the project limits, for 2008 (existing conditions), 2015 (proposed opening year of the Build Alternative), and 2035 (design year for the Build Alternative).

As described in the *Traffic Report* (2011) and shown in Table 1-1, the anticipated growth in traffic—with the No-Build Alternative—would result in level of service F by 2035 during morning and evening peak traffic hours at all intersections, with the exception of State Route 178 and Park Palisades Drive. In addition, without the proposed project, several intersections along the proposed project alignment would, by 2015, operate at level of service E or worse during both the morning and evening peak traffic hours. Caltrans' goal for this type of roadway is LOS D.



Source: 2000 HCM, Exhibit 16-2, Level of Service Criteria for Signalized Intersections



Source: 2000 HCM, Exhibit 17-22, Level of Service Criteria for AWSC Intersections

Figure 1-3 Level of Service Criteria for Intersections

Table 1-1 Existing and Future Intersection Level of Service along State Route 178 within the Project Limits without the Project (No-Build)

Intersections	Existing (2008) Level of Service		Forecasted Year 2015 Level of Service		Forecasted Year 2035 Level of Service	
	Morning Peak	Evening Peak	Morning Peak	Evening Peak	Morning Peak	Evening Peak
State Route 178 and Canteria Drive/ Bedford Green	B	A	F	F	F	F
State Route 178 and State Route 184/ Masterson Street	F	E	F	F	F	F
State Route 178 and Masterson Street	—	—	F	E	F	F
State Route 178 and Valley Street	D	C	C	D	F	F
State Route 178 and View Street	C	C	D	E	F	F
State Route 178 and Green Hill Street	C	C	D	F	F	F
State Route 178 and Comanche Drive	C	C	E	F	F	F
State Route 178 and Alfred Harrell Highway	C	C	F	D	F	F
State Route 178 and Park Palisade Drive	A	A	A	B	B	B
State Route 178 and Miramonte Drive	B	B	C	D	F	F

Source: Traffic Report (2011)

1.2.2.2 Legislation

The Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU), signed into law on August 10, 2005, earmarked federal funding for local projects in the Bakersfield area. SAFETEA-LU Section 1302, National Corridor Infrastructure Improvement Program, identified federal funding for design, planning, and construction of State Route 178 in the city or BakersfieldAlternatives

This section describes the alternatives analyzed in this environmental assessment/initial study. The selection of an alternative will be based on how well each alternative is able to meet the project purpose and need. Impacts on the community and environment, as well as cost will also be considered.

1.2.3 Build Alternative

The Build Alternative includes widening State Route 178 from two to six lanes from 0.68 miles east of Morning Drive to Masterson Street and two to four lanes from Masterson Street to Miramonte Drive. Just east of Miramonte Drive, the roadway would transition back to the existing two-lane highway. Masterson Street, Alfred Harrell Highway, Miramonte Drive, and State Route 184 would be realigned or widened where they intersect with State Route 178. A new signal would be installed at the realigned Masterson Street intersection. The existing traffic control systems at Canteria Road, Alfred Harrell Highway, and Miramonte Drive intersections would be modified.

The Build Alternative would shift the proposed alignment of State Route 178 three feet south of the existing alignment between Canteria Road/Bedford Green Drive and Masterson Street. This alignment shift allows the widening of the highway to a six-lane section while minimizing the impacts to the existing utility easement along the north side of the highway. The southern curb, gutter, and sidewalk would be reconstructed 18 feet south of their existing location. A 1,000-foot-long retaining wall would be built on the south side of the highway to reduce the impacts to Mesa Marin Park. The proposed alignment rejoins the existing alignment east of Masterson Street.

Slivers (purchase of small portions of a parcel that allow the existing use to remain) would be taken from parcels.These sliver takes would total 52.4 acres of right-of-way. No full acquisitions of parcels would be required. These sliver or partial takes are mostly required for slope grading. The total estimated cost for right-of-way is about $11.4 million. The construction cost is $30.4 million. The total project capital cost is about $41.8 million.

In addition, new travel-lane improvements under the Build Alternative are as follows:

- Existing Canteria Road intersection would align with Bedford Green Drive, a new street, on the south.
- State Route 184 would be realigned to the west where it intersects with State Route 178, a right-in and right-out turning movement from State Route 184. The new intersection would also provide a left-turn storage lane for traffic on westbound State Route 178 to southbound State Route 184.
- Masterson Street would be realigned to the east of its current location. The realignment would provide a right-angle intersection with State Route 178 and allow traffic movement to and from State Route 178. The new intersection would also provide a left-turn pocket from eastbound State Route 178 to northbound Masterson Street. A new signalized intersection would be built at Masterson Street.
- Signals at Canteria Road/Bedford Green Drive, Alfred Harrell Highway/Comanche Drive and Miramonte Drive would be modified.
- At intersections with dedicated right-turn lanes, a 4-foot-wide bicycle lane would be painted onto the roadway between the through lanes and the right-turn lane. The outside shoulder adjacent to the bike lanes would be 4 feet wide, except for an 8-foot-wide shoulder at Miramonte Drive.
- Curbed raised medians would be constructed between intersections.
- Public and private road intersections and the existing driveways would be modified in accordance with the Highway Design Manual. To enhance the safety and traffic operation

of the highway in this area, only right-in and right-out traffic movements would be allowed at the intersections with Valley Street, View Street, Green Hill Street, Old Comanche Drive, Park Palisades Drive, and private driveways.

Typical cross-sections (number of lanes and lane width) for the Build Alternative are shown in Figure 1-4.

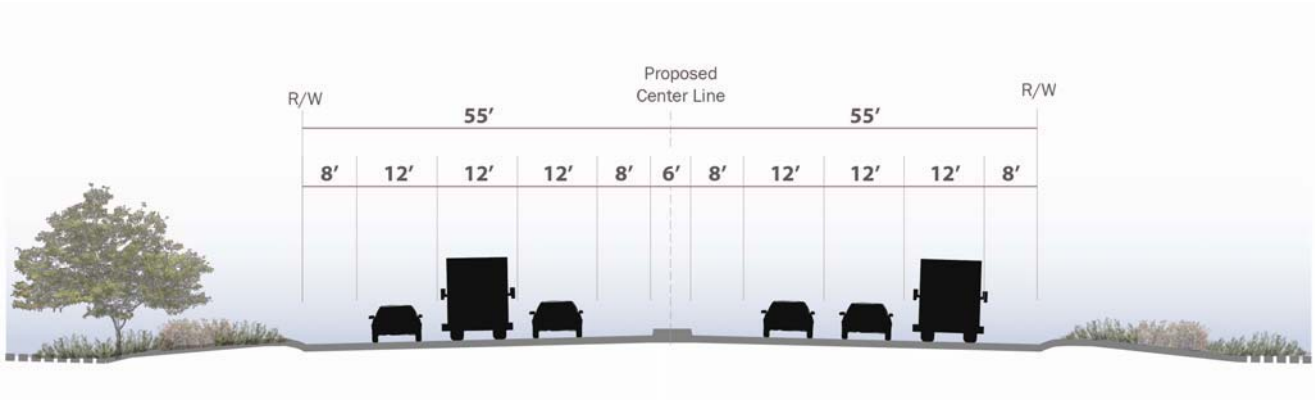
The majority of the construction activities would occur during daytime hours, although portions of the improvements such as street realignment and intersections) would occur at night. No detours are expected to be necessary. Construction is anticipated to take about 24 months to complete. State Route 178 would be open through all stages of construction.

1.2.4 No-Build Alternative

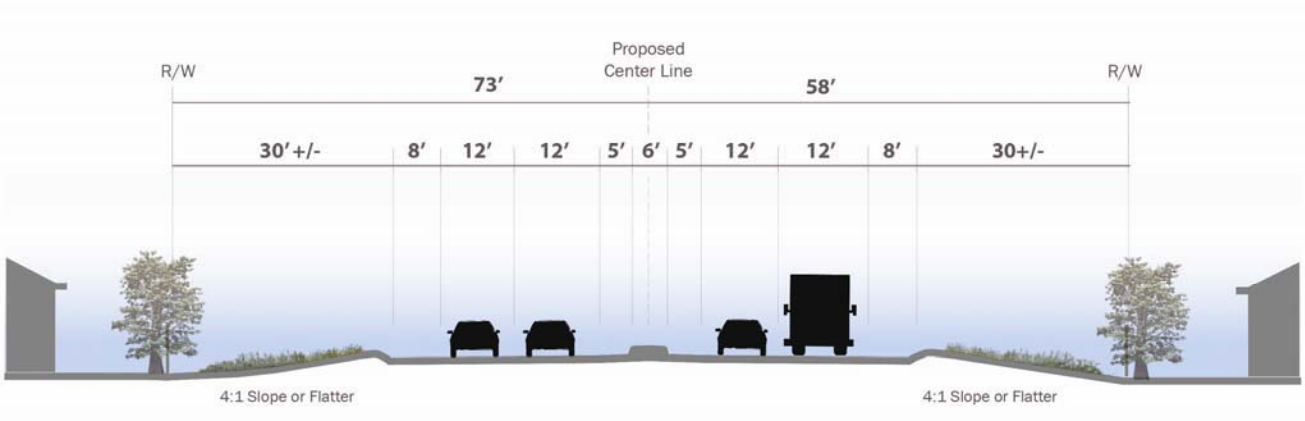
Under the No-Build Alternative, the widening of State Route 178 would not occur, and the highway would remain a two- and four-lane facility within the project limits. The purpose of describing and analyzing the No-Build Alternative is to allow decision-makers the opportunity to compare and consider the impacts of doing nothing versus implementing the Build Alternative (proposed project). The No-Build Alternative does not meet the purpose and need of the project, which is to relieve traffic congestion and provide efficient access by improving circulation through added capacity.

1.2.5 Comparision of Alternatives

Caltrans will use the following criteria for evaluating the project alternatives: how well each alternative meets the purpose and need, costs, and environmental impacts. Table 1-2 provides a comparison of the project alternatives.



Proposed six lane street section



Proposed four lane street section standard

Figure 1-4 Typical Cross Sectons for Build Alternative

Table 1-2 Comparison of Alternatives

Criteria	Build Alternative	No-Build Alternative
Relieves traffic congestion through 2035	Level of service F at one intersection	Level of service F at nine intersections
Provides efficient access along State Route 178	Yes	No
Is consistent with legislation (SAFETEA-LU)	Yes	No
Right-of-way acquisition	52.4 acres	0 acres
Sliver acquisition from Mesa Marin Sports Complex	Yes	No
Would require relocation of the 30-inch Mojave Gas Line	No	No
Noise	Yes. Under NEPA, noise levels would approach or exceed 67 dBA; however, per Caltrans standards, noise abatement is not reasonable. Less than significant impact under CEQA for the following reasons: a 5-7 dBA increase would occur over a 25-year timeframe; only affect 12 percent of residences in the project area; only occur during morning and evening peak-hour commutes; and the project setting is not uniquely sensitive to increased noise levels.	No
Natural Communities	Coastal valley/freshwater marsh—0.05 acre Valley saltbush scrub—0.36 acre	No
Wetlands and Other Waters	Wetland—0.05 acre Regional Water Quality Control Board Waters—0.05 acre California Department of Fish and Game state streambeds—0.05 acre	No
Plant Species	No	No
Animal Species	Burrowing owl habitat—79.58 acres Loggerhead shrike—45.43 acres White-tailed kite and golden eagle habitat—45.07 acres Increased vehicle strikes Construction impacts to burrowing owl Pre-construction surveys Worker awareness program Participation in Metropolitan Bakersfield Habitat Conservation Plan	No

Criteria	Build Alternative	No-Build Alternative
Threatened and Endangered Species	Potential construction impacts to blunt-nosed leopard lizard San Joaquin kit fox habitat—79.58 acres Participation in Metropolitan Bakersfield Habitat Conservation Plan Focused pre-construction surveys Worker awareness program Biological Monitoring Permeable Fencing Retention of existing culverts, where feasible, if culverts are modified (extended or replaced). Culverts should be designed to increase the openness index to provide kit fox movement opportunities	No
Invasive Species	Yes Cleaning and covering construction equipment Hydroseeding bare ground	No
Paleontology	Yes Areas of high paleontological sensitivity exist below five feet. The proposed detention basins would be excavated to a maximum depth of 10 feet. Paleontological Monitoring and Implementation of Monitoring Plan	No
Cost (millions of dollars)	$41.8	$0

After the public circulation period, all comments would be considered, and Caltrans would select a preferred alternative and make the final determination of the proposed project's effect on the environment. In accordance with the California Environmental Quality Act, if no significant adverse impacts are identified, Caltrans would prepare a Negative Declaration or Mitigated Negative Declaration. Similarly, if Caltrans determines the action does not substantially impact the environment, Caltrans, as assigned by the Federal Highway Administration, will issue a Finding of No Significant Impact in accordance with the National Environmental Policy Act.

1.2.6 Alternatives Considered but Eliminated from Further Discussion

1.2.6.1 Two-Phase Alternative

The *Project Study Report* (2009) considered a two-phased project about 4.01 miles in length with Phase 1 widening of State Route 178 to four lanes for the entire project length. Phase 2

would build a new interchange and improvements at Vineland Road and widen State Route 178 to six lanes from about Rancheria Road to Alfred Harrell Highway. Under Phase 2, the Canteria Road intersection would also be removed and traffic would be directed to the new Vineland Road interchange. three alignment alternatives were considered between View Street and Alfred Harrell Highway to address impacts to the right-of-way.

The two-phased project was eliminated from further consideration as a result of two issues: 1) funding for Phase 2 is not currently available within the Regional Transportation Planning horizon of 40 years; 2) funding is not identified, therefore an Air Quality Conformity Determination cannot be obtained from the Federal Highway Administration. Without a realistic timeframe for developing Phase 2, it became apparent that a supplemental environmental document and, potentially, additional environmental studies would be needed at a later date.

Based on these issues, the original project and associated alignment alternatives were eliminated from further study and a Supplemental Project Study Report was prepared to address the changes from the original Project Study Report. The Supplemental Project Study Report (2011) proposes a single-phased project (with allocated funding) that eliminates the Vineland Road interchange and reduces the project limits to a length of about 3.5 miles. The single-phased project or Build Alternative being evaluated in this environmental document combines features from both phases of the earlier project to help achieve the required 20-year design life. The single-phased project is consistent with the changes reflected in the Kern Council of Governments 2011 Regional Transportation Plan.

1.2.6.2 Northern Alignment Alternative

A northern alignment, which shifted State Route 178 fifteen feet to the north between Canteria Drive and Masterson Street was considered in order to avoid impacts to the City of Bakersfield’s sports facility (Mesa Marin Sports Complex). This alternative allowed the widening of the highway to a six lane section while maintaining the existing southern curb line and sidewalk, eliminating impacts to the the Mesa Marin Sports Complex. The northern shift would rejoin the existing aligment east of Masterson Street. Sliver takes (purchase of small portions of a parcel that allow the existing use to remain) totaling about 51.3 acres would have been required for this alternative. The sliver takes were mostly required for slope grading.

The northern shift, however, placed the roadway right-of-way within four feet of an existing underground 30-inch natural gas transmission pipeline (a high-risk utility). The gas pipeline is located north of State Route 178 and runs parallel to the highway from Canteria Drive to east of Masterson Street where it then crosses over State Route 178 to head southeast. From Canteria Drive to just east of the Maria Bonita Mexican restaurant the pipeline is about 65

feet north of the existing State Route 178 right of way. From the Maria Bonita Restaurant to Masterson Street the pipeline shifts slightly north and is about 150 feet from the existing right of way. A 200-foot-long retaining wall along the roadway was proposed to reduce impacts to the pipeline. Although the retaining wall helps reduce impacts to the pipeline, the roadway right-of-way still encroaches on the pipeline easement. Encroachment onto the easement would cause issues for access and maintenance of the pipeline by the owner.

Due to the pipeline location and the issues related to maintenance and access, the proposed Northern Alignment Alternative was eliminated from further study.

1.2.6.3 Transportation System Management and Transportation Demand Management Alternatives

Transportation system management and transportation demand management strategies were also considered for this proposed project. Transportation system management strategies are actions that increase the efficiency of existing roads by increasing the number of vehicle trips a highway can carry without increasing the number of through lanes. Examples of transportation system management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination.

Transportation demand management strategies focus on regional strategies for reducing the number of vehicle trips and vehicle miles traveled as well as increasing vehicle occupancy. The strategies help with higher vehicle occupancy or reducing traffic congestion by expanding the traveler's transportation choices in terms of travel method, travel time, travel route, travel costs, and the quality and convenience of the travel experience. Examples of transportation demand management strategies include ride sharing, flexible work hours (flextime), increased transit usage, walking, and bicycling.

Transportation system management or transportation demand management alternatives were eliminated from further consideration as these strategies and associated measures alone would not satisfy the purpose and need of the proposed project. They would not provide sufficient increases in the efficiency or capacity of the State Route 178, would not be able to provide acceptable traffic levels of service, and would not meet the majority of the project purposes. The following transportation system management and transportation demand management measures, however, have been incorporated into the Build Alternative for this proposed project:

- Traffic signal timing to improve roadway capacity (signal optimization).
- Four-foot-wide shoulder lanes from Comanche Drive to Miramonte Drive within the existing right-of-way. These new shoulder lanes may be used for bicycle access.

- Relocation of an existing and operational changeable message sign currently about 550 feet west of Masterson Street. The sign would be moved to the same general vicinity to State Route 178.

1.3 Permits and Approvals Needed

Table 1-3 lists the permits, reviews, and approvals required for construction of the proposed project (Build Alternative).

Table 1-3 Permits and Approvals Needed for Build Alternative

Agency	Permit/Approval	Action/Status
U.S. Army Corps of Engineers	Clean Water Act, Section 404—Permit for filling or dredging waters of the U.S.	Will be submitted after the final environmental document.
U.S. Fish and Wildlife Service	Endangered Species Act Section 7 Consultation for federally listed Threatened and Endangered Species	A Biological Assessment evaluating the project's potential effects to federally listed Threatened and Endangered species has been prepared and will be submitted to the U.S. Fish and Wildlife Service after public circulation of the draft environmental document. Section 7 Consultation is currently in progress.
California Department of Fish and Game	California Fish and Game Code, Section 1602 Streambed Alteration Agreement	Will be submitted after the final environmental document.
Central Valley Regional Water Quality Control Board (Region 5)	Clean Water Act, Section 401—Water Quality Certification	Permit to be obtained prior to construction
	Water Discharge Permit; National Pollutant Discharge Elimination System Coordination.	Compliance with (1) the Statewide Storm Water Permit and Waste Discharge Requirements for the State of California (Order Number 99-06-DWQ, NPDES No. CAS000003) and (2) the General Permit, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity (Order No. 99-08-DWQ, NPDES No. CAS000002).
San Joaquin Valley Air Pollution Control District	Dust Control Permit and Approved Air Impact Assessment per Rule 9510, Indirect Source Review	Coordination at a staff level has occurred as part of preparation of the Air Quality Study Report. The permit will be acquired after project approval and before construction.
	Rule 8210, Limits to fugitive particulate matter emissions during construction activities.	Coordination at a staff level has occurred as part of preparation of the Air Quality Study Report. The permit will be acquired after project approval and before construction.

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the proposed project would have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the proposed project, potential impacts from each of the alternatives, and proposed avoidance, minimization, and/or mitigation measures. Any indirect impacts are included in the general impacts analysis and discussions that follow.

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

- **Farmlands/Timberlands**—There is no prime or unique farmland, farmland of statewide importance or timberland in the project area, based on the California Department of Conservation's Farmland Mapping and Monitoring Program and Kern County maps (accessed November 2011). In addition, there are no known affected parcels under Williamson Act contract.
- **Geology/Soils/Seismicity/Topography**—The stable soil type, lack of groundwater, and generally flat topography in the area limits risks associated with liquefaction and landslides. Based on geotechnical studies conducted for the project, the level of potential ground rupture from seismic activity is not expected to exceed minor roadway cracks.
- **Mineral Resources**—There are no known mineral resources within the project area, based on a review of the Metropolitan Bakersfield General Plan's Conservation Element and Land Use Policy Concept Map.

2.1 Human Environment

2.1.1 Land Use

2.1.1.1 Existing and Future Land Use

Affected Environment

The proposed project is in the northeastern area of the city of Bakersfield south of the Kern River. A small portion of the project study area between Alfred Harrell Highway and Valley Street is within unincorporated Kern County. Northeast Bakersfield, less urbanized than

downtown Bakersfield, has developed lands consisting of residential subdivisions. Undeveloped lands with a few residential subdivisions comprises most of the area east of Fairfax Drive. The small number of residential developments in northeast Bakersfield indicates a lower resident population, although planned development in the future would change the present population characteristics. Land uses within the project corridor are residential subdivisions, open space, and cleared land for development as well as the Rio Bravo Country Club and the Hacienda Reservoir at Miramonte Drive.

The Metropolitan Bakersfield General Plan Land Use Map (2002) shows the following land uses in the project area: Low Density Residential; Medium Density Residential; High Density Residential; General Commercial; Office Commercial; Mixed Use Commercial; Mineral Resources; Public Facilities including Public Schools; and Open Space (see Figure 2-1). Unincorporated areas are immediately west of Alfred Harrell Highway and are designated by the County of Kern General Plan (2007) as rural residential and estate residential.

Development adjacent to the project corridor includes a fuel station, sports park (Mesa Marin Sports Complex), restaurant, public storage facility, golf course (Rio Bravo Country Club)and single-family residences. The fuel station is southwest of the State Route 178 and State Route 184 intersection and the public storage facility is at the southeast corner of the same intersection. The sports park is south of the Canteria Drive and State Route 178 intersection. The golf course is south of State Route 178 and is accessible via Miramonte Drive.

Planned developments within the project study area include single-family and multi-family residential subdivisions, mixed-use residential/commercial developments, and open space uses. Table 2-1 and Figure 2-2 present proposed developments in the project vicinity (City of Bakersfield Cumulative Projects Map, October 21, 2010). Within the Metropolitan Bakersfield General Plan planning period (2030), northeast Bakersfield anticipates substantial growth. The Metropolitan Bakersfield General Plan estimates that predicted population increases in the Bakersfield area would result in the need for about 37,000 housing units. Infrastructure (sewer, water, utilities) necessary for urbanization is anticipated to be completed early in the planning period.

In recent years, the Bakersfield area has experienced increased population growth due to housing affordability and proximity to Los Angeles County. In response to this growth, residential and commercial development has occurred in different parts of the Bakersfield area. Numerous developments are planned for northeast Bakersfield in response to urban growth. According to the Growth Inducement Analysis prepared by Parsons (January 2009), forecasted jobs and houses are predicted to increase through 2035 in northeast Bakersfield.

The area southwest of the State Route 178 and State Route 184 intersection is predicted to see 9,879 new jobs. The area north and northeast of the State Route 178 and State Route 184 intersection is expected to experience a residential total population growth of 30,510 from 2006 to 2035. The expansion of employment centers and housing would increase future trips on State Route 178 in northeast Bakersfield.

Although development trends in northeast Bakersfield are designated for a more urbanized setting than exists today, the current economic crisis has affected the regional and local real estate markets and slowed construction and development projects. However, once the economy improves, development trends in northeast Bakersfield are anticipated to resume their pre-recession levels. The Bakersfield General Plan is undergoing an update (estimated completion is 2012/2013) and envisions village-like centers and additional residential developments in the northeast community.

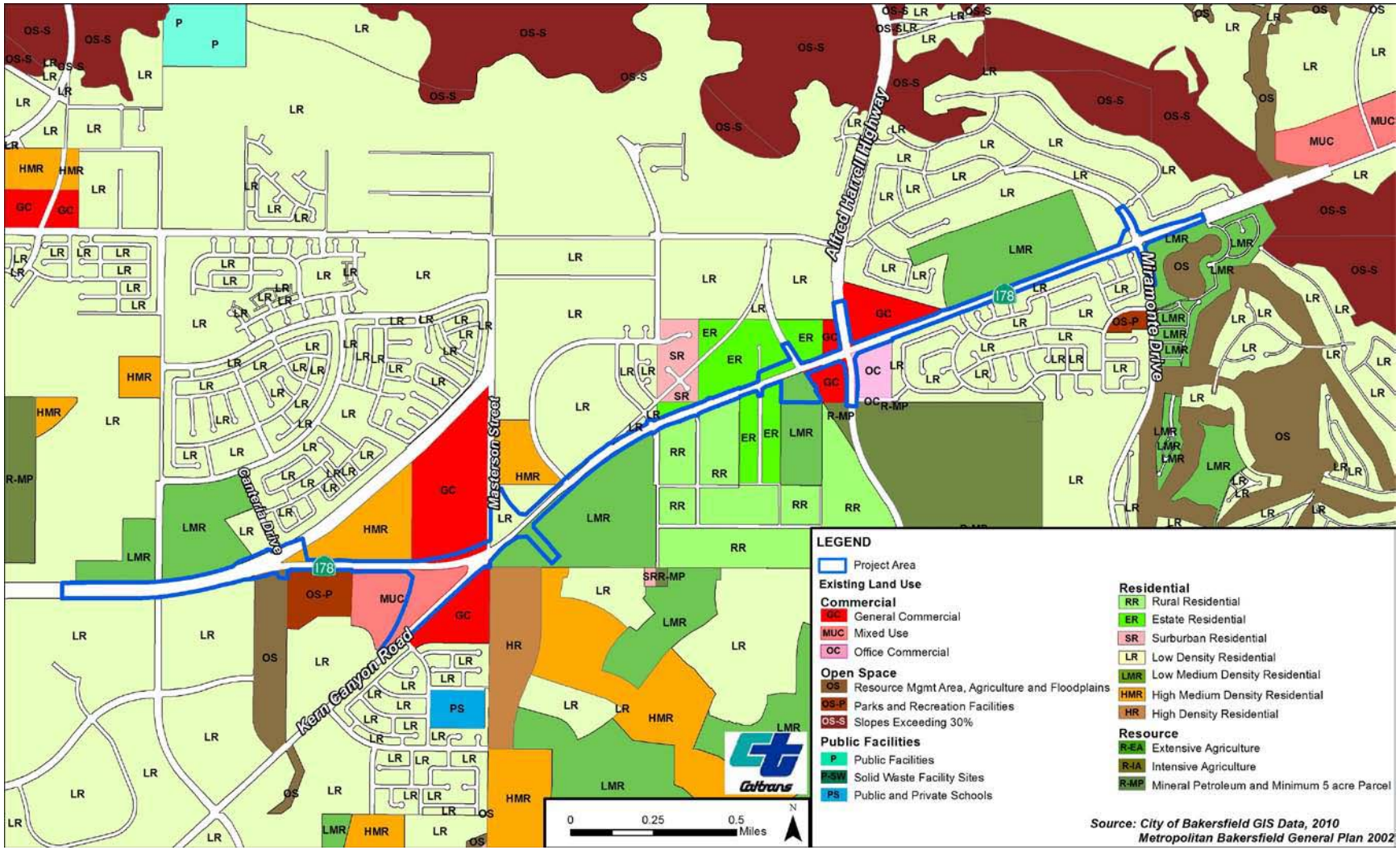


Figure 2-1 Land Use Map

Table 2-1 Proposed Development Projects and Land Uses in the Project Area

Project Name	Proposed Use	Status	Reference Number in Figure 2-2
Roadway and Interchange Improvements			
State Route 178 at Morning Drive Interchange	Construct a new interchange near existing State Route 178/Morning Drive intersection; convert an existing two-lane roadway with passing lanes to a four-lane freeway; and realign Morning Drive.	Construction expected to begin by early 2013.	2
Mixed-Use Development (includes residential, commercial and recreational land uses)			
The Canyons T6299	• 1,000 lots on 462 acres • 214 lots on 47 acres • 120 multi-family dwelling units on 28 acres • 65,000 sq ft of general commercial on 8 acres • Private recreational center on 5 acres • 3 proposed parks totaling 17 acres	Approved	3
Rio Bravo Ranch	• 4,688 lots • 20 acres of general commercial • 43 acres of mixed use commercial • 739 acres reserved for the development of landscaped trails, parks, and open space areas	Approved	4
Residential			
Sky 19	658 homes on 161 acres	Approved	5
Sky 21 and Sky 29	6,000 homes on 1,280 acres	Active Tentative Tract Map with no recorded phases.	6
Eagle Meadows	483 single family lots and 6 lots for open space on 156 acres	Approved	7
Riverview	3,181 homes with a school/park, green belt corridors, and a trail system	Approved	8
T6961	High-medium density residential on 158 acres	Active Tentative Tract Map with no recorded phases.	9
T6964	Low density residential on 192 acres	Active Tentative Tract Map with no recorded phases.	10
T6444	Low density residential on 84 acres	Active with recorded phases.	11
T6638	Low density residential on 85 acres	Active Tentative Tract Map with no recorded phases.	12
T6485R	Low medium density residential on 20 acres	Active Tentative Tract Map with no recorded phases.	13
T6182R	Low density residential on 105 acres	Active Tentative Tract Map with no recorded phases.	14
T6866	Low density residential on 84 acres	Active Tentative Tract Map with no recorded phases.	15
T6736R	Low medium density residential on 19 acres	Active Tentative Tract Map with no recorded phases.	16

Table 2-1 Proposed Development Projects and Land Uses in the Project Area (continued)

Project Name	Proposed Use	Status	Reference Number in Figure 2-2
T6433	Resource management area—agricultural and floodplains on 7 acres	Active Tentative Tract Map with no recorded phases.	17
Recreational			
Mesa Marin Sports Complex	Park totaling 40 acres	Phase 1—completed Phase 2—pending Phase 3—pending	18

Source: http://www.bakersfieldcity.us/cityservices/devsrv/development_maps/index.htm

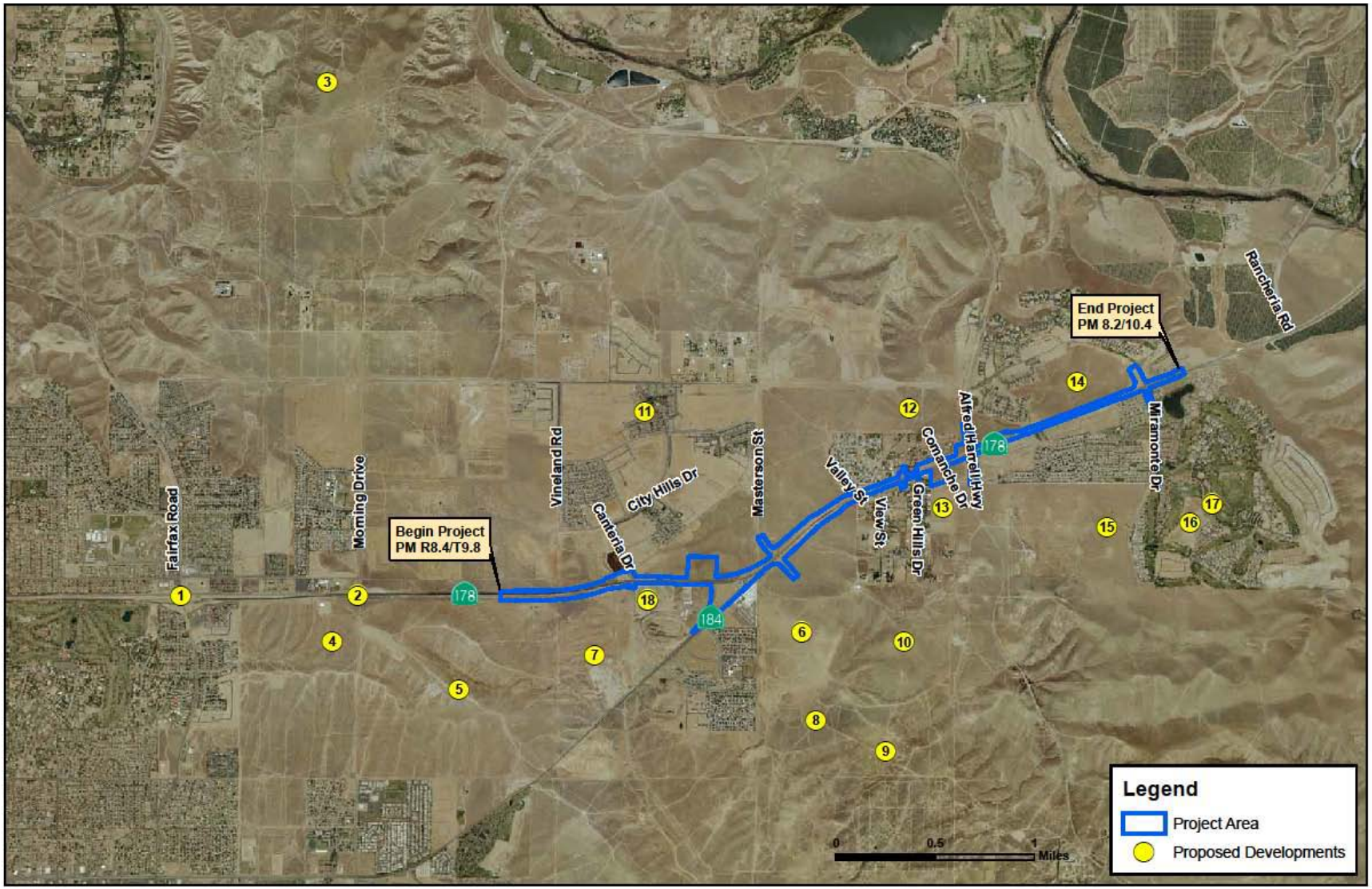


Figure 2-2 Location of Proposed Developments

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in changes to existing or general plan land use designations. The No-Build Alternative would not result in impacts related to land use.

Build Alternative

The Build Alternative would require the acquisition of 52.4 acres to widen State Route 178 and build the proposed improvements. Mostly undeveloped parcels zoned for residential or commercial uses and land immediately adjacent to the right-of-way comprise the proposed sliver takes. In addition no residential or business relocations would be required. Building the proposed project would benefit the community with improved existing and future traffic operations and provide access from State Route 178 to adjacent current and planned developments. Land use designations identified in the Metropolitan Bakersfield General Plan would not change. In addition, it should be noted that the proposed project would not physically divide an established community. State Route 178 is an existing highway and land use compatibility has been considered as part of Kern County and City of Bakersfield project approvals. Based upon the analysis above, the Build Alternative would not impact land use.

Construction Impacts

No temporary residential or business relocations would be required during construction. Full access control is proposed along State Route 178 from the western project limit to the current Canteria Road intersection. Currently no existing land uses within this segment of the proposed project would be affected by access control.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required.

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

Affected Environment

Kern Council of Governments 2011 Final Regional Transportation Plan and Federal Transportation Improvement Program

The Kern Council of Governments 2011 Final Regional Transportation Plan, adopted in July 2010, examines current and future transportation plans, population and housing growth, and land use data for the public agencies in the Kern Council of Governments region to assist in developing projections through 2030.

The proposed project is fully funded and is included in the Kern Council of Governments 2011 Final Regional Transportation Plan (July 2010) as project ID number KER08RTP010. Construction would begin 2011 to 2015. The project is also included in the Kern Council of Governments 2011 Federal Transportation Improvement Program (December 14, 2010, page 24, project KER050108). State Route 178 within the project limits is designated as a principal arterial, as a regionally significant system in the 2011 Final Regional Transportation Plan, and as a state highway terminal access route for large trucks under the Surface Transportation Assistance Act. The Kern Council of Governments updated the 2011 Regional Transportation Plan in May 2011 by regionally approving Amendment No. 1. Federal approval of the Federal Transportation Improvement Program Amendment No. 4 was obtained on June 2, 2011. The proposed project, as currently described, is included in the updated list of projects.

Metropolitan Bakersfield General Plan and Kern County General Plan

The Metropolitan Bakersfield General Plan prepared by the City of Bakersfield and Kern County was adopted by the Bakersfield City Council on December 11, 2002 and became effective on February 26, 2003 (Resolution Number 222-02). The Metropolitan Bakersfield General Plan incorporates information and findings generated during the 2001 General Plan Update. The planning horizon for the Metropolitan Bakersfield General Plan is 2020.

The general plan is a policy document designed to give long range guidance to those making decisions that affect the character of the metropolitan Bakersfield planning area. The plan represents the official statement of the community's physical development and its economic, social, and environmental goals. The 408-square-mile Metropolitan Bakersfield General Plan coincides with the Metropolitan Bakersfield Priority Area of the Kern County General Plan.

The Kern County General Plan (Kern County Planning Department, adopted March 13, 2007—County General Plan) defers to the circulation and land use elements of the Metropolitan Bakersfield General Plan regarding goals, policies, and implementation strategies that affect transportation and land use within the Metropolitan Bakersfield Planning area. Roads within the Metropolitan Bakersfield General Plan planning area should have the same alignment as the Kern County General Plan grid system. In the Metropolitan Bakersfield General Plan, State Route 178, within the project limits, is a freeway.

There are no goals in the Land Use Element of the Metropolitan Bakersfield General Plan that considers highway improvements. Goals contained in the Land Use Element are more reflective of policies designed to regulate new land use developments.

Metropolitan Bakersfield Habitat Conservation Plan

The Metropolitan Bakersfield Habitat Conservation Plan addresses the effects of urban growth on federal and state protected plant and animal species within the Metropolitan Bakersfield General Plan area. The Metropolitan Bakersfield Habitat Conservation Plan is a joint program between the City of Bakersfield, Kern County, California Department of Fish and Game, and United States Fish and Wildlife Service that was undertaken to assist urban development applicants and local roadway projects in complying with state and federal endangered species laws. The Metropolitan Bakersfield Habitat Conservation Plan uses a mitigation fee paid by applicants for grading or building permits to fund the purchase and maintenance of suitable habitat to offset impacts to endangered species habitat. The proposed project is within the boundaries of the Metropolitan Bakersfield Habitat Conservation Plan.

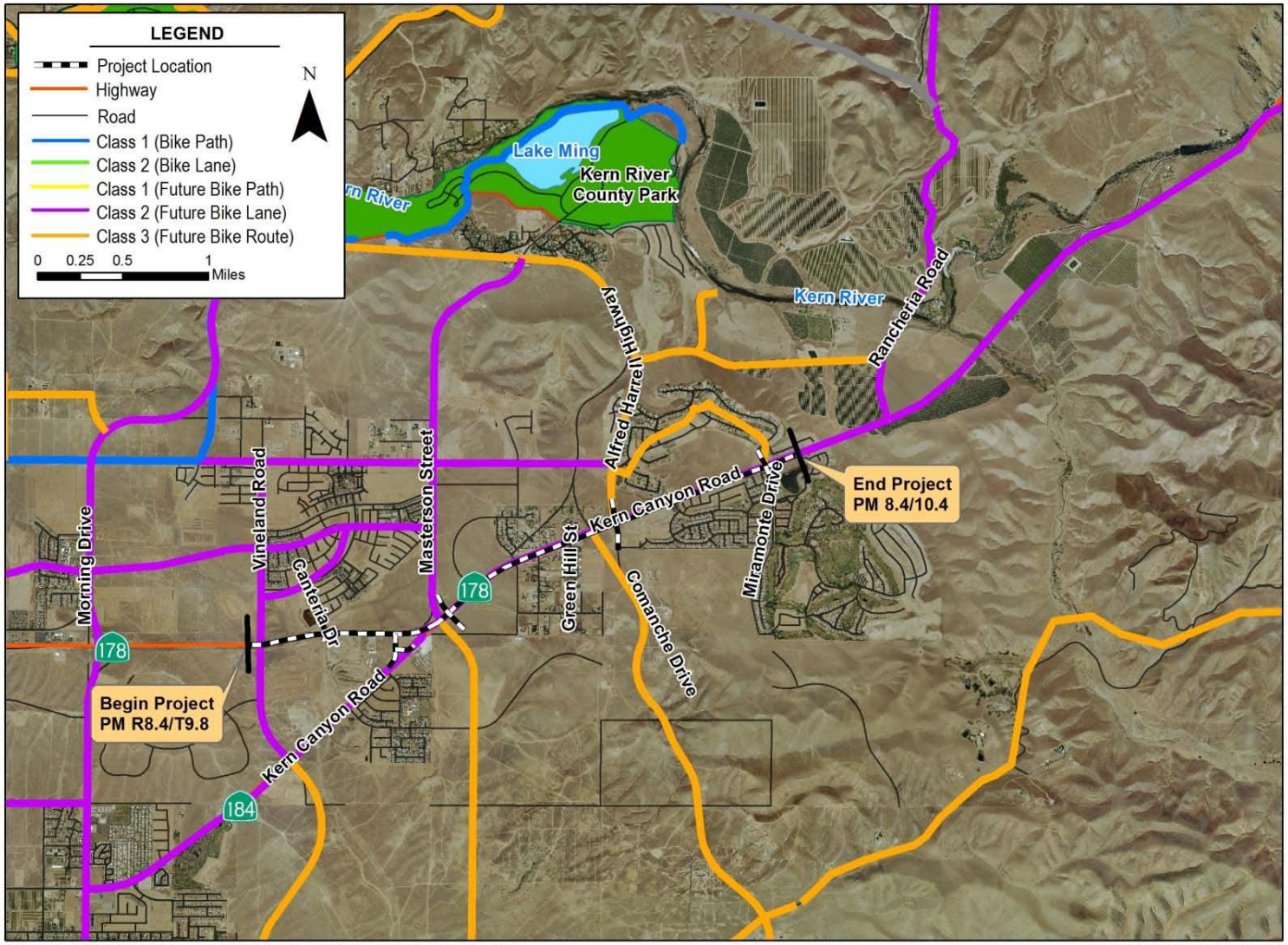
The Metropolitan Bakersfield Habitat Conservation Plan Trust Group agreed on December 3, 2010 to allow the City of Bakersfield to use the Metropolitan Bakersfield Habitat Conservation Plan for compensatory mitigation required by U.S. Fish and Wildlife Service.

City of Bakersfield Recreation and Parks Master Plan (2007)

The objectives of the Recreation and Parks Master Plan is to identify and plan for current and future park facilities and the needs of the community as they relate to park use and enjoyment. The master plan suggests policies and guidelines for managing limited park resources.

Metropolitan Bakersfield Bikeway Master Plan

The Metropolitan Bakersfield Bikeway Master Plan identifies existing and future bikeway routes and paths within the city of Bakersfield (see Figure 2-3). Both Class II and Class III bike routes are shown within the project limits. The Circulation Element of the City of Bakersfild General Plan contains specific goals and policies for bikeways within the city. Within the project study area is a Class II bicycle route along State Route 178 from Kern Canyon Road/Masterson Street eastward to the city limits and a Class III bicycle route along Alfred Harrell Highway. Currently there is enough shoulder area to provide for bicycle travel; however, the shoulders are not signed or striped as bike lanes. Marked shoulder lanes north and south of State Route 178 within the project corridor do accommodate bicycle travel.



Source: City of Bakersfield Existing and Proposed Bikeway Paths
(GIS data last updated January 2007)

SR-178 Widening Project
Existing and Proposed Bikeway Paths

Figure 2-3 Existing and Proposed Bikeway Paths

Specific Parks and Trails Plan for Northeast Bakersfield

This specific plan provides for a system of parks and interconnecting trail systems in northeast Bakersfield for public enjoyment of the local open space and recreational amenities. The proposed project is within the area addressed in this plan but does not contain designated or proposed trails.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current configuration of State Route 178 would be maintained and no widening of the facility would occur. State Route 178 would remain a two- and four-lane facility within the project limits. Although the facility would continue to be maintained by Caltrans, it would not be upgraded to promote future development, an important goal of the Kern Council of Governments 2001 Final Regional Transportation Plan. As noted in Table 2-2, however, this alternative would be consistent with other applicable local and state planning documents.

Build Alternative

As shown in Table 2-2, the Build Alternative is cited in several state, regional, and local planning documents and is consistent with the goals, policies, and land use designations of those documents. Since the proposed project does not conflict with any of these plans or associated policies, there are no environmental consequences anticipated under the Build Alternative. Based on the analysis above, the Build Alternative would not cause impacts and would be consistent with local, regional or state plans.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required.

Table 2-2 Consistency with State, Regional, and Local Plans and Programs

Plan	No-Build Alternative	Build Alternative
Kern COG 2011 Final Regional Transportation Plan	**Not Consistent** The No-Build Alternative does not meet policies of the transportation plan that includes upgrades and funding to maintain the current highway and the promotion of future development.	**Consistent.** The Build Alternative is fully funded and included in the Final Regional Transportation Plan (May 2011) and Federal Transportation Improvement Program (June 2011).
Metropolitan Bakersfield General Plan	**Consistent** The No-Build Alternative is consistent with the freeway route designation contained in the General Plan. No goals in the Land Use Element of the general plan consider highway improvements.	**Consistent.** The Build Alternative is consistent with the freeway route designation contained in the General Plan. There are no goals in the Land Use Element that consider highway improvements.
Metropolitan Bakersfield Habitat Conservation Plan	**Consistent.** The No-Build Alternative would not affect the provisions of this planning document as there would be no proposed roadway development and, therefore, no effects on habitat.	**Consistent.** The Build Alternative is consistent with the provisions of this planning document as the Metropolitan Bakersfield Habitat Conservation Plan would be used for compensatory mitigation as required by the U.S. Fish and Wildlife Service.
City of Bakersfield Recreation and Parks Master Plan	**Consistent.** The No-Build Alternative would not affect existing park and recreational facilities nor does it propose development that would affect these resources.	**Consistent.** The Build Alternative would not preclude the development or improvement of existing or future park and recreational facilities.
Metropolitan Bakersfield Bikeway Master Plan	**Consistent.** Although the No-Build Alternative would not improve bicycle facilities, it does not preclude the future construction of proposed facilities.	**Consistent.** The Build Alternative would include 8-foot-wide shoulders to accommodate cyclists and dedicated (striped) Class II bike lanes at intersections. The proposed improvements would not conflict with the City of Bakersfield Bikeway Master Plan.
Specific Parks and Trails Plan for Northeast Bakersfield	**Consistent.** The No-Build Alternative would not preclude future construction of proposed facilities or affect existing facilities.	**Consistent.** Implementation of the project would not affect the goals and objectives of this plan and existing designated bike lanes would remain.

2.1.1.3 Parks and Recreational Facilities

Affected Environment

Two public park and recreation areas are in the project area. The Mesa Marin Sports Complex is in the area of the former Mesa Marin Raceway adjacent to State Route 178. Phase 1 construction of the Mesa Marin Sports Complex is complete. The park is currently open for local adult softball leagues. According to the City of Bakersfield Recreation and Parks Master Plan (2007) and the City of Bakersfield's Recreation and Parks website, Solera Gardens Park is a neighborhood/local park and city park and amenity (http://www.bakersfieldcity.us/recreation/Parks/ParkMapComp/bestlmap.htm).

The park is near the gated Solera community south of State Route 178 along Miramonte Drive. Solera Gardens Park is within the project study area but is outside of the project corridor. Both parks are considered a Section 4(f) resource under the Department of Transportation Act of 1966 since they are publicly-owned public parks. Publicly-owned public parks are one of the resources protected by the provisions of Section 4(f).

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening of the facility would occur. It would remain a two- and four-lane facility within the project limits. As such, the No-Build Alternative would not result in impacts to parks and recreational uses in the project area because there would be no improvements to State Route 178.

Build Alternative

Build Alternative would have a direct affect on the Mesa Marin Sports Complex since it would require acquisition of parkland due to a necessary shift to the south in the proposed project improvements, affecting about 14,600 square feet (0.33 acre) of the park. The affected area would run parallel to State Route 178 and about 1,000 feet from the Canteria Drive and State Route 178 intersection east of the park boundary. The affected area includes a sidewalk, undeveloped land, and the landscaped area outside of the softball fields, the primary recreational feature of the park.

Construction Impacts

Construction activities for the proposed project would temporarily affect parks and recreational activities at Mesa Marin Sports Complex by introducing a new source of noise, dust, and visual intrusion from construction traffic and activities (see section 2.1.5).

Avoidance, Minimization, and/or Mitigation Measures

Impacts to the Mesa Marin Sports Complex associated with Build Alternative would require the following minimization measures:

- **PR-1**—Purchase and install four electronic scoreboards
- **PR-2**—Replace all trees, shrubs, and grass removed as part of the highway project
- **PR-3**—Relocate the baseball monument at the entrance to a place outside the proposed right-of-way
- **PR-4**—Install decorative retaining walls along the State Route 178 widening project and the baseball park

- **PR-5**—Reconstruct all sidewalk and fencing removed as part of the highway project
- **PR-6**—Install higher fences or add to fence netting to protect motorists from errant softballs
- **PR-7**—Relocate the main irrigation supply at the northeast side of the park
- **PR-8**—Maintain access to State Route 178 in accordance with the State Route 178 Access Management Plan between Canteria Road/Bedford Green Drive and Miramonte Drive

Section 4(f) De Minimis Findings

Regulatory Setting

Section 6009(a) of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended Section 4(f) legislation at 23 United States Code 138 and 49 United States Code 303 to simplify the processing and approval of projects that have only *de minimis* impacts on lands protected by Section 4(f).

The Federal Highway Administration's final rule on Section 4(f) *de minimis* findings is codified in 23 Code of Federal Regulations 774.3 and 23 Code of Federal Regulations 774.17.

In the first substantive revision to Section 4(f) since its enactment, SAFETEA-LU amended the law to simplify the processing and approval of projects that have only *de minimis* impacts on lands protected by Section 4(f). This revision provides that once the U.S. Department of Transportation determines that a transportation use of Section 4(f) property, after consideration of any impact avoidance, minimization, and mitigation or enhancement measures, results in a *de minimis* impact on that property, an analysis of avoidance alternatives is not required and the Section 4(f) evaluation process is complete. Responsibility for compliance with Section 4(f) have been assigned to Caltrans pursuant to the memoranda of understanding under SAFETEA-LU Sections 6004 and 6005, including determinations and approval of Section 4(f) evaluations as well as coordination with those agencies that have jurisdiction over a Section 4(f) resource that may be affected by a project action.

Potential Use of the 4(f) Property

The Mesa Marin Sports Complex at 11000 Kern Canyon Road is the only municipal park adjacent to State Route 178 within the project study area (Figure 2-4). The Mesa Marin Sports Complex is owned by the City of Bakersfield and is designated as open space—Parks and Recreation on the Metropolitan Bakersfield General Plan Land Use Map. It is under the jurisdiction of the City of Bakersfield Department of Recreation and Parks. The Mesa Marin

Sports Complex is proposed to be completed in three phases. The 15-acre first-phase of the sports complex was opened on June 1, 2011 and includes new lighted softball fields, a concession and restroom building, and a parking lot. The fields are used for Amateur Softball Association adult softball league games and tournaments. The softball fields are currently an important regional recreational resource for the City of Bakersfield. Phase 2 includes plans for a playground, splash pad, and skate park on 5 acres of the park and Phase 3 includes a soccer complex on the remaining 20 acres of the park. The funding and construction date for Phase 2 and Phase 3 has not yet been determined.

As shown in Figure 2-5, the Build Alternative would require shifting the roadway alignment south between Canteria Drive/Bedford Green Drive and Masterson Street. The alignment shift in this location would affect the Mesa Marin Sports Park, a Section 4(f) resource. The southern alignment shift proposed under the Build Alternative would require a sliver acquisition of about 14,600 square feet (0.33 acre) of land from the 40-acre sports complex.

Why the Use is De Minimis

The proposed area to be acquired includes, currently, vacant and undeveloped land and landscaped areas outside of the softball fields, the primary recreational feature of the park. The area of direct impact would not affect any of the essential features or attributes of the Mesa Marin Sports Complex. The Build Alternative would not adversely affect the softball fields, concession and restroom building, access and parking, or planned future phases.

Public Notice Process

The public notice published in the Bakersfield Californian on [add date], 2012 announced the availability of this document and the date, location, and time of the public hearing.

Figure 2-4 Mesa Marin Sports Complex Overview

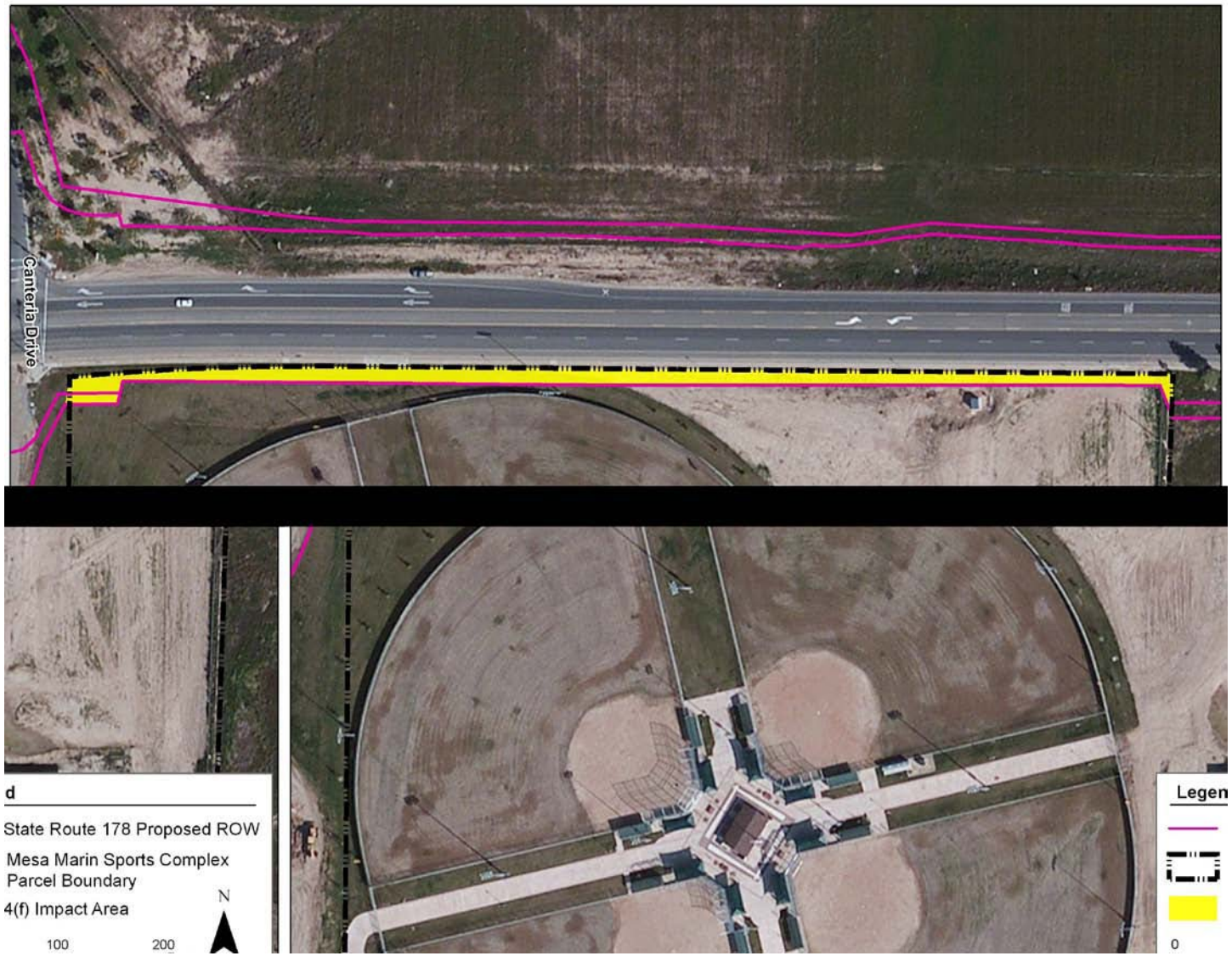


Figure 2-5 Use of Mesa Marin Sports Complex

Avoidance, Mitigation, and/or Enhancement Measures

- **PR-1**—Purchase and install four electronic scoreboards
- **PR-2**—Replace all trees, shrubs, and grass removed as part of the highway project
- **PR-3**—Relocate the entrance baseball monument outside of the proposed right of way
- **PR-4**—Install decorative retaining walls along the State Route 178 widening project and the baseball park
- **PR-5**—Reconstruct all sidewalk and fencing removed as part of the highway project
- **PR-6**—Install higher or add fence netting to protect motorists from errant softballs
- **PR-7**—Relocate the main irrigation supply at the northeast side of the park
- **PR-8**—Maintain access to State Route 178 from the future parking lot on the east side of the softball fields in accordance with the State Route Access Management Plan between Canteria Road/Bedford Green Drive and Miramonte Drive.

Because the project would not adversely affect the important recreational activities, attributes, and essential features of the park and because the mitigation/enhancement measures listed above would be included as part of the project, Caltrans requested that the City of Bakersfield concur with a Section 4(f) *de minimis* finding for the Build Alternative. The City of Bakersfield concurred on January 20, 2012. Copies of the Caltrans request and city response is found in Appendix E.

2.1.2 Growth

2.1.2.1 Regulatory Setting

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

The California Environmental Quality Act also requires the analysis of a project's potential to induce growth. California Environmental Quality Act 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…."

2.1.2.2 Affected Environment

Current Urban Development Patterns in the Project Study Area

The project area is currently developed residential and commercial land surrounded by undeveloped land. Based on review of proposed development project information provided by the City of Bakersfield, there are about 3,334 acres and over 6,385 residential lots (primarily single-family residential) associated with planned and approved development within and surrounding the project area (see Table 2-1 and Figure 2-2).

Future Growth Potential in the Project Study Area

According to the California Department of Finance, Kern County's population is predicted to grow from 839,631 residents in 2010 to 1,352,627 residents in 2030. The city of Bakersfield, with a 2010 population of 347,483 residents, is by far the largest population center in the county. Northeast Bakersfield is less urbanized than the rest of the Bakersfield area. Most of the area east of Fairfax Drive is undeveloped lands with a few residential subdivisions. The small number of residential developments in northeast Bakersfield indicates a lower resident population, although planned development in the future would change the present population characteristics. Table 2-3 shows the future growth potential for Kern County, the city of Bakersfield, and the project study area.

Table 2-3 Future Growth Potential

Population	Year 2000[1]	Year 2010[2]	Year 2030[3]
Kern County	661,645	839,631	1,352,627
City of Bakersfield	247,057	347,483	n/a

Sources:
[1]*United States Bureau of the Census, Census 2000.*
[2]*State of California, Department of Finance, E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2010 Benchmark. Sacramento, California, September 2011.*
[3]*State of California, Department of Finance, P1 Population Projections by Race/Ethnicity for California and Its Counties 2000-2050.*

n/a=not available
Note: The population estimates provided by the California Department of Finance (Years 2010 and 2030) are derived from the U.S. Census 2010 data.

Environmental Consequences

No-Build Alternative

Although the No-Build Alternative does not propose the construction of land uses that could result in substantial growth, such as residential and commercial developments, the proposed project study area is in an area anticipated to undergo rapid urbanization. Both the Metropolitan Bakersfield General Plan and Kern Council of Governments 2001 Final Regional Transportation Plan have been developed to address projected growth within this and other portions of Bakersfield and to ensure the timely and orderly development of needed

infrastructure. The No-Build Alternative would reduce the ability of the existing and planned local and regional roadway/highway network to effectively and efficiently handle traffic levels and would result in decreased roadway speeds and increased trip duration in the future. As such, the No-Build Alternative would conflict with applicable growth-related plans and policies intended to ensure that the effectiveness and performance of these roadways is maintained. It would also conflict with applicable congestion management programs, including level of service standards.

Build Alternative

The Build Alternative would widen State Route 178 and provide needed roadway improvements to alleviate traffic congestion from future growth in the project corridor and from the surrounding areas. Moreover, because of increasing migration into the metropolitan Bakersfield area due to the region's available affordable housing and employment base, it should be noted that growth would continue to occur in the absence of the proposed project. Reasonably foreseeable growth would occur within the project area since city-approved tract development has been planned in the immediate area.

Changes to Accessibility

The area already has state highway access, and the proposed project would not add any additional intersections that would open access to areas that do not currently have access. However, the proposed project would improve existing access within the project corridor by improving circulation by adding capacity.

Growth Pressures

Development along State Route 178 in northeast Bakersfield has been proceeding regardless of improvements to State Route 178; therefore, the rate of growth may not be substantially increased with building the proposed project. Widening State Route 178 would help accommodate future growth. In the near term, level of service on the existing highway would not affect planned growth or the housing market in northeast Bakersfield. However, by 2035, nine out of 10 major intersections within the project corridor would experience level of service F. Of course this degraded level of service would not occur unless the surrounding area has already developed according to adopted plans.

As discussed in section 2.1.1.2, the Build Alternative is consistent with local and regional growth-related plans and projections and would accommodate forcasted traffic in the Metropolitan Bakersfield General Plan and Kern Council of Governments' Regional Transportation Plan. Building the project would help handle planned growth by providing adequate and necessary transportation improvements.

The project would not cause any major access changes to the northeast Bakersfield area, nor would it substantially accelerate growth which is already planned. The project would provide just enough of an increase in highway capacity to support the growth planned for the project area, in accordance with good planning principles. The Bakersfield General Plan has already directed anticipated growth to areas that would protect resources and minimize environmental impacts. Therefore, putting the Build Alternative in place would not result in adverse impacts to growth.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required.

2.1.3 Community Impacts

2.1.3.1 Community Character and Cohesion

Regulatory Setting

The National Environmental Policy Act 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 4331[b][2]). The Federal Highway Administration in its implementation of the National Environmental Policy Act (23 USC 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under the California Environmental Quality Act, 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

Community Character and Access

The proposed project is in northeast Bakersfield. Land uses in the study area are mostly open space with some scattered residential single-family subdivisions and some commercial uses. Residential subdivisions in the project area are in the city of Bakersfield's Hills neighborhood northeast of Canteria Drive; the Panorama Heights neighborhood near Comanche Drive; and the Rio Bravo Country Club neighborhood near Miramonte Drive. Because the subdivisions are scattered and divided by substantially undeveloped land, these

subdivisions function like individual neighborhoods. Along the study area, commercial uses include a fuel station, restaurant, and a public storage facility. Park and recreation facilities include Mesa Marin Sports Complex, a private golf course, and the Solera Gardens Community Park. The remainder of the project study area is primarily rural undeveloped land. Primary access to the study area is State Route 178, a major east-to-west highway that connects downtown Bakersfield to the southern Sierra Nevada Mountains, including Lake Isabella and the Sequoia National Forest.

Development Trends and Demographics

Up until recent times, subdivision development in northeast Bakersfield was constrained by topography and limited public water and sewer services. In the last two decades, however, the study area has undergone rapid urbanization through the conversion of undeveloped land to residential single-family subdivisions. The majority of the developed portion adjacent to the project corridor (between Fairfax Road and Comanche Drive) is encompassed in Census Tract 9.10, Block Groups 1 and 3, and Census Tract 10, Block Group 1. Between 1990 and 2000, the population of this area increased over 40 percent, from 5,227 to 7,494. By April 2010, the census reported the population of this same area had increased an additional 10 percent to 8,233. Moreover, substantial residential development is proposed in northeast Bakersfield in the coming decades.

Demographic data from the 2010 decennial census for the project area was investigated for Census Tract 9.10, Block Groups 1, 3, and 4; Census Tract 10, Block Group 1; and Census Tract 51.04, Block Groups 1 and 2. Note, these 2010 census geographic areas are numbered somewhat differently than mentioned in the paragraph above, but the geographic area is comparable, though somewhat larger. Due to small sample sizes and suppression of the data in this urbanizing area, block groups were used because they are the smallest geographic area providing data that would otherwise be missed at the census block level.

In 2010, the total population in the project area encompassing the entire project corridor was 11,307. The racial composition of the population is largely White (68 percent) with no other race alone comprising more than 5 percent of the population. About 20 percent of the population is either some other race alone or a mixture of two or more races. An estimated 35 percent of the population is Hispanic of any race. Table 2-4 shows the population by race and Hispanic ethnicity for the project study area, the city of Bakersfield, and Kern County. In comparison, the study area is substantially less racially diverse and less Hispanic than the population of either the city of Bakersfield or Kern County.

Table 2-4 2010 Race and Ethnicity Composition

Race/Ethnicity	Project Study Area		City of Bakersfield		Kern County	
Race						
White/Caucasian	7,640	68%	197,349	57%	499,766	60%
Black or African American	578	5%	28,368	8%	48,921	6%
American Indian and Alaska Native	170	2%	5,102	1%	13,676	2%
Asian	597	5%	21,432	6%	34,846	4%
Native Hawaiian and Other Pacific Islander	24	0%	478	0%	1,252	0%
Other Race Alone	1,706	15%	77,686	22%	204,314	24%
Two or More Races	592	5%	17,068	5%	37,856	5%
Totals	11,307	100%	347,483	100%	839,631	100%
Hispanic Ethnicity						
Hispanic[1]	3,924	35%	158,205	46%	413,033	49%
Non-Hispanic	7,383	65%	189,278	54%	426,598	51%
Total	11,307	100%	347,483	100%	839,631	100%

Source: United States Bureau of the Census, Census 2010.

[1]Hispanic persons can be of any race. The number listed is an aggregate number for all races.
Totals may not equal 100% due to rounding.

Table 2-5 shows the household characteristics for the project study area, the city of Bakersfield, and Kern County. The project study area can be described as typical of young communities in suburban areas. Almost 60 percent of the households are husband-wife families. About 20 percent are individuals living alone and about 17 percent are families headed by single individuals, as well as two-parent families with and without children. A full 20 percent of the population is estimated to be individuals living alone. An estimated 2.7 persons reside in households, and the median household income is about $53,700.

There is a high proportion of elderly residents, which may reflect either older residents on rural residential properties or, potentially, retirees in the new subdivisions. In comparison, the study area has a substantially higher rate of elderly persons than the city of Bakersfield and Kern County, but a substantially lower level of poverty. The household characteristics are nearly the same as those for the city of Bakersfield and Kern County. Moreover, the median household income is higher than the median household income for residents of both the city and Kern County.

Table 2-5 2010 Household Characteristics

	Project Study Area		City of Bakersfield		Kern County	
Total Population	11,307	100%	347,483	100%	839,631	100%
Elderly	1,409	12%	29,336	8%	75,437	9%
Poverty[1]	2,300	13%	53,500	18%	151,300	20%
Households	4,195	n/a	111,132	n/a	254,610	n/a
Living Alone	832	20%	21,800	20%	49,209	19%
Husband/Wife	2,463	59%	57,276	52%	132,726	52%
Other Families	696	17%	25,878	23%	59,013	23%
Non-Families	204	5%	6,178	6%	13,662	5%
Average Persons per Household	2.70	n/a	3.13	n/a	3.30	n/a
Median Household Income[2]	$53,700	n/a	$51,900	n/a	$46,300	n/a

Sources: United States Bureau of the Census, Census 2010; United States Bureau of the Census, 2005-2009 American Community Survey.

[1]Poverty data is no longer collected through the decennial census. As such, data from the 2005–2009 American Community Survey is provided. This data is an average of the poverty rate for the 5-year period, 2005–2009. The data is provided for the Census Tracts 9.10, 10, and 51.04. This geographic area is somewhat larger than the study area defined by block groups, but the additional area is largely undeveloped. Note: the percent of the population living in poverty is based on the number of persons for which poverty status was determined, not the total population. Data has been rounded.
[2]The data for median household income was obtained from the 2005–2009 American Community Survey for Census Tracts 9.10, 10, and 51.04. Data has been rounded.
n/a = not applicable.
Totals may not equal 100% due to rounding.

Table 2-6 provides information regarding housing characteristics for the project area, the city of Bakersfield, and Kern County in the year 2010. The project study area includes about 4 percent of the city's total housing stock. In April 2010, an estimated 89 percent of the housing was with 68 percent owner-occupied and 32 percent renter-occupied. Dwelling units that were vacant, but not for sale or rent, compose about 2 percent of the total housing stock. In comparison, both the city and the county had slightly higher home occupancy rates, though a somewhat smaller proportion of owner-occupied dwellings.

The median home value based on the five-year average from the 2005–2009 American Community Survey was about $252,500 for the three census tract areas along the project corridor. The median value of homes in the city was just slightly higher than in northeast Bakersfield, but both were substantially higher than the median home value of $226,800 in the county.

Table 2-6 2010 Housing Characteristics

Dwellings	Project Study Area		City of Bakersfield		Kern County	
Total Dwellings	4,707	n/a	120,725	n/a	284,367	n/a
Occupied	4,195	89%	111,132	92%	254,610	90%
Owner-Occupied	2,873	68%	66,323	60%	152,828	60%
Renter-Occupied	1,322	32%	44,809	40%	101,782	40%
Vacant[1]	93	2%	1993	2%	7304	3%
Medium Home Value[2]	$252,500	n/a	$263,700	n/a	$226,800	n/a

Sources: United States Bureau of the Census, Census 2010; United States Bureau of the Census, 2005-2009 American Community Survey.

[1]Vacant housing excludes unoccupied housing that is for rent, rented but unoccupied, for sale, sold but not occupied, and occasional or seasonal use.
[2]The data for median home value was obtained from the 2005–2009 American Community Survey for Census Tracts 9.10, 10, and 51.04.
n/a = not applicable.
Totals may not equal 100% due to rounding.

Interaction

Because much of the land in the project study area remains undeveloped at this time, interaction between residents is minimal outside of immediate neighbors. Northeast Bakersfield has very few public or community facilities. As described in Section 2.1, there are no shopping centers, commercial districts, schools, community centers, fire or police stations, or religious institutions within the immediate area and as such, residents must travel to these locations. There are two parks and a golf course that provide opportunities for residents to interact. Adults may interact at the one fuel station or restaurant. Residents may also interact through carpools related to either jobs or children's activities. However, interaction among residents is more likely within individual subdivisions, not with residents in nearby subdivisions.

Overall, access and mobility in northeast Bakersfield is constrained. Existing sidewalks in the project area serve the signalized intersections on State Route 178, especially near the Mesa Marin Sports Complex and Chevron gas station. Little pedestrian traffic is seen along the existing sidewalks in the project area since these are not located near community or commercial centers. There are no bus stops located in the project area to serve transit-dependent persons. A Class II bike lane runs along State Route 178 from State Route 184 to the eastern project limits.

Community Cohesion

Cohesive communities are associated with specific social characteristics. These may include long average lengths of residency, frequent personal contact, ethnic homogeneity, high levels of community activity, and shared goals. Some studies indicate that single-family home ownership, working class families, ethnic group clusters, mothers working at home, and the

elderly correlate with active community participation and high community cohesion. Residential stability and longevity can be a strong neighborhood link.

For northeast Bakersfield, the community has attributes that both strengthen and weaken cohesion. Residents are less diverse racially and ethnically than residents as a whole in Bakersfield and Kern County. Residents also have higher household income, lower levels of poverty, and a higher proportion of husband-wife households and owner-occupied single-family housing compared to the regional population. Many young families and a higher proportion of elderly, as indicated by the comparatively lower ratio of persons per household, also support the development of cohesion. All of these characteristics tend to characterize a more homogeneous and cohesive population.

However, the relative lack of community and public facilities, scattered subdivision development, and limited access and mobility for all modes of transportation work against the development of strong community cohesion. Moreover, the substantial conversion of undeveloped land and lack of long-time residents may have resulted in community instability over the past decade that is likely to continue for the foreseeable future as large subdivisions with hundreds and even thousands of residential lots continue to be built in northeast Bakersfield in the coming years. As a result, community cohesion is likely moderate to weak in northeast Bakersfield.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. Existing land uses, businesses, community and public facilities, and residences would remain unaffected, although the area would continue to experience rapid urbanization. In the absence of roadway improvements, access and mobility within and outside of the community and to downtown Bakersfield would deteriorate as traffic congestion and travel times increase.

By 2035, the corridor is forecast to decline to level of service F. These conditions would degrade the quality of life currently enjoyed by area residents. In addition, the number and severity of crashes may increase and safety for bicyclists and pedestrians would likely decline along the State Route 178 corridor. Based upon the analysis above, the No-Build Alternative could result in adverse impacts related to community character and cohesion.

Build Alternative

Community impacts from the Build Alternative are not anticipated in the project area and would not result in substantial changes to community character or cohesion. No businesses or residences would be displaced. Slivers of property along the corridor would be acquired for needed right-of-way. Acquisition would be similar under both design options with the exception of the area between Canteria Drive/Bedford Green Drive and Masterson Street where acquisitions would be needed on south side of the roadway.

The Build Alternative acquisition would affect the Mesa Marin Sports Complex, one of the community's key amenities. The acquisition would not require displacement or relocation of the existing softball diamonds. Somewhat increased noise levels would be experienced by adjacent residents and outdoor park users at the Mesa Marin Sports Complex.

The proposed roadway improvements would widen an existing highway. As such, the project does not involve the construction of a new roadway that would physically divide established neighborhoods or the northeast Bakersfield community. The overall character and boundaries of the existing community and individual subdivision neighborhoods would remain intact.

The planned highway widening and associated improvements would maintain acceptable levels of service and minimize risks of crashes. In this sense, quality of life would be preserved. The Build Alternative would incorporate new shoulder lanes allowing for continuous bicycle travel along the existing Class II bike lanes. These transportation improvements would help access and mobility to community and public facilities as well as planned commercial districts as development occurs within the corridor. Overall, residents would have improved access and mobility within the northeast Bakersfield community as well as between the community and downtown Bakersfield. Together, community interaction would not be adversely affected.

Construction Impacts

During construction of the Build Alternative, activities to widen State Route 178—vehicles using the highway as well as adjacent land uses—could be adversely affected. Noise, dust, and glare would affect properties within about 500 feet of the right-of-way. Best management practices would reduce these temporary construction effects. The contractor would be expected to use the existing highway right-of-way for construction staging and laydown, and construction impacts would not extend to an off-site staging property and adjacent properties. Localized construction impacts on residents and the Mesa Marin Sports Complex would be of short duration as construction moves along the corridor. Best management practices would reduce these temporary construction effects.

Construction vehicles and equipment usage would disrupt traffic on a temporary basis during the 24-month construction period. Efforts would be incorporated into the construction traffic management plan to minimize impacts during peak commute periods. Response time for emergency vehicles may potentially have adverse affects for short periods during the construction period, though recommended ongoing coordination with emergency response providers should minimize these effects. It is not anticipated that the roadway, bicycle, or pedestrian traffic along the corridor would be disrupted except for very short times. As such, vehicles would not be expected to use long circuitous routes to planned destinations such as jobs or shopping in downtown Bakersfield. At times, the number of lanes may be restricted; and nighttime and/or weekend construction activities may be required to reduce these adverse effects on quality of life for community residents. Overall, community character, interaction, and cohesion in the project study area residential subdivision neighborhoods would not change. Therefore, construction of the Build Alternative would not result in adverse impacts to community character or cohesion.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required.

2.1.3.2 Relocations and Real Property Acquisition

Regulatory Setting

Caltrans' Relocation Assistance Program 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 Part 24. The purpose of the Relocation Assistance Program is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

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 2000d, et seq.). Please see Appendix C for a copy of the Caltrans Title VI Policy Statement.

Affected Environment

Most of the land within the project study area and adjacent to State Route 178 consists of open space and scattered residential development. Some commercial and recreational uses exist south of State Route 178 between Canteria Drive and Masterson Street (Mesa Marin Sports Complex, Maria Bonita Mexican restaurant and a Chevron gas station). Residential land uses are clustered in the following locations: south of State Route 178 between Valley Street and Comanche Drive (single-family and estate homes); south of State Route 178 between Alfred Harrell Highway and Miramonte Drive (planned communities); north and

south of State Route 178 just east of Miramonte Drive (planned communities). A golf course is also south of State Route 178 and east of Miramonte Drive. Land use designations within the study area include mineral resources, public facilities, mixed use commercial, general and office commercial, and low-, medium- and high-density residential.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in the acquisition of adjacent land uses. Based on the analysis above, the No-Build Alternative would not result in impacts related to relocations and real property acquisitions.

Build Alternative

To widen State Route 178 and build associated improvements, minor land acquisitions, sliver takes—a small portion of a parcel is purchased but the existing use remains—totaling 52.4 acres of right-of-way would be required. No full parcel acquisitions would be required.

Sliver takes are mostly required for slope grading. Moreover, since State Route 178 is adjacent to large tracts of vacant land, most of the right of way impacts would involve partial acquisition of the undeveloped land next to the current roadways (see Table 2-7). These areas are zoned for residential and commercial uses.

Table 2-7 Required Right-of-Way Acquisitions

Land Use Designation	Build Alternative (acres)
Rural Residential	1.1
Estate Residential	2.4
Low Density Residential	11.2
Low-Medium Density Residential	13.5
High-Medium Density Residential	9.0
Mixed Use	2.8
General Commercial	10.1
Office Commercial	1.1
Mineral Petroleum and Minimum 5 acre Parcel	0.1
Resource Mgmt Area, Agriculture and Floodplains	0.8
Parks and Recreation Facilities	0.3
Total	52.4

Source: City of Bakersfield GIS, 2010.

The Build Alternative would have a direct affect on the Mesa Marin Sports Complex and the Maria Bonita Mexican restaurant. The area affected includes a sidewalk, vacant and undeveloped land, landscaped areas, an access drive, and parking. About 14,600 square feet

(0.33 acre) of frontage from the Mesa Marin Sports Complex would be acquired to accommodate the roadway widening. The portion of the park to be acquired currently includes a sidewalk, vacant and undeveloped land, and landscaped areas. The acquired area would not affect the softball fields, the primary recreational feature of the park. Similarly, about 9,539 square feet (0.22 acre) of frontage would be acquired from the Maria Bonita Mexican restaurant. The portion of the restaurant to be acquired includes the sidewalk fronting the restaurant, an access drive, parking, and several trees within the parking area. The impacts would not keep these facilities from operating.

Construction Impacts

The contractor would be expected to locate construction staging in the existing highway right-of-way and areas identified as future Build Alternative right-of-way and future detention basins. Therefore, temporary construction easements are not anticipated for the Build Alternative. Based on the analysis above, constructing the Build Alternative would not result in impacts related to relocations and real property acquisitions.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures are required when constructing the Build Alternative:

- **RA-1**—The existing sidewalk along the southern edge of State Route 178 will be reconstructed within the right-of-way being acquired from the park and restaurant.
- **RA-2**—Any impacts to landscaping and irrigation adjacent to the acquired right-of-way will be replaced and repaired.
- **RA-3**—The restaurant parking area will be reconfigured to allow continued access.

2.1.3.3 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* signed by President Clinton on February 11, 1994. This executive order 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 2011, low income was $22,350 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. Caltrans' commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement signed by the director (see Appendix C).

Affected Environment

The racial composition of the project study area was compared to the city of Bakersfield and Kern County (see Table 2-4). The 2010 total population for the project study area is 11,307. This is slightly greater than 3 percent of the city's overall population. The project study area has a demographic composition similar to the city of Bakersfield and Kern County. The largest differences are seen in the non-Hispanic White and Hispanic demographics. The remaining demographic groups in the project study area are similar to the city and county.

A majority of residents in the project study area are Non-Hispanic and White; this is more than 10 percentage points and more than 7 percentage points higher than either of the other two jurisdictions, respectively. The percentage of Hispanic population in the project study area is lower than both the city and county statistics. As such, the study area is more White and less Hispanic than either the City of Bakersfield or Kern County. As a whole, the study area does not encompass a minority community.

Table 2-8 shows economic characteristics for the project study area, the city of Bakersfield, Kern County, and the State of California for the year 2005–2009. Poverty estimates, based on income for families and individuals, represent an important indicator for economic viability. Families and individuals are classified as below poverty if their total family income was less than the Census Bureau's established poverty threshold specified for the applicable family size, age of householder, and number of related children present under the age of 18. According to the 2005 to 2009 American Community Survey published by the U.S. Census Bureau, within the project study area, 13 percent of the population over the age of 18 is below the poverty level. This is less than both the city of Bakersfield and Kern County.

Table 2-8 2009 Economic Characteristics

Economic Indicator	Project Study Area[1]	City of Bakersfield	Kern County	State of California
Median Household Income ($)	53,666	51,886	46,216	60,392
Per Capita Income ($)	25,772	22,601	19,939	29,020
Individuals Below Poverty Level (percent)	13	18	20	13

Source: United States Bureau of the Census, American Community Survey 2005-2009 data.

[1]Economic data was not available at the block group level. Therefore, the project area for this table is defined as Census Tracts: 9.10, 10 and 51.04 from the 2000 Census with a population total of 17,931.

Per capita income, the mean income computed for every man, woman, and child in a specific geographic area, is another indicator for an area's economic well being. To calculate the per

capita income, the total income for all people over the age of 15 is divided by the total population for the geographic area. The per capita income for the project study area is above the city of Bakersfield and Kern County but below the state.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in impacts related to environmental justice communities during construction.

Build Alternative

Based on the demographic analysis presented in Table 2-4 and Table 2-8, the project area has a lower percentage of minority groups and households below the poverty level than local and regional averages. Although a large percentage of people of Hispanic ethnicity (about 42 percent) live in the project area, this percentage is less than the city of Bakersfield and Kern County. Moreover, there are no disproportionately high and adverse impacts from the proposed project to this minority population. The proposed project would not displace or relocate any residences or businesses and would handle new commercial development by providing increased accessibility and relieving traffic congestion.

Based upon the analysis above, the Build Alternative would not cause disproportionate environmental consequences or impacts on environmental justice communities as stated in Executive Order 12898 regarding environmental justice.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required.

2.1.4 Utilities/Emergency Services

Affected Environment

Utilities

Public utilities refer to natural gas and electricity; communication lines, including telephone and cable service; potable (drinking) water; wastewater (sanitation); storm drains and flood control; and transmission and support facilities. Coordination with local public utility providers indicates that a number of utilities are within the project area and could be affected. These utilities include telecommunications, cable, electrical, water, and sewer. An underground 30-inch natural gas transmission pipeline, a high-risk utility, runs parallel to the north side of State Route 178 between Canteria Drive and east of State Route 184.

Emergency and Public Services

Emergency services for the project area are provided by the City of Bakersfield Police and Fire Department and by the California Highway Patrol. No emergency service facilities are within one-half mile of the proposed project. The closest fire station is 2.5 miles north of State Route 178 on Alfred Harrell Highway. About 1 mile north of State Route 178, a fire station is proposed at Paladino Drive. The closest hospital is Kern Medical Center on Mount Vernon Avenue about 5 miles west of the proposed project. The closest police station is on Panorama Drive near California State University, Bakersfield, about 4 miles northwest of the proposed project. Ambulance, fire fighting, and police service vehicles use State Route 178 for access to the project area and destinations beyond.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in impacts related to utilities since none would be affected. However, adverse impacts related to emergency service response times could result as roadway congestion increases and associated speeds decrease.

Build Alternative

No permanent adverse environmental consequences or impacts to utilities are anticipated with the Build Alternative since these utilities would either be relocated, in accordance with applicable standards, or avoided, as in the case of the 30-inch natural gas pipeline. The Build Alternative shifts the proposed alignment three feet to the south of the existing alignment between Canteria Road/Bedford Green Drive and Masterson Street to avoid the existing utility easement. Coordination with the pipeline owner has been initiated and would continue through the project planning and design phases to resolve any issues related to conflicts between the project design and the existing easement.

Benefits to emergency services response times are anticipated with the Build Alternative since widening State Route 178, plus other improvements, would likely reduce existing and future congestion-related delays as the study area continues to urbanize. Similarly, no adverse impacts to emergency services associated with service ratios are anticipated since no residential, commercial, or light industrial land uses are proposed.

Construction Impacts

Construction activities under the Build Alternative would include the relocation of several utilities:

- Aerial and buried telephone lines
- Aerial and buried cable lines
- Aerial and buried electrical lines
- Buried 8-inch gas line
- Several buried water lines (12 inch to 24 inch)
- Several buried sewer lines (12 inch to 18 inch)
- Street lights (10)
- Wooden utility poles (39)
- About 12,000 feet of buried 8-inch gas line

To avoid disruption of services during construction, utility relocations would be coordinated with the utility service providers, the City of Bakersfield, and Kern County Public Works departments. Detailed utility plans would be developed to identify utilities in conflict with project components and to avoid conflicts with existing facilities during construction. Utilities would be relocated in a manner that would reduce impacts to existing facilities and services. These efforts would ensure that utility disruptions are minimized. Therefore, no adverse construction impacts associated with utilities are expected with the Build Alternative.

Construction activities associated with the Build Alternative could involve short-term detours or temporary street closures. Therefore, the Build Alternative could result in temporary adverse impacts related to emergency service providers.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures are required during construction of the Build Alternative:

- **UE-1**—Prior to construction of the proposed project, Caltrans will coordinate with local emergency service agencies and prepare an Emergency Access Plan for their review. The plan will be used during project construction to maintain adequate emergency response times through the project study area.
- **UE-2**—Prior to construction of the proposed project, a Traffic Management Plan will be prepared by Caltrans in consultation with the city and all emergency service providers within the project study area. The plan will maintain access to local residential, commercial, and public facilities during construction.

2.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Regulatory Setting

Caltrans, as assigned by Federal Highway Administration, 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 Rigualtions 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.

Affected Environment

The Traffic Report (2011) was prepared for the proposed project. The report presents the results of existing and projected future traffic operations under both the No-Build Alternative and Build Alternative.

As discussed in section 1.2.2.1, traffic operations on a transportation facility are measured in terms of “level of service.” Level of service is defined from level of service A through level of service F. Level of service A is the least congested and level of service F is the most congested. Level of service E represents “at-capacity” operations. The level of service descriptions were previously shown in Figure 1-3.

Existing Roadways within the Project Study Area

State Route 178 extends east from State Route 99 in Bakersfield and across the southern Sierra Nevada Mountains to the Nevada state line in eastern Inyo County. Within the limits of Bakersfield, State Route 178 is functionally classified as a high-volume principal arterial and is designated as a terminal access route under the Surface Transportation Assistance Act network. It is also part of the interregional road system. State Route 178 starts at State Route 99 just west of downtown Bakersfield. The road continues as 24th Street but splits at B Street, using 24th Street for westbound travel and 23rd Street for eastbound travel through downtown Bakersfield. State Route 178 becomes a freeway as it leaves downtown and winds through East Bakersfield. Just east of the Fairfax Road interchange, the road narrows to a two-lane conventional highway. The highway continues through the rural but growing Rio Bravo section of Bakersfield. It then crosses State Route 184. Turning northeast, the route continues to the mouth of Kern River Canyon.

Within the study area, State Route 178 exists as a two-lane, undivided roadway with paved shoulders. The exception is widening adjacent to development on the south side between Comanche Drive and Miramonte Drive. The posted speed limit is 55 miles per hour. State

Route 178 is an important route for urban commuters in Bakersfield and is also a trans-Sierra route that provides access to Lake Isabella and the Sequoia National Forest.

State Route 184 intersects State Route 178 roughly midway between Fairfax Road and the mouth of Kern River Canyon. State Route 184, connecting State Route 178 to State Route 58, is mainly a two-lane conventional highway that expands to four lanes in Bakersfield and Lamont. It also connects the local agricultural land south of Bakersfield to State Route 58. This route is part of the California freeway and expressway system.

North of State Route 58, where State Route 184 is also Morning Drive, it enters the rural but growing eastern portion of Bakersfield. At the Morning Drive and Niles Street and Kern Canyon Road intersection, the route turns right and northeast onto Kern Canyon Road and travels through open grassland. State Route 184 terminates at its intersection with State Route 178.

Alfred Harrell Highway, maintained by the City of Bakersfield, is a local road traversing the northern edge of the study area. From its western end at Mount Vernon Drive to Hart Memorial County Park, it is a four-lane divided freeway. East of Hart Park, the road is a two-lane highway that connects with State Route 178 at Comanche Drive (South).

Canteria Drive is a two-lane minor arterial that extends north from State Route 178 to Bakersfield's Hills residential development. As Canteria Drive intersects State Route 178, traffic movement is controlled with signals.

Miramonte Drive lies to the east of Park Palisade Drive and is currently a two-lane collector street serving the Rio Bravo Country Club and residential development. A traffic signal controls intersection turning and through-traffic movements at State Route 178.

Existing Traffic Conditions

The Traffic Report evaluated 10 intersections:

- State Route 178 and Canteria Drive/Bedford Green Drive
- State Route 178 and State Route 184/Masterson Street
- State Route 178 and Valley Street
- State Route 178 and View Street
- State Route 178 and Green Hill Street
- State Route 178 and Comanche Drive
- State Route 178 and Alfred Harrell Highway
- State Route 178 and Park Palisade Drive

- State Route 178 and Miramonte Drive
- State Route 178 and Rancheria Road

As summarized in Table 2-9, the segments along State Route 178 between Morning Drive and Miramonte Drive operate at level of service C or better under existing (2008) conditions.

Table 2-9 Existing (2008) State Route 178 Segment Peak Hour Level of Service

Segment	Morning Peak Hour		Evening Peak Hour	
	Two-Way Volume	Level of Service	Two-Way Volume	Level of Service
Morning Drive to Canteria Drive	1,273	C	1,021	C
Canteria Drive to State Route 184/Masterson Street	1,191	C	956	C
State Route 184/Masterson Street to Alfred Harrell Highway	1,149	C	879	C
Alfred Harrell Highway to Miramonte Drive	688	B	620	B
Miramonte Drive to Rancheria Road	291	A	256	A

Source: Traffic Report (2011)

As shown in Table 2-10, all ten intersections along the State Route 178 mainline operate at level of service C or better under existing conditions with the exception of the following two intersections:

- State Route 178 and State Route 184/Masterson Street (level of service F at morning peak hour and level of service E at evening peak hour)
- State Route 178 and Valley Street (level of service D at morning peak traffic hour)

The level of service F operation at the State Route 178 and State Route 184/Masterson Street intersection is caused by left-turn movement from northbound State Route 184 onto westbound State Route 178. At the State Route 178 and Valley Street intersection, right-turn movement from southbound Valley Street onto westbound State Route 178 causes the level of service D operation.

Table 2-10 Existing (2008) Intersection Peak Hour Level of Service

Intersection	Traffic Control	Peak Hour	Delay[1] (seconds)	Level of Service[2]
State Route 178 and Canteria Drive	Traffic signal	Morning	14.7	B
		Evening	6.7	A
State Route 178 and State Route 184/Masterson Street[3]	Two-way stop	Morning	ECL	F
		Evening	49.7	E
State Route 178 and Valley Street[3]	One-way stop	Morning	27.1	D
		Evening	19.2	C
State Route 178 and View Street	One-way stop	Morning	21.8	C
		Evening	16.3	C
State Route 178 and Green Hill Street	Two-way stop	Morning	24.9	C
		Evening	17.7	C
State Route 178 and Comanche Drive	Two-way stop	Morning	23.1	C
		Evening	15.4	C
State Route 178 and Alfred Harrell Highway	Traffic signal	Morning	23.5	C
		Evening	20.3	C
State Route 178 and Park Palisade Drive	One-way stop	Morning	9.1	A
		Evening	9.6	A
State Route 178 and Miramonte Drive[3]	Traffic signal	Morning	19.7	B
		Evening	10.7	B
State Route 178 and Rancheria Road	One-way stop	Morning	9.8	A
		Evening	8.9	A

Source: Traffic Report (2011)

[1]Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle. At a two-way stop-controlled intersection, delay refers to the worst movement.
[2]Level of Service calculations are based on the methodology outlined in the 2000 Highway Capacity Manual and performed using Synchro 6.0.
[3]Delays observed in the field were less than what is reported.
ECL = exceeds calculable limits (typically reported when the delay exceeds 180 seconds).

Bicycle and Pedestrian Facilities

According to the Metropolitan Bakersfield Bikeway Master Plan (previously discussed), designated Class II and Class III bicycle routes are planned within the project limits. The designated Class II bicycle route would run along State Route 178 from Kern Canyon Road/Masterson Street eastward to the city limits. The designated Class III bicycle route would run along the Alfred Harrell Highway. These planned routes are currently not marked as bike routes.

Existing pedestrian facilities have been built at Mesa Marin Park, Canteria Drive, and the intersection of State Route 184 and Masterson Street on the south side of State Route 178. Sidewalks were built south of State Route 178 between Alfred Harrell Highway/Comanche Drive and Miramonte Drive as a part of the State Route 178 improvements made by the developer of the residential tract between those streets.

Public Transportation

The transit agency for the City of Bakersfield is the Golden Empire Transit District. The closest transit route is located west of the project at Morning Drive. In addition, the proposed project is within the service area of Consolidated Transportation Services Agency, a local organization that provides low cost on-demand service to seniors in the Bakersfield area.

Americans with Disabilities Act Facilities

With the exception of wheelchair accessible sidewalk curb ramps at the corners of State Route 178/Canteria Drive, State Route 178/Alfred Harrell Highway, and State Route 178/Miramonte Drive, no Americans with Disabilities Act facilities are available within the project area. Improvements are not consistent throughout the study area.

Environmental Consequences

No-Build Alternative

2015 and 2035 Traffic Impacts

Due to rapid growth in the Bakersfield area, expected population growth, and large land areas already approved (entitled) for residential development adjacent to State Route 178 east of Vineland Road, traffic volumes are expected to grow substantially from existing conditions. As a result, forecasted traffic volumes are expected to reach three times the existing levels by 2035 along State Route 178. Table 2-11 summarizes the forecasted average daily traffic for the project area in 2015 (opening year of the proposed project) and 2035 (design year of the proposed project) without the proposed project (No-Build Alternative). Overall, 2035 forecasts for daily volumes are higher than the 2015 forecasts under this scenario.

Table 2-12 summarizes the forecasted intersection levels of service predicted for the project area in 2015 (opening year of the project). In 2015, without project conditions, seven of the 10 study intersections are projected to operate at unacceptable levels of service E or F during morning and evening peak hours:

- State Route 178 and Canteria Drive/Bedford Green Drive
- State Route 178 and State Route 184/Masterson Street
- State Route 178 and Masterson Street
- State Route 178 and View Street
- State Route 178 and Green Hill Street
- State Route 178 and Comanche Drive
- State Route 178 and Alfred Harrell Highway

Table 2-11 Forecasts of Average Daily Traffic without the Proposed Project (No-Build Alternative) for 2015 and 2035

Segment	Number of Lanes	Number of Vehicles Eastbound	Number of Vehicles Westbound	Number of Vehicles Total
2015				
State Route 178 from Morning Drive interchange to Canteria Drive intersection	4	18,677	17,453	36,130
State Route 178 from Canteria Drive intersection to Masterson Street intersection	2	13,822	13,304	27,126
State Route 178 from Masterson Street intersection to Alfred Harrell Highway intersection	2	11,867	11,403	23,270
State Route 178 from Alfred Harrell Highway intersection to Miramonte Drive intersection	2	11,768	11,188	22,956
State Route 178 from Miramonte Drive intersection to Rancheria intersection	2	4,399	4,169	8,568
State Route 178 east of Rancheria Road intersection	2	2,539	2,377	4,916
2035				
State Route 178 from Morning Drive interchange to Canteria Drive intersection	4	34,532	29,304	63,836
State Route 178 from Canteria Drive intersection to Masterson Street intersection	2	16,664	16,217	32,881
State Route 178 from Masterson Street intersection to Alfred Harrell Highway intersection	2	15,231	15,173	30,404
State Route 178 from Alfred Harrell Highway intersection to Miramonte Drive intersection	2	14,368	14,422	28,790
State Route 178 from Miramonte Drive intersection to Rancheria intersection	2	7,566	7,545	15,111
State Route 178 east of Rancheria Road intersection	2	4,521	4,490	9,011

Source: Traffic Report (2011)

Table 2-12 Opening Year (2015) Intersection Levels of Service

Intersection	Traffic Control	No-Build Conditions				Build Conditions			
		Morning Peak Hour		Evening Peak Hour		Morning Peak Hour		Evening Peak Hour	
		Level of Service	Average Delay (seconds)[1]	Level of Service	Average Delay (seconds)	Level of Service	Average Delay (seconds)	Level of Service	Average Delay (seconds)
State Route 178 and Canteria Drive/ Bedford Green Drive	Signal	**F**	**146.3**	**F**	**105.1**	B	18.4	C	20.9
State Route 178 and State Route 184/ Masterson Street (northbound/ southbound)	Stop	**F**	**>300**	**F**	**>300**	B	11.0	C	18.3
State Route 178 and Masterson Street	Signal (future)	**F**	**84.4**	**E**	**78.3**	D	35.8	C	27.0
State Route 178 and Valley Street (southbound)	Stop	C	22.5	D	34.0	B	13.4	B	12.2
State Route 178 and View Street (northbound)	Stop	D	25.9	**E**	**39.8**	B	10.1	B	14.6
State Route 178 and Green Hill Street (northbound/ southbound)	Stop	D	31.0	**F**	**59.6**	B	12.4	B	14.3
State Route 178 and Comanche Drive (southbound)	Stop	**E**	**41.1**	**F**	**129.3**	B	11.7	B	10.6
State Route 178 and Alfred Harrell Highway	Signal	**F**	**90.7**	D	42.9	C	29.5	C	21.7
State Route 178 and Park Palisade Drive (northbound)	Stop	A	9.3	B	10.8	A	9.6	B	11.1
State Route 178 and Miramonte Drive	Signal	C	34.0	D	40.9	C	30.3	C	30.6

Source: Traffic Report (2011)

[1]Average control delay calculated using the Highway Capacity Manual (2000 Transportation Research Board) methodology and Synchro 6.0 analysis software.
Bold font=failing conditions from a design perspective that should be avoided.

Table 2-13 summarizes the forecasted intersection levels of service for the project area in 2035 (design year of the project). In 2035, with the No-Build Alternative), 10 of the 11 study intersections are projected as level of service F during morning and evening peak hours. Table 2-14 shows that peak hour level of service for the segments improves under the Build Alternative in 2035.

Table 2-13 Design Year (2035) Intersection Levels of Service

Intersection	Traffic Control	Without Project (No-Build)				Build Conditions			
		Morning Peak Hour		Evening Peak Hour		Morning Peak Hour		Evening Peak Hour	
		Level of Service	Average Delay (Seconds)[1]	Level of Service	Average Delay (Seconds)	Level of Service	Average Delay (Seconds)	Level of Service	Average Delay (Seconds)
State Route 178 and Canteria Drive/ Bedford Green Drive	Signal	**F**	**>300**	**F**	**>300**	D	41.5	D	46.0
State Route 178 and State Route 184/ Masterson Street (northbound/ southbound)	Stop	**F**	**>300**	**F**	**>300**	B	14.2	**F**[2]	**178.5**
State Route 178 and Masterson Street	Signal (future)	**F**	**192.0**	**F**	**192.9**	D	44.8	C	27.2
State Route 178 and Valley Street (southbound)	Stop	**F**	**73.8**	**F**	**181.0**	D	25.9	B	12.7
State Route 178 and View Street (northbound)	Stop	**F**	**163.5**	**F**	**>300**	B	12.4	D	26.3
State Route 178 and Green Hill Street (northbound/ southbound)	Stop	**F**	**181.1**	**F**	**>300**	C	21.2	C	24.7
State Route 178 and Comanche Drive (southbound)	Stop	**F**	**>300**	**F**	**>300**	C	17.3	B	11.0
State Route 178 and Alfred Harrell Highway	Signal	**F**	**131.1**	**F**	**110.4**	D	37.9	C	23.8
State Route 178 and Park Palisade Drive (northbound)	Stop	B	10.4	B	14.0	B	11.0	C	15.5
State Route 178 and Miramonte Drive	Signal	**F**	**143.4**	**F**	**130.7**	D	37.7	C	32.1

Source: Traffic Report (2011)

[1]Average control delay calculated using the Highway Capacity Manual (2000 Transportation Research Board) methodology and Synchro 6.0 analysis software.
[2]While the northbound right-turn/westbound left-turn delay indicates level of service F, the SimTraffic simulation indicates better operating conditions than the results reported in this table.
Bold font=failing conditions from a design perspective that should be avoided.

Table 2-14 Design Year (2035) Peak Hour Level of Service

Segment	Demand Volumes			
	Morning Peak Hour		Evening Peak Hour	
	Westbound	LOS	Eastbound	LOS
2035 Build Scenario				
Morning Drive to Canteria Drive	3,095	B	3,840	C
Canteria Drive to State Route 184/Masterson Street	2,190	B	2,705	C
State Route 184/Masterson Street to Alfred Harrell Highway	1,945	D	2,165	C
Alfred Harrell Highway to Miramonte Drive	1,345	B	1,530	B
Miramonte Drive to Rancheria Road	860	D	775	C
Rancheria Road to Kern River Canyon	450	B	435	B
2035 No-Build Scenario				
Morning Drive to Canteria Drive	2,960	C	2,515	C
Canteria Drive to State Route 184/Masterson Street	1,715	F	2,035	F
State Route 184/Masterson Street to Alfred Harrell Highway	1,470	F	1,705	F
Alfred Harrell Highway to Miramonte Drive	1,025	F	1,250	F
Miramonte Drive to Rancheria Road	570	C	675	C
Rancheria Road to Kern River Canyon	255	B	345	B

Source: Traffic Report (2011)
LOS=level of service

Under the No-Build Alternative, existing State Route 178 would be maintained, no widening would occur, and it would remain a two- and four-lane highway within the project limits. As such, by 2015, operations would deteriorate to level of service F at all signalized intersections west of Miramonte Drive. By year 2035, all study intersections along State Route 178 (with the exception of one study intersection at Park Palisade Drive) would operate at level of service F. In addition, based on the daily travel statistics produced by the Kern Council of Governments 2006 Regional Travel Demand Model for 2035 No-Build and Build Alternatives conditions, overall daily vehicle miles traveled would increase for the No-Build Alternative. This increase is a result of motorists choosing alternate routes to access downtown Bakersfield to bypass areas of congestion. Vehicle hours traveled would also increase in the same pattern as vehicle miles traveled as average speeds decrease.

Bicycle and Pedestrian Facilities

The No-Build Alternative does not propose any roadway improvements. There would be no impacts to bicycle and pedestrian facilities. New facilities, the timing of which is unknown, would be implemented as development projects are approved and constructed in the area.

Public Transportation

The No-Build Alternative would result in increased congestion and deterioration in level of service. This may discourage public transportation patrons from seeking to use local bus services.

Americans with Disabilities Act Facilities

The No-Build Alternative does not propose any changes to existing conditions. State Route 178 does not currently provide improvements such as continuous sidewalks on at least one side of the roadway throughout the study area that are consistent with the Americans with Disabilities Act requirements. With the No-Build Alternative, the improvements necessary to comply with the Americans with Disabilities Act would be constructed as development occurs. This would result in improvements that are not consistent or continuous throughout the study area and the timing of the improvements would be uncertain.

Based on the information above, the No-Build Alternative would result in adverse impacts related to traffic, transportation, and pedestrian and bicycle facilities.

Build Alternative

Year 2015 and 2035 Traffic Impacts

As shown in Table 2-12, under 2015 (opening year of the proposed project) build alternative conditions, the signalized intersections would collectively operate at level of service C. The unsignalized intersections would collectively operate slightly above level of service B during the morning peak hour and slightly below level of service B during the evening peak hour.

Under 2035 (design year of the project) build conditions, the signalized intersections along State Route 178 would collectively operate at level of service D during the morning and evening peak periods. The unsignalized intersections would operate at level of service C during peak hour conditions. The State Route 178 and State Route 184/Masterson Street intersection, which has a two-way traffic stop, would operate at level of service F during the evening peak period under 2035 build conditions. The level of service F occurs because the State Route 184 approach to State Route 178 is stop sign controlled. Software used to determine level of service is based on the worst performing leg of an intersection, which is the stop controlled leg (State Route 184) rather than the free flowing legs (State Route 178). Based on further study, using additional traffic engineering software tools and professional judgement, it was concluded that the upstream traffic signal at the State Route 178 and Canteria Drive intersection would create gaps in the flow of traffic towards the State Route 178 and State Route 184 intersection. These gaps would allow turning movements at the State Route 178 and State Route 184 intersection to operate at the design standard level of service.

Table 2-15 shows daily travel statistics produced by the Kern Council of Governments 2006 Regional Travel Demand Model for the 2035 No-Build and Build Alternatives. The table shows that even with the projected increase in traffic volumes, overall daily vehicle miles traveled, and vehicle hours traveled would decrease with the Build Alternative. The table

also shows that the Build Alternative has fewer vehicle hours traveled and higher average speeds than the No-Build Alternative.

Table 2-15 Regional Travel Model, Measures of Effectiveness

Facility Type	Daily Vehicle Miles Traveled and Vehicle Hours Traveled by Facility Type					
	2035 No-Build			Build Alternative		
	Vehicle Miles Traveled	Vehicle Hours Traveled	Average Speed	Vehicle Miles Traveled	Vehicle Hours Traveled	Average Speed
Freeways	20,160,454	311,656	64.69	20,161,918	311,699	64.68
Expressways	1,009,989	22,801	44.30	1,008,871	22,772	44.30
Major arterials	15,401,052	438,657	35.11	15,415,333	436,250	35.34
Minor arterials	1,792,727	65,640	27.31	1,781,125	65,373	27.25
Collectors	786,738	38,307	20.54	773,629	37,845	20.44
Centroids	2,444,401	110,749	22.07	2,444,465	110,750	22.07
Diamond ramps	420,084	21,033	19.97	419,711	21,117	19.88
Loop ramps	34,795	1,852	18.79	34,854	1,873	18.61
Cordon	656,031	32,801	20.00	656,031	32,801	20.00
All Facilities	42,706,271	1,043,496	40.93	42,695,938	1,040,479	41.03

Source: Traffic Report (2011)

As shown in Table 2-14, with the Build Alternative, more vehicles would utilize State Route 178 compared to the No-Build Alternative. Motorists would be able to take advantage of the widened highway to access downtown Bakersfield, as the route would be less congested and more efficient, resulting in decreased travel time for commuters. Compared to the No-Build Alternative, three of the segments studied would experience marked improvements in level of service.

The segment between the Alfred Harrell Highway and Miramonte Drive would improve from level of service of F under the No-Build Alternative to level of service B in both the morning and evening peak hours. The segment between Canteria Drive and State Route 184 and Masterson Street would improve from level of service F (morning and evening peak hours) to level of service B during the morning peak hour and level of service C during the evening peak hour traffic. The segment between State Route 184 and Masterson Street to the Alfred Harrell Highway would improve from a level of service of F (morning and evening peak hours) under the No-Build Alternative to level of service D (morning peak hour) and C (evening peak hour) under the Build Alternative. The segment between Rancheria Road and Kern Canyon would continue to experience level of service B (morning and evening peak hours) under the Build and No-Build Alternatives.

The segment between Miramonte Drive and Rancheria Road would worsen from level of service of C under the No-Build Alternative to level of service D under the Build Alternative (morning peak hour). Under both the Build and No-Build Alternatives, this segment would

experience level of service of C (evening peak hour). The segment between Morning Drive and Canteria Drive would experience an improvement in level of service from C (No-Build Alternative) to level of service B (Build Alternative) during the morning peak hour. During the evening peak period, both the Build and No-Build Alternatives would experience level of service C within this segment The Build Alternative is expected to have a beneficial impact by relieving future congestion and allowing planned growth in the area.

Bicycle and Pedestrian Facilities

There are no permanent impacts anticipated for the existing bicycle facilities along State Route 178 and Alfred Harrell Highway. The Build Alternative would include 8-foot-wide shoulders to accommodate pedestrians and cyclists. Dedicated (striped) Class II bike lanes would be provided at intersections with dedicated right-turn lanes. All intersections would have 4-foot-wide bike lanes and 4-foot-wide shoulders with the exception of the intersection at Miramonte Drive where a 4-foot-wide bicycle lane and 8-foot-wide shoulder would be provided.

The proposed project improvements, therefore, would not conflict with the City of Bakersfield plans for bicycle and pedestrian facilities, but would actually help in their construction.

Based upon the analysis provided above, the Build Alternative would not result in adverse impacts related to transportation, traffic, and pedestrian and bicycle facilities.

Construction Impacts

The Build Alternative would temporarily affect motoring vehicular, bicycle, and pedestrian traffic during construction. Construction work would occur along State Route 178 and some adjacent side streets and in require temporary street closure with detours of motoring and bicycle traffic, and possibly pedestrian traffic.

Construction activities would occur in two stages:

- Stage 1 primarily involves widening the outside lanes of both the westbound and eastbound sides of the State Route 178 mainline (roadway). This stage includes clearing and grubbing (removing vegetation), utility relocation, cut-and-fill earthwork, removing the westbound and eastbound shoulders, and constructing the outside lanes. In the areas where the pavement matches the existing curb line—Canteria Road to Masterson Street and east of Alfred Harrell Highway to Miramonte Drive—widening would occur only on the north side. During this stage, traffic would be maintained on the existing roadway.
- Stage 2 would primarily rehabilitate the existing roadway. A raised median would be constructed between Canteria Road and Miramonte Drive. Existing pavement remaining would be resurfaced along the inside shoulders in both eastbound and westbound

directions. Between the beginning of the project and Canteria Road, one lane in each direction would be built in the median of the existing 4-lane freeway section.

The majority of the construction activities would occur during daytime hours, although portions of the improvements such as street realignment and intersections) would occur at night. No detours are expected to be necessary. Construction is anticipated to take about 24 months to complete. State Route 178 would be open through all stages of construction.Public Transportation

There are no transit routes that would be affected by the Build Alternative during construction. However, some incidental shuttle-bus service delays could occur during construction.

Americans with Disabilities Act Facilities

Some existing Americans with Disabilities Act facilities may be affected during construction of the Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures would minimize environmental consequences and impacts and should be used during construction:

- **T-1**—A Traffic Management Plan will be prepared and submitted by Caltrans to the City of Bakersfield for review and approval prior to the initiation of construction. The plan would include the following elements: public information/public awareness; designation of haul routes for construction-related trucks; the location of access to the construction site; driveway turn restrictions; temporary traffic control devices or flagmen; travel time restrictions for construction-related traffic to avoid peak travel periods on selected roadways; and designated parking and staging areas for workers and equipment.
- **T-2**—A Construction Zone Enhanced Enforcement Program may be appropriate during project construction. The program involves the presence at all times of the California Highway Patrol in construction zones to remind motorists to slow down and use caution when traveling through work areas. The Caltrans Construction Division would be consulted to determine if a Construction Zone Enhanced Enforcement Program should be prepared and implemented. The Caltrans Construction Division should be consulted regarding requirements for the program.

2.1.6 Visual/Aesthetics

Regulatory Setting

The National Environmental Policy Act of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 United States Code 4331[b][2]). To further emphasize this point, the Federal Highway Administration, in its

implementation of the National Environmental Policy Act (23 USC 109[h]), directs that final decisions regarding projects are to be made in the best overall public interest, taking into account adverse environmental impacts, including the destruction or disruption of aesthetic values.

Likewise, the California Environmental Quality Act establishes, under Public Resources Code Section 21001[b], 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."

Affected Environment

The following discussion is based on the 2011Visual Assessment conducted for the proposed project.

Visual Setting

Located near the eastern limits of the City of Bakersfield, the project study area consists of open, undeveloped land, semi-rural land uses, and newer residential developments. Within the western limits of the project study area, the topography is relatively flat, changing to gently rolling foothills along the project's eastern limits. From the western end of the project study area to about Valley Street, the areas adjacent to State Route 178 are characterized primarily by open, undeveloped land covered by non-native grasses. Between Valley Street and Comanche Drive, residential uses line the north and south sides of State Route 178. With the exception of a few properties, these residences are oriented away from the roadway.

From Alfred Harrell Highway to the project's eastern limit, newer residential developments line both the north and south sides of State Route 178. Residences south of the roadway are located in fenced communities with views oriented inward. North of State Route 178, the housing developments are on hillside lots. Homes located along the perimeter of these developments have views of the surrounding area, including the Sierra Nevada Mountains and State Route 178. Starting just east of Miramonte Drive, State Route 178 dips down to meet the valley floor and the agricultural orchards and farmlands that surround the Kern River.

The Kern River provides a unique natural feature within the northeastern Bakersfield area and is an important aspect of the area's character. Although adding unique character to the northeastern city limits, the Kern River is not visible from within the project study area, and land surrounding the Kern River is only visible from limited locations within the project study area such as from the residential development east of Miramonte Drive and north of State Route 178 and from the eastern extent of State Route 178 within the project corridor.

More prominent and visible from elevated areas within the project study area and from the eastbound lanes of State Route 178, is the Sierra Nevada Mountain Range to the east.

Visual Resources

State Route 178 is not a classified scenic highway according to the California Scenic Highway Mapping System; however, the Metropolitan Bakersfield Freeway Beautification: Master Plan Design Guidelines identify State Route 178 at Rancheria Road as a community entrance, or gateway, to the City of Bakersfield. Gateways are intended to produce a sense of arrival into a city and are typically designated by providing a landmark or design aspect reflecting the unique quality of a city and surrounding areas. Gateways are also intended to manifest community pride and establish a landmark feature.

Views and Sensitive Viewer Groups

Figure 2-6 and Figure 2-7 show representative views of visual resources along State Route 178. Views of and from State Route 178 are limited to adjacent uses or corridor views within the more densely developed stretches of the highway. Where residential development is dense, large, mature trees provide shady relief and vertical interest. Residences north of State Route 178 on hillside lots have some views of surrounding areas and the mountains to the east. Undeveloped portions of the corridor allow for expansive views across open ground to second row development or rolling foothills

Motorists traveling along State Route 178 have views of the roadway and surrounding areas depending on the extent and type of development adjacent to the highway. Low shrubs and light vegetation cover undeveloped open space along most of the highway. Views from these areas expand beyond the highway corridor to include surrounding development and distant vistas.

Starting west of Masterson Street and traveling east along State Route 178, motorists primarily have views of flat, open space or cleared land with rolling hills to both the north and south until Valley Street. Continuing eastward, surrounding views after Valley Street include pockets of residential neighborhoods with exterior property walls, vegetation, and mature trees. Beyond Miramonte Drive and continuing eastward, motorists have immediate views of orchards (primarily citrus groves) and expansive views of the mountains in the far distance.

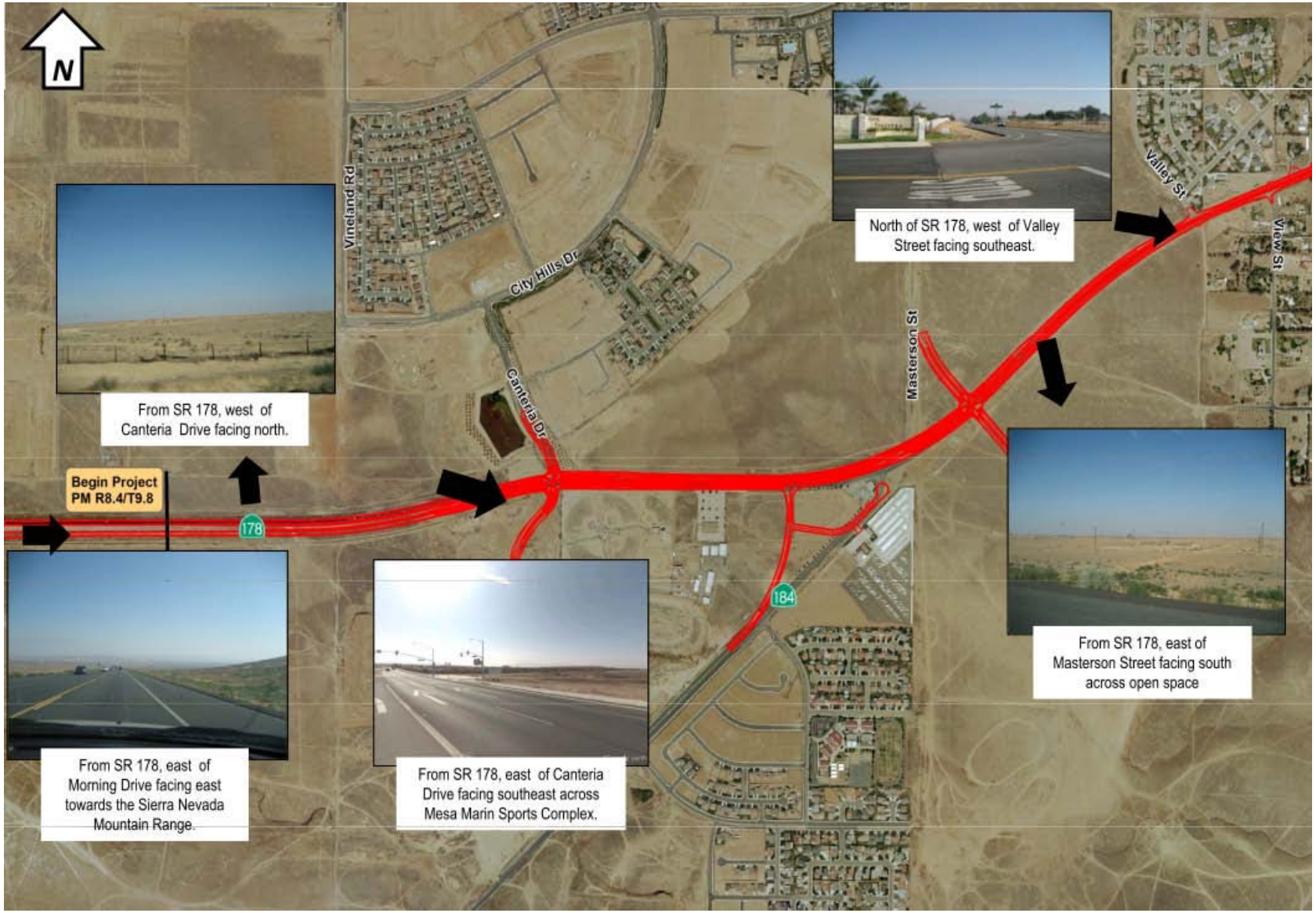


Figure 2-6 Existing Views A

Figure 2-7 Existing Views B

The primary viewer groups within the project study area are residents and motorists. These two viewer groups are considered moderately to highly sensitive to changes in the visual environment. They are familiar with the highway corridor and view it on a regular basis. The highway is also used for access to more remote destinations and would include some motorists who are recreational or destination users. Recreational and destination users would be less familiar with the highway corridor and less sensitive to visual changes; therefore, for this analysis, the primary motorists are considered to include local residents and others who are more familiar with the highway corridor.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current State Route 178 configuration would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to visual or aesthetic resources since no changes to views or light and glare would result.

Build Alternative

Shifts to the roadway alignment and realignment of State Route 184 south of the State Route 178/State Route 184 intersection may result in the removal of several pine trees that currently line the south side of State Route 178 and north side of State Route 184. Removal of the pine trees would result in limited and localized changes in shade and shadow patterns; however, the plantings are isolated and do not contribute to an overall landscape theme or aesthetic character. The addition of traffic signals at Masterson Street would have a limited effect on the light environment because of the area's generally urban character and the highway's current function as a transportation corridor with associated vehicle headlights and reflective surfaces.

The Build Alternative has no large elevated components that would block views or detract from distant vistas. The Noise Study Report (2011) indicates that noise impacts would occur at several noise sensitive locations. The Noise Abatement Decision Report (2011), in a preliminary determination, indicates that construction of noise barriers at these locations does not meet Caltrans' reasonableness criteria. Therefore, based on this preliminary determination, noise barriers are not recommended and would not present an issue related to views, visual quality, or character.

Existing detention basins would be modified to collect and meter storm-water runoff. In addition, new detention basins would be constructed to manage storm-water and surface runoff. The new detention basins would be located primarily within the roadway right-of-

way; however, about 0.9 acre of additional right-of-way would be required to accommodate new basins about 4- to 6-feet deep. The basins would require fencing as they exceed the 3-foot maximum depth for non-fenced basins. It is anticipated that the fencing would be 6-feet-high chain link. The side slopes would be stabilized using erosion control netting and hydroseeding. The detention basins would not affect scenic views or block scenic vistas. However, their size, depth, and fencing would be slightly out of character with the surrounding area and would stand out against the primarily flat and undeveloped landscape.

To widen the existing freeway, land within the right-of-way area would need to be 'cut' or 'filled' in order to level the area for paving. The cut and fill slopes would be required throughout the project alignment both north and south of the highway. These cut and fill slopes would generally be 1- to 3-feet or 4- to 6-feet high with a few minor cuts or fills higher than 10 feet. Slopes exceeding 5 feet in height would look out of character with the natural landforms and, where visible from the highway or adjacent residential areas, would affect the visual quality of local views. However, less than 18 percent of the cut slopes exceed 5 feet in height and of those, only 1 percent are over 7 feet in height. Fill slopes over 5-feet high represent 32 percent of the total linear feet of fill. Less than 1 percent of those are over 7-feet high. Given the length of the project and the percent of necessary landform alterations, the visual impact to key viewer groups is not considered substantial.

The general character of the project study area is changing from semi-rural to more densely developed, with a mix of upscale planned communities, commercial areas, open space, and orchards. Development of the surrounding area in conjunction with construction of the Build Alternative would result in an anticipated overall change in the visual character of the project study area from urban/rural to urban. This change would be consistent with the planned development trend and conversion to urban development outlined in the Metropolitan Bakersfield General Plan and would not result in impacts to visual resources, visual quality, or visual character beyond those evaluated in the Metropolitan Bakersfield General Plan Environmental Impact Report. The proposed project is consistent with the development improvements identified in the general plan.

The Metropolitan Freeway Beautification Master Plan Design Guidelines provides a long range strategy for improving the aesthetics of principal arrival gateways and transportation corridors within the metropolitan area of Bakersfield. The Build Alternative is not located within an area addressed by this master plan; however, the design guidelines call for preservation of views at the Alfred Harrell Highway and State Route 178 interchange, as well as identification of an arrival gateway at the future Rancheria Road and State Route 178 interchange. The proposed project would not affect the goals and objectives of the master

plan or preclude the preservation of views at the Alfred Harrell Highway and State Route 178 interchange or an arrival gateway at the Rancheria Road and State Route 178 intersection.

Based upon the analysis above, the Build Alternative would not result in adverse impacts to visual or aesthetic resources.

Construction Impacts

During construction, area residents and motorists would have views of construction staging areas, heavy equipment, safety and directional signage, and, if nighttime construction is required, safety and security lighting. Areas cleared for construction would look bare and unattractive. Construction activities would be most visible from elevated areas, State Route 178, and areas adjacent to the highway that have open views to the road. Depending on the stage and type of construction, these effects may be more or less visible and may occur throughout the corridor or in spot locations.

The visual effects of construction would be temporary and limited in their extent. Areas that are not permanently converted to highway-related uses would return to their natural state over time and eventually blend with the surrounding area. Because construction effects are limited in their extent and duration, they would not be substantial and would not have an adverse impact on the visual environment.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and/or mitigation measures would minimize environmental consequences and impacts and should be used during construction:

- **VIS-1**—The contractor will be required to maintain good housekeeping in and around construction sites, staging areas, and equipment storage areas.
- **VIS-2**—Where feasible and applicable, the contractor will be required to screen or locate equipment, construction materials, and debris in areas that are not visible to area residents and motorists.
- **VIS-3**—Where nighttime construction lighting is required, the contractor will, where feasible and applicable, use measures that reduce glare and spillover light.

To enhance the proposed detention basins, the proposed project would use the following measures where feasible and applicable:

- **VIS-4**—Avoid geometric shapes by undulating detention basins to have a more natural appearance
- **VIS-5**—Use black vinyl-coated fencing or similar fencing material to reduce the view of the fence surrounding the detention basins

- **VIS-6**—Select hydroseed material that is native to the area or matches the existing vegetation
- **VIS-7**—Screen basins from key viewers (motorists and residents) by using native plant materials or similar material to blend with surroundings

To reduce the visual effects of cut and fill slopes exceeding 5 feet in height, the proposed project would use the following measures:

- **VIS-8**—Round slopes where applicable
- **VIS-9**—Vary slopes from 2:1 to 4:1 where feasible
- **VIS-10**—Use native plant materials for erosion control within disturbed areas or match to blend with surrounding plant materials.

2.1.7 Cultural Resources

Regulatory Setting

"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, as amended, sets forth national policy and procedures regarding historic properties defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement between the Advisory Council, the Federal Highway Administration, State Historic Preservation Officer, and Caltrans went into effect for Caltrans projects, both state and local, with Federal Highway Administration involvement. The Programmatic Agreement implements the Advisory Council's regulations under 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The Federal Highway Administration's responsibilities under the Programmatic Agreement have been assigned to Caltrans as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 327) (July 1, 2007).

Affected Environment

The information presented in this section is based on the Archeological Survey Report (2011), Supplemental Archaeological Survey Report (2012) and Historical Property Survey

Report (2012) prepared for the proposed project. Results of the record searches (2007 and 2009), field surveys (2009, 2010, 2011 and 2012), and consultation with historical societies, research institutions, and Native American groups (2007, 2009, 2011 and 2012) identified no resources within the Area of Potential Effects listed or eligible for listing on the National Register of Historic Places, California Register of Historic Resources, or California Points of Historical Interest. Architectural resources present in the Area of Potential Effects were determined exempt from evaluation since standing structures are all less than 40 years old.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to cultural resources since no changes would result.

Build Alternative

Although no archaeological resources are expected to be found within the project area, construction activities such as clearing, grading, and earthmoving have the potential to uncover resources that have not been previously identified. As such, construction activities associated with the Build Alternative may result in adverse impacts associated with archaeological resources.

Avoidance, Minimization, and/or Mitigation Measures

The following measures would minimize environmental consequences and impacts and should be used during construction:

- **CR-1**—If cultural materials are discovered during construction, all earthmoving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- **CR-2**—If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities must cease in any area or nearby area suspected to overlie remains. The resident engineer, in addition to the District 6 Native American Liaison, would notify the county coroner immediately. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner would will notify the Native American Heritage Commission. The commission will then select a Most Likely Descendent and notify the resident engineer and District 6 Native American Liaison of the selection. The District 6 Native American Liaison will work with the Most Likely Descendent on the respectful treatment and disposition of the

remains. Further provisions of Public Resources Code Section 5097.98 are to be followed as applicable.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Regulatory Setting

Executive Order 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 requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order 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 and 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

This section is based on the Hydrology and Hydraulics Study Report (2012), Location Hydraulic Study that includes the Summary Floodplain Encroachment Report (2011), and the Water Quality Study Report (2011) prepared for the proposed project.

Regional Surface Hydrology

The major waterway in the vicinity of the proposed project is the Kern River that begins near Mount Whitney and flows south into Lake Isabella. The river is regulated by Isabella Dam. From Lake Isabella, the river flows southwest toward the city of Bakersfield. North of the proposed project, the river begins its flow west, and passes between the city of Bakersfield and the city of Oildale. Waterways in the area that do not flow into the Kern River are generally used for irrigation in the valley to the south of the proposed project area. The Kern River enters Buena Vista Lakebed 21 miles downstream from the Bakersfield.

Local Surface and Subsurface Hydrology

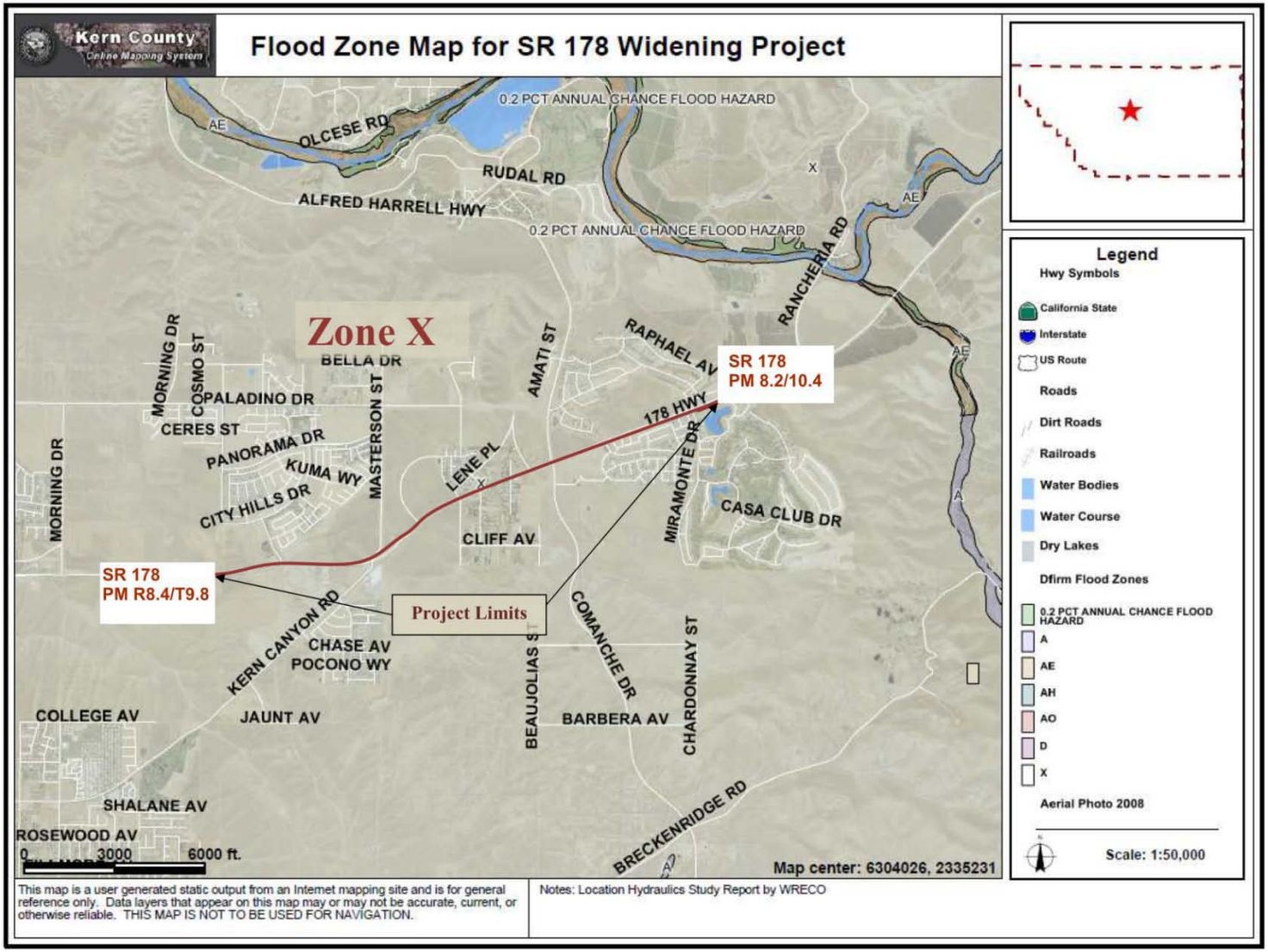
The proposed project lies within the Kern River watershed that covers over two million acres from the Sierra Nevada Mountains east of the city of Fresno to the Buena Vista Lakebed southwest of the city of Bakersfield.

The two jurisdictional drainage channels within the project limits are an ephemeral (seasonal) drainage channel and a perennial (yearly) drainage channel. The ephemeral drainage channel is about 0.40 mile southwest of the State Route 178 and Canteria Drive intersection near the western terminus of the project. The perennial drainage channel with jurisdictional wetlands is aboyut 0.30 mile east of the State Route 178 and Alfred Harrell Highway intersection near the middle of the corridor. Both drainage channels are under the jurisdiction of the United States Army Corps of Engineers, California Department of Fish and Game, and the Central Valley Regional Water Quality Control Board. The perennial drainage channel is also considered a wetland.

State Route 178 currently drains to the south as part of the Breckenridge Planned Drainage Area. The eastern portion drains north to a basin created by both natural processes and grading activities. Although there are the two jurisdictional drainage channels within the project limits, most of the runoff from the project area does not reach these water bodies and instead drains either to a nearby detention basin or adjacent grassy areas where runoff soaks into the ground.

Designated Floodplains

Based on the Federal Emergency Management Agency Flood Insurance Rate Maps (Numbers 06029C1861E, 06029C1862E, and 06029C1865E, effective September 26, 2008) and the Kern County online mapping system for flood zones, the proposed project is outside the 100- and 500-year floodplains (Zone X) (see Figure 2-8). Currently, Caltrans is not aware of any flooding issues within the project vicinity.



Source: Location Hydraulics Study Report, WRECO (2011)

Figure 2-8 Floodplain Map

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current State Route 178 configuration would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to hydrology and floodplain since no changes would result.

Build Alternative

The Build Alternative is in Zone X, a low risk flood zone, and outside the 100- and 500-year floodplains (Figure 2-8); therefore, no impacts to floodplains are anticipated. Only a small portion of the project area eventually discharges into the Kern River during major storm events. There would be no impacts to the Kern River floodplain because there is no direct encroachment on the floodplain. Additionally, the added impervious areas (pavement) would not raise the water surface elevation in the floodplain. There would be no impacts to natural and beneficial floodplain values.

Storm-water runoff would not flow to surface waters in the vicinity. Runoff from the proposed project would not directly or indirectly discharge to any Waters of the U.S., including the two jurisdictional drainage channels within the project limits. The proposed drainage facilities would discharge to basins with outlet structures that discharge to new outfalls that then discharge to Waters of the U.S. As such, the Build Alternative would not result in adverse impacts related to hydrology and floodplains since no changes would result.

The project site is not immediately downstream of a dam or levee. Isabella Dam is over 20 miles northeast of the project site. The Kern River has historically been the main source of flooding; however, with construction of Isabella Dam the Kern River flows have been regulated. Therefore, there would be a low risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam or as a result of construction of the Build Alternative.

The proposed project is inland more than 100 miles from the Pacific Ocean where no large open bodies of water are nearby that would cause a risk of loss, injury, or death involving inundation by seiche (large lake wave), tsunami (tidalwave), or mudflow related to implementation of the Build Alternative.

Based upon the analysis above, the Build Alternative would not result in adverse impacts related to hydrology or floodplain.

Construction Impacts

Construction of the Build Alternative would not adversely affect hydrology or floodplains. As described above, the project construction zone is distant from the Kern River, the only

surface water in the project vicinity with regulated floodplains. Some storm-water runoff would be discharged to nearby publicly owned waste water treatment facilities

Construction near the perennial channel at near Station 900+50 may require a temporary creek diversion. Detailed plans related to a potential temporary creek diversion would be determined during the final design phase. If required, construction scheduling would be developed to execute these construction activities during dry periods of the year to minimize potential impacts.

Avoidance, Minimization, and/or Mitigation Measures

The following measures would minimize environmental consequences and impacts and should be used during construction:

- **HF-1**—A temporary erosion and sediment control plan would be prepared and used during construction.
- **HF-2**—Best management practices would be used to control storm-water flows in the construction zone.

2.2.2 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 from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System permit. Known today as the Clean Water Act, Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the National Pollutant Discharge Elimination System permit scheme. The following are important Clean Water Act sections:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires a federal license or permit for any activity that may result in discharge into waters of the U.S. The applicant must obtain certification from the state that the discharge will comply with other provisions of the act. Section 401 is most frequently required in tandem with a Section 404 permit request (see below.)
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for the discharge (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards 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 (Municipal Separate Storm Sewer Systems).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers.

The objective of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

U.S. Army Corps of Engineers issues two types of 404 permits: Standard and General. There are two types of General permits: Regional and Nationwide. 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 authorize a variety of minor project activities with no more than minimal effects.

There are two types of Standard permits: Individual permist and Letters of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the U.S. Army Corps of Engineers Standard permits. For Standard permits, the U.S. Army Corps of Engineers decision to approve is based on compliance with U.S. Environmental Protection Agency's Section 404 (b)(1) Guidelines (U.S. Environmental Protection Agency CFR 40 Part 230), and whether permit approval is in the public interest.

The Section 404(b)(1) Guidelines were developed by the U.S. Environmental Protection Agency in conjunction with U.S. Army Corps of Engineers 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 with fewer adverse effects. The Guidelines state that U.S. Army Corps of Engineers may not issue a permit if there is a least environmentally damaging practicable alternative to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other environmental consequences.

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 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 U.S. Army Corps of Engineers, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements (see 33 CFR 320.4). A discussion of the least environmentally damaging practicable alternative 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 or groundwater of the state. The Porter-Cologne Act predates the Clean Water Act 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 Clean Water Act definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act.

The State Water Resources Control Board and Regional Water Quality Control Boards are responsible for establishing the water quality standards (objectives and beneficial uses) required by the Clean Water Act and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable Regional Water Quality Control Board Basin Plan.

States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with Clean Water Act 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 controls, the Clean Water Act requires the establishment of Total Maximum Daily Loads. Total Maximum Daily Loads specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Resources Control Board administers water rights, water pollution control, and water quality functions throughout the state. Regional Water Quality Control Boards, using planning, permitting, and enforcement authorities, are responsible for protecting beneficial uses of water resources within their regional jurisdiction.

National Pollution Discharge Elimination System Program

Municipal Separate Storm Sewer Systems

Section 402(p) of the Clean Water Act requires the issuance of National Pollution Discharge Elimination System permits for five categories of storm water discharges, including

municipal separate storm sewer systems. The U.S. Environmental Protection Agency defines a municipal separate storm sewer systems 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 designed or used for collecting or conveying storm water. The State Water Resources Control Board has identified Caltrans as an owner/operator of a municipal separate storm sewer systems by the State Water Resources Control Board. This permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The State Water Resources Control Board or the Regional Water Quality Control Board issues National Pollution Discharge Elimination System permits for five years. Permit requirements remain active until a new permit has been adopted.

The Caltrans Municipal Separate Storm Sewer Systems permit, under revision at the time of this update, contains three basic requirements:

- Caltrans must comply with the requirements of the construction general permit (see below).
- Caltrans must implement a year-round program in all parts of the state to effectively control storm-water and non-storm-water discharges.
- Caltrans storm-water discharges must meet water quality standards through implementation of permanent and temporary construction best management practices and other measures.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan to address storm-water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The Statewide Storm Water Management Plan assigns responsibilities within Caltrans 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 Statewide Storm Water Management Plan describes the minimum procedures and practices Caltrans 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 best management practices. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest Statewide Storm Water Management Plan to address storm-water runoff.

Part of and appended to the Statewide Storm Water Management Plan is the Storm Water Data Report and its associated checklists. The Storm Water Data Report documents the relevant storm water design decisions made regarding project compliance with the Municipal

Separate Storm Sewer Systems National Pollution Discharge Elimination System permit. The preliminary information in the Storm Water Data Report prepared during the Project Initiation Document phase will be reviewed, updated, confirmed, and if required, revised in the Storm Water Data Report prepared for the later phases of the project. The information contained in the Storm Water Data Report may be used to make more informed decisions regarding the selection of best management practices and recommended avoidance, minimization, or mitigation measures to address water quality impacts.

Construction General Permit

Construction General Permit (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm-water discharges from construction sites that result in a disturbed soil area of one acre or greater and/or smaller sites (less than one acre) that are part of a larger common development plan. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity, as determined by the Regional Water Quality Control Board, that results in soil disturbances of less than one acre is also subject to this Construction General Permit if there is potential for substantial water quality impairment resulting from the activity. Operators of regulated construction sites are required to develop storm-water pollution prevention plans; implement sediment, erosion, and pollution prevention control measures; and 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 of pollutants to receiving waters. Requirements apply according to the assigned risk level. For example, a Risk Level 3 (highest risk) project would require compulsory storm-water runoff pH and turbidity monitoring, plus before- 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. In accordance with the Caltrans Standard Specifications, a Water Pollution Control Plan is necessary for projects with a disturbed soil area less than one acre.

Section 401 Permitting

Under Section 401 of the Clean Water Act, any project requiring a federal license or permit that may result in discharge to a water body must obtain 401 Certification that certifies the project will be in compliance with state water-quality standards. The most common federal permits triggering 401 Certification are Clean Water Act Section 404 permits issued by U.S. Army Corps of Engineers. The 401 permit certifications are obtained from the appropriate

Regional Water Quality Control Board, dependent on the project location, and are required before U.S. Army Corps of Engineers issue a 404 permit.

In some cases the Regional Water Quality Control Board may have specific concerns with discharges associated with a project. As a result, the Regional Water Quality Control Board may issue a set of requirements known as waste discharge requirements under the State Water Code that define activities such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals used to protect or benefit water quality. Waste discharge requirements can be issued to address both permanent and temporary discharges from a project.

Local Agency Construction Activity Permitting

The proposed project is in the city of Bakersfield in Kern County. Historically, runoff from state highways is taken in by Bakersfield's drainage facilities.

Affected Environment

This section is based on the Water Quality Study Report (2011) and the Hydrology and Hydraulics Study Report (2012) prepared for the proposed project.

Surface Water

No major waterways or creeks cross the project alignment, and no water body within the project limits is listed as a 303(d)-impaired water body under the Clean Water Act. The closest major waterways are the Kern River (about 1 mile northeast of the eastern end of the project alignment) and Cottonwood Creek (about 1.25 miles east of the eastern end of the project alignment). Two drainage channels are within the project limits: an ephemeral (seasonal) drainage channel and a perennial (yearly) drainage channel. The ephemeral drainage channel is about 0.40 mile southwest of the State Route 178 and Canteria Drive intersection. The perennial drainage channel is about 0.30 mile east of the State Route 178 and Alfred Harrell Highway intersection. Both drainage channels are considered waters of the United States or 'jurisdictional' waters and are subject to regulation by the United States Army Corps of Engineers, California Department of Fish and Game, and the Central Valley Regional Water Quality Control Board.

The perennial drainage channel is also considered a wetland. The wetland helps to slow water, reducing peak flows after storm events. Slow water allows for percolation, retention of suspended sediments, and absorption of other particles and chemical pollutants. Other functions associated with the perennial channel include subsurface water recharge, nutrient cycling, sediment retention, improved water quality, and wildlife habitat. The ephemeral channel is not considered a wetland and does not have the functions or values associated with wetland features. Although some runoff from the project corridor reaches these two water

bodies, most of the runoff drains either to adjacent grassy areas where the water is absorbed or evaporates or the runoff drains to an existing detention basin. An existing detention basin is south of the State Route 178 and Park Palisades Drive intersection. An existing detention basin is north of the State Route 178 and Canteria Drive intersection.

Groundwater

The proposed project lies within the Kern River Groundwater Hydrologic Unit of the 10.5-million-acre Tulare Lake Hydrologic Basin in the southern San Joaquin Valley. This hydrologic unit is recharged almost entirely by runoff from the Sierra Nevada Mountains, carried to the basin by the Kern River. In addition, the City of Bakersfield has a supplemental recharge area identified as “2800 Acres” in the City of Bakersfield 2005 Urban Water Management Plan Update (2007). This area recharges the groundwater basin used by the City of Bakersfield for its municipal supply. Runoff from State Route 178 does not substantially contribute to the recharge of local groundwater reserves. Groundwater depth within the project area is estimated to be greater than 70 feet below ground surface.

Water Quality

No major waterways or creeks cross the project alignment, and no water bodies within the project limits are listed as a 303(d)-impaired water body under the Clean Water Act.

Storm Water Runoff

Most of the State Route 178 runoff currently sheet flows off the roadway to open land, drains to an existing detention basin, or flows to existing ditches along State Route 178. The existing drainage system consists of detention basins, inlets with open bases, cross culverts, and asphalt-concrete dikes with inlets. Although the two jurisdictional drainage channels are within the project limits, most of the runoff from the project site does not reach them. Rather, water drains to adjacent grassy areas where runoff dissipates into the ground or flows to an existing detention basin. An existing detention basin is south of the State Route 178 and Park Palisades Drive intersection. An existing detention basin is north of the State Route 178 and Canteria Drive intersection.

A representative of the Caltrans District 6 Maintenance Department was contacted on February 4, 2010 to obtain information on the existing storm-water conveyance system in the project vicinity. The representative said he was not aware of any storm-water conveyance capacity issues within the project limits. Therefore, the conveyance system design did not increase the system capacity due to known capacity problems. However, the representative also requested that the sizing of some existing conveyance facilities be upgraded to match current design standards.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current State Route 178 configuration would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to water quality or storm water runoff since no changes would result.

Build Alternative

Increased runoff from the added impervious areas (pavement) would continue to flow to the existing detention basin, plus additional detention basins and ditches that would be located to handle the roadway widening. The additional impervious areas would increase the volume and velocity (speed) of storm-water discharges. Proposed drainage improvements would be designed to accommodate increased peak storm-water runoff from the widened roadway. These efforts include using soil replacement/amendments within the detention basins to promote infiltration (absorption). For runoff that is not infiltrated, risers would be proposed within the detention basins to meter flows.

The Build Alternative also has potential to increase sediment loads in downstream flows. These impacts would be mitigated through the use of pollution prevention best management practices, erosion control measures, and a Storm Water Pollution Prevention Plan, as well as adherence to the requirements of the National Pollution Discharge Elimination System permit; Section 401 Water Quality Certification from the Central Valley Regional Water Quality Control Board; Section 404 Dredge and Fill of Jurisdictional Waters of the U.S. from the U.S. Army Corps of Engineers; and Section 1602 Streambed Alteration Agreement.

Permanent impacts to the two jurisdictional channels would be associated with the widening of State Route 178, which would result in the conversion of open channels to a transportation facility (see section 2.3.2).

Existing drainage patterns would be maintained to the maximum extent practicable. Flow rates and the amount of surface runoff would be managed by extending existing serviceable culverts, replacing existing culverts that have exceeded their design life, and constructing new detention facilities to collect and meter storm-water runoff from the roadway. Increases in velocity or volume of flow that would affect downstream flows would be mitigated through the use of detention basins that meter the release of flows. The locations of the proposed detention basins are shown in Table 2-16.

Table 2-16 Proposed Detention Basins

Proposed Facility	Location
Retention Basin	Northwest of State Route 178/Canteria Drive
Detention Basin	Southeast of State Route 178/Masterson Street
Detention Basin	Northeast of State Route 178/Masterson Street
Detention Basin	Southwest of State Route 178/Comanche Drive
Detention Basin	Northwest of State Route 178/Comanche Drive
Detention Basin	Northwest of State Route 178/Miramonte Drive

Geotechnical studies have been conducted to verify soil permeability within the proposed project limits for feasibility of infiltration basins. These studies have identified select areas where infiltration is feasible, and for areas where infiltration is not feasible. The soils can be amended to promote infiltration and flows that cannot be infiltrated will be metered. The design of the detention basins and proposed drainage facilities would be detailed during the design phase.

About 0.9 acre of additional right-of-way would be required to accommodate the new storm-water drainage facilities and expansion of existing facilities.

The Build Alternative would have no long-term demand for water and is not anticipated to deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table. The current water table is at least 70 feet below ground surface, and excavations are not expected to exceed that depth. In addition, the groundwater basin is recharged primarily from snowmelt brought to the valley by the Kern River and to some extent is recharged by City of Bakersfield groundwater management. Runoff from State Route 178 does not substantially contribute to the recharge of local groundwater reserves.

Based upon the analysis above, implementation of the Build Alternative would not result in impacts related to water quality or storm water.

Construction Impacts

In general, the primary sources of temporary water quality impacts from construction projects are from soil erosion or suspended solids being introduced into storm-water runoff from grading and other construction activities. The Build Alternative would have the potential for temporary impacts to two jurisdictional channels. Pollutants such as fuel from construction vehicles and equipment, aerially deposited lead along the shoulders of State Route 178, pesticides/herbicides associated with local agriculture, and sedimentation and erosion from vegetation clearing, grading, and construction activities could be introduced, if not properly controlled.

There is a proposed culvert extension at the perennial channel near Station 900+50 that may require a temporary creek diversion. In addition, practices commonly used for dewatering operations may include desilting basins. Sediment/desilting basins serve as temporary basins for the purpose of temporarily detaining runoff in order to allow sediment to settle out before the runoff is discharged to the nearest water or publicly owned wastewater treatment facility. The need for a temporary creek diversion would be determined during the final design phase of the proposed project.

Management of waste and runoff that is not storm-water is also essential to minimize the potential for water quality impacts on a project site. Accidental spills of petroleum hydrocarbons such as fuels and lubricating oils, concrete wastewater, and possibly sanitary wastes are also of concern during construction activities. An accidental release of these wastes can adversely affect surface water quality, vegetation, and downstream wildlife habitat.

Short-term demand for water would be limited to fugitive dust control during project construction.

Based on the analysis above, construction activities associated with the Build Alternative would not result in adverse impacts related to water quality or storm water.

Avoidance, Minimization, and/or Mitigation Measures

Construction impacts would be minimized through adherence to the requirements of the National Pollution Discharge Elimination System permit; Section 401 Water Quality Certification from the Central Valley Regional Water Quality Control Board; Section 404 Dredge and Fill of Jurisdictional Waters of the U.S. from the U.S. Army Corps of Engineers; Section 1602 Streambed Alteration Agreement; and use of best management practices, erosion control measures, and a Storm Water Pollution Prevention Plan.

The proposed project would also implement permanent erosion control measures such as mulching, hydroseeding, and netting on newly graded side slopes, rock slope protection, flared-end sections for new drainage outfalls, and dikes and ditches to convey concentrated water away from steep slopes.

2.2.3 Paleontology

Regulatory Setting

Paleontology is the study of life in past geologic time based on fossil plants and animals. A number of federal statutes such as the Antiquities Act of 1906 [16 USC 431-433], Federal-Aid Highway Act of 1960 [23 USC 305]), and the Omnibus Public Land Management Act of 2009 [16 USC 470aaa] specifically address paleontological resources, their treatment, and

funding for mitigation as a part of federally authorized or funded projects. Under California law, paleontological resources are protected by the California Environmental Quality Act.

Affected Environment

This section is based on the Paleontological Identification and Evaluation Report and Mitigation Plan (Paleontology Report) prepared for the proposed project (2011).

Paleontological resources are considered significant if they provide new data on fossil animals, distribution, evolution, or other scientifically important information. The area evaluated for paleontological resources is referred to as the Area of Potential Effects and includes all areas of ground disturbing activities associated with the proposed project. These areas generally include the limits of the state right-of-way as well as construction staging areas and utility relocation sites that would occur outside the right-of-way.

According to published regional geologic maps, the area of potential effects includes sediments of the late Miocene to Pleistocene Kern River Formation (8 million years to 11,000 years old) and sediments of Pleistocene Quaternary older alluvium (1.8 million years to 11,000 years old). There are no fossils known within the area of potential effects. However, the Kern River Formation and the Quaternary older alluvium have produced fossils. Therefore, using Caltrans standards, all formations found within the area of potential effects have high sensitivity to produce fossils.

During site reconnaissance surveys conducted on June 20, 2009, July 10, 2009, March 11-12, 2010, and November 12, 2010, the presence of sediments conducive to the preservation of fossils was confirmed for the Kern River Formation and the Quaternary older alluvium. No fossils were observed within the area of potential effects.

Kern River Formation

No fossils from the Kern River Formation are known to exist within 1 mile of the Area of Potential Effects. The Kern River Formation fossils include both extinct animals and animals that have survived to the present. Extinct fossils have been recovered from 21 Kern River Formation localities 1 to 10 miles from the Area of Potential Effects and include elephants, rhinos, camels, giant ground sloths, horses, deer, pronghorn antelope, dwarf pronghorn antelope, peccary, honey badger, dogs, foxes, cats, ringtails, weasels, rabbits, ground squirrels, gophers, mice, vulture, hawk, and giant tortoise. Most localities consist of only a few specimens.

Quaternary Older Alluvium

Fossils have been recovered from the Quaternary older alluvium within 1 mile to the north of the Area of Potential Effects east of Alfred Harrell Highway. However, no known fossils are

within the Area of Potential Effects. The fossils found within a 1 mile buffer of the Area of Potential Effects are from the Pleistocene Epoch (1.8 million to 11,000 years old) and include extinct horse, deer, pronghorn, muskrat, seven kinds of rodents, two kinds of rabbits, bat, snake, bird, lizard, turtle, frog/toad, and a freshwater bivalve (two-valved shell).

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to paleontological resources since no changes would result.

Build Alternative

According to the Paleontology Report (2011), areas of high paleontological sensitivity exist five feet below Area of Potential Effects. The vertical impacts of the project are mostly less than five feet in depth. However, building the proposed detention basins would require excavation to a maximum depth of 10 feet.

Based upon the analysis above, construction activities associated with the Build Alternative could result in adverse impacts to paleontological resources.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measure would minimize environmental consequences and impacts and should be used during construction.

During construction, paleontological monitoring would take place for any work within the project area deeper than five feet. For example, monitors would be present for the construction of drainage basins and earthwork that results in cut or fill slopes deeper than five feet. Monitoring would include, but not be limited to, the following measures (refer to Paleontological Resources: Paleontological Identification and Evaluation Report and Mitigation Plan (2011) for additional details of the mitigation plan:

- **PA-1**—A qualified principal investigator for paleontology must be retained to provide professional services. The principal investigator will meet the qualifications outlined under preparer qualifications in the Caltrans Standard Environmental Reference, Volume 1, Chapter 8, and will be responsible for implementing the mitigation plan and maintaining professional work standards. The principal investigator will have the project team include a qualified field supervisor and qualified monitors.

- **PA-2**—The resident engineer will notify the paleontologist if work will be deeper than five feet within any project area. Notification will be at 24 hours in advance. If any fossil discoveries occur when paleontological team members are not present, established procedures will be followed to protect the find by isolating the discovery with lath and flagging and moving construction excavation activities a minimum of 25 feet from the discovery.
- **PA-3**—Fossils observed during work will be treated differently depending on type and circumstance. Generally, discovery of identifiable invertebrate (shells and crustaceans) fossils requires a scientifically significant sample be collected for identification and analysis and that the location be documented. Similar procedures are followed for microvertebrates such as rodents. Current professional standards call for testing 200-pound samples (four to five full five-gallon buckets) from each location, followed by processing up to 6,000 pounds of matrix if significant fossils are recovered during testing. All locations must be documented. If larger fossils are observed, they must be evaluated to determine their condition and to determine if the fossils are sufficiently well preserved to meet preliminary significance criteria. Discovery of a bone bed or other type of fossil site containing multiple large fossils will likely require a formal stop-work order. Depending on the formations affected, additional samples may be collected that include specimens for dating analyses or materials for microfossil, botanical or pollen analyses.
- **PA-4**—The paleontologist will contact the resident engineer regarding time needed to recover fossils from unanticipated discoveries. The resident engineer will make final decisions regarding formal suspend-work orders.
- **PA-5**—Daily documentation of paleontological work is required for all members of the paleontology team. This should include observations of sediment type and distribution, observations regarding fossils, collection of fossils and other information. Locations of fossils should be recorded as precisely as possible. The use of high-resolution, resource-grade global position system (GPS) is required. The paleontologist is responsible for photographing activities, sediments and paleontological resources for documentation purposes, and filling out a Photograph Record Sheet for each digital roll. Paperwork and photographs will be submitted at the end of each week to the principal paleontologist. All documentation will be filed and maintained by the principal paleontologist and submitted to the repository along with any significant fossils upon completion of the project.
- **PA-6**—A weekly summary will be submitted to the resident engineer by e-mail or fax for all weeks in which paleontological work occurs. If fossils are recovered, additional documentation regarding laboratory work will also be incorporated into the weekly summary. These records and the field notes will be used to prepare a monthly letter

report. The monthly reports will summarize the activities of the previous period, discoveries made, progress of laboratory work, incidents, and actions taken. No later than one month after the conclusion of earthmoving, a final report will be submitted to the repository, Caltrans, and the City of Bakersfield.

- **PA-7**—The Museum of Paleontology at the University of California at Berkeley will be the repository for recovered fossils. Their policy for accepting collections requires that all project paleontology data accompany the specimens. Ownership will be transferred from Caltrans to the museum, as both are state agencies. Project funds will be allocated to pay costs for transporting, curating, and housing the collection.

2.2.4 Hazardous Waste or Materials

Regulatory Setting

Hazardous materials and hazardous waste are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste but also a variety of laws that regulate air and water quality, human health, and land use.

The primary federal laws regulating hazardous materials and waste are the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980. The purpose of the Comprehensive Environmental Response, Compensation and Liability Act, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. The Resource Conservation and Recovery Act provides for “cradle to grave” regulation of hazardous wastes. The following are other federal laws for hazardous materials and waste:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act
- Atomic Energy Act
- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976 and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

Affected Environment

This section is based on two Initial Site Assessments (2008 and 2011) completed for the State Route 178 Widening Project. The scope of the 2011 Initial Site Assessment was limited to anecdotal and visual evidence of potential hazardous waste occurrences and did not include verification sampling or analytical testing. The 2011 Initial Site Assessment consisted of a search of federal, state, and local regulatory agency databases using the Environmental Data Resources, Inc., Radius Report (December 11, 2008) in accordance with American Society Testing for Materials Standard Practice for Environmental Site Assessments (E 1527-05); a review of historical aerial photographs; Sanborn-Perris maps (fire insurance maps); United States Geological Survey maps and historical topographic maps; a site reconnaissance of the sites identified by the Environmental Data Resources, Inc. database search, plus parcels adjacent to the project corridor. A records review was conducted for files maintained by the City of Bakersfield Fire Department Prevention Services, State Water Resources Control Board GeoTracker database, Central Valley Regional Water Quality Control Board, Kern County Environmental Health Services Department, California Department of Toxic Substances Control's EnviroStor database, and the Environmental Data Resources, Inc., Radius Report. Records were reviewed between March 2009 and May 2009. A site reconnaissance was conducted on January 27, 2009 and on June 10, 2009.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current State Route 178 configuration would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to hazardous waste or materials since no changes would result.

Build Alternative

Sites of Concern

Based on the analyses performed as part of the Initial Site Assessment (2011), facilities that handle, use, and/or store hazardous waste and/or materials are located within or adjacent to the proposed project. These include an active gas station, former raceway, former airport, and oil fields. However, current conditions and available information in databases and records searched do not indicate a potential concern related to these facilities or sites. Past and current industrial or petroleum storage activities associated with these sites appear to have been and continue to be away from the project corridor and at a distance where construction activities and project operations would not affect the hazardous material locations. In addition, none of the sites are currently under investigation or undergoing remediation activities for open case incidents involving hazardous waste and/or materials.

Other Conditions of Concern

- **Aerially Deposited Lead**—According to a previous Initial Site Assessment (2008) prepared for the proposed project, aerially deposited lead surveys confirmed low-level concentrations of this contaminant along the shoulders of State Route 178. Therefore, contaminated soil is not expected to be encountered during construction of the proposed project, as the proposed widening would occur within the existing road shoulders. No further aerially deposited lead studies would be necessary for the proposed project.
- **Asbestos-Containing Material**—Construction of the proposed project is not anticipated to result in the acquisition of any road or buildings. As such, inspection and testing for asbestos-containing materials and lead-based paint are not recommended.
- **Pesticides and Herbicides**—According to a previous Initial Site Assessment (2008), pesticides and herbicides may have been employed at the project location for pest and weed control as the surrounding land historically was used for agricultural purposes and Caltrans used herbicides for weed control along State Route 178,. Soil contaminated with pesticides and herbicides may be encountered during project construction.
- **Yellow Striping and Pavement Marking Materials**—Building improvements may require removal and disposal of yellow traffic striping and pavement-marking materials (paint, thermoplastic, permanent tape, and temporary tape). Based on the age of State Route 178 (in service since 1919, added to freeway system in 1959), it is expected that yellow striping would have high concentrations of lead and would be considered a hazardous waste. Yellow paints more than three years old exceed hazardous waste criteria under Title 22, California Code of Regulations, and require disposal to a Class I disposal site.

Based on the analysis above, construction activities associated with the Build Alternative could result in adverse impacts related to hazardous materials or waste.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures would minimize environmental consequences and impacts and should be used during construction:

- **HAZ-1**—Surface and near-surface soil sampling for pesticides and herbicides should be conducted along the shoulders of State Route 178 to determine proper removal, handling, and disposal requirements. All soil sampling for pesticides and herbicides should be conducted during the Build Alternative design phase.
- **HAZ-2**—During construction of the Build Alternative, testing, removal, and disposal of any yellow traffic striping and pavement-marking materials should be conducted in accordance with the Caltrans Standard Special Provision for Hazardous Waste and Restricted Materials. Removal of yellow paint striping may require transport and disposal to a class 1 landfill. Depending on the method of removal, appropriate Standard Special Provisions shall be provided regarding handling, transport, and disposal of traffic stripe/pavement marking-generated waste.
- **HAZ-3**—The appropriate Caltrans Standard Special Provision should be edited based on the level of lead concentration found during testing and the method of removal and should indicate the appropriate testing criteria and disposal of generated waste.
- **HAZ-4**—A Lead Compliance Plan under Section 7-1.07, Lead Compliance Plan, of the Standard Specifications, will be required to address health and safety for workers during construction. Special handling, treatment, or disposal of aerially deposited lead in soils during construction activities shall be consistent with the Department of Toxic Substance Control Lead Variance (No. VO9HQSCD006) dated July 1, 2009.
- **HAZ-5**—All wooden utility poles and other treated wood waste material that will be removed or relocated as part of the project should be tested for wood treatments/preservatives such as creosote and pentachlorophenol during the Build Alternative design phase. Prior to and during construction, all treated wood waste must be properly disposed of at a wood waste disposal facility approved by California DTSC, Chapter 34, Article 1, Alternative Management Standards for Wood Treated Waste. In addition, the contractor must ensure that any personnel who come in contact with treated wood waste or contaminated soils will follow all applicable requirements under Caltrans SSP 14-010 for treated wood waste and Titles 8 and 22 Section 34, §67386.1 through §67386.12 (Alternative Management Standards for Treated Wood Waste) of the

Calfiornia Code of Regulations and be trained in the proper identification, disposal, and safe handling of treated wood waste and contaminated soils.

- **HAZ-6**—Prior to the start of construction, the contractor must prepare a plan that will include provisions for emergency response in the event that unidentified underground storage tanks, hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes are discovered during construction activities. The plan will address underground storage tank decommissioning, field screening, contaminant materials testing methods, mitigation and contaminant management requirements, and health and safety requirements for construction workers. If an unexpected release of hazardous substances is found in reportable quantities, the contractor must notify the National Response Center by calling 1-800-424-8802. Any requisite remediation will be performed in accordance with the applicable federal, state, or local regulations and requirements.
- **HAZ**-7 – Before construction, the utility company shall be notified to ensure that the locations of underground transmissions lines and facilities are marked. In addition, Underground Service Alert of Southern California shall be conacted at least two working days before subsurface excavation.

2.2.5 Air Quality

The information in this Air Quality discussion is from the Air Quality Study Report (2011). Additional information and detail are provided in that report.

Regulatory Setting

The Federal Clean Air Act as amended in 1990 is the federal law that governs air quality. The California Clean Air Act of 1988 is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency and California Air Resources Board, set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards. National Ambient Air Quality Standards and State ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns. The criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), sulfur dioxide (SO_2), and particulate matter (PM). Particulate matter is broken down for regulatory purposes into particles of 10 micrometers or smaller in diameter—PM_{10} — and particles of 2.5 micrometers and smaller in diameter—$PM_{2.5}$.

In addition, state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The National Ambient Air Quality Standards and state standards are set at a level that protects 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 within their general definition.

Federal and state air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act and the California Environmental Quality Act. In addition to this type of environmental analysis, a parallel "Conformity" requirement under the Federal Clean Air Act also applies.

Federal Clean Air Act Section 176(c) prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that are not first found to conform to the State Implementation Plan for achieving the goals of the Clean Air Act requirements related to the National Ambient Air Quality Standards. "Transportation Conformity" takes place on two levels: the regional, or planning and programming level and the project level. The proposed project must conform at both levels to be approved. Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the National Ambient Air Quality Standards, and only for the specific National Ambient Air Quality Standards that are or were violated. U.S. Environmental Protection regulations at 40 CFR 93 govern the conformity process.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas sulfur dioxide (SO_2). California has attainment or maintenance areas for all of these transportation-related "criteria pollutants" except sulfur dioxide, plus a nonattainment area for lead. However, lead is not currently required by the Federal Clean Air Act to be covered in transportation conformity analysis.

Regional conformity is based on regional transportation plans and federal transportation improvement programs that include all of the transportation projects planned for a region over a period of time: at least 20 years for the regional transportation plans and 4 years for the federal transportation improvement programs. Regional transportation plans and federal transportation improvement programs conformity is based on use of travel demand and air quality models to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that requirements of the Clean Air Act and the state improvement plan are met. If the conformity analysis is successful, the Metropolitan Planning Organization, Federal Highway Administration, and Federal Transit Administration make determinations that the regional transportation plans and federal transportation improvement programs are in conformity with the state improvement plans for achieving the goals of the Federal Clean Air Act. Otherwise, the projects in the regional transportation plans and/or federal transportation improvement programs 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 regional transportation plans and federal transportation improvement programs, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires "hot-spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide 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 U.S. Environmental Protection Agency officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by the U.S. Environmental Protection Agency and are then called "maintenance" areas. Hot-spot analysis is essentially the same, for technical purposes, as carbon monoxide or particulate matter analysis performed for the National Environmental Protection Act 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 carbon monoxide 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

An Air Quality Study Report (2011) was prepared to analyze the air quality impacts of construction and operation of the proposed project.

Regional Climate and Topography

The city of Bakersfield, situated in the extreme south end of the great San Joaquin Valley, is partially surrounded by a horseshoe-shaped rim of mountains with an open side to the northwest and the crest at an average distance of 40 miles.

The Sierra Nevada Mountains to the northeast shut out most of the cold air that flows southward over the continent during the winter. The mountains also catch and store snow, which provides irrigation water for use during the dry months. The Tehachapi Mountains, forming the southern boundary of the San Joaquin Valley, act as an obstruction to northwest wind, causing heavier precipitation on the windward slopes, high wind velocity over the ridges and, at times, continuing cloudiness in the south end of the valley after skies have cleared elsewhere. To the west are the coastal ranges; the ocean shore lies at a distance of 75 to 100 miles.

Because of the nature of the surrounding topography, there are large climatic variations within relatively short distances. These zones of variation may be classified as valley, mountain, and desert areas. The overall climate, however, is warm and semi-arid. There is only one wet season during the year, as 90 percent of all precipitation falls from October through April. Snow in the valley is infrequent, with only a trace occurring in about one year out of seven. Thunderstorms seldom occur in the valley.

Summers are cloudless, hot, and dry. Winters are mild and semi-arid, yet fairly humid. December and January are characterized by frequent fog, mostly nocturnal, which prevails when marine air is trapped in the valley by a high pressure system. Another local characteristic is the occasional warm, dry, southeast Chinook wind that spills through the Tehachapi Pass during the winter. During summer months, northwest sea breezes frequent the Bakersfield area about twice weekly. When above normal temperatures prevail for several days, the gradient builds up sufficiently to draw in cooler air from the coastal section. During prolonged periods of drought, this late afternoon breeze may carry varying amounts of dust, and thermal instability sometimes causes the dust to rise as high as 7,000 feet.

The project is in the Valley portion of Kern County within the San Joaquin Valley Air Basin. The San Joaquin Valley Air Basin is under the jurisdiction of the San Joaquin Valley Air Pollution Control District. The San Joaquin Valley Air Basin is currently designated as a state and federal nonattainment area for ozone and particulate matter ($PM_{2.5}$). The San Joaquin Valley Air Basin is designated as a state nonattainment and a federal maintenance area for PM_{10}. The Bakersfield area of the San Joaquin Valley Air Basin is designated as a maintenance area for carbon monoxide. The San Joaquin Valley Air Basin, based on federal standards (National Ambient Air Quality Standards) and the state standards (California Ambient Air Quality Standards), is designated as attainment and/or unclassified for all other pollutants. Table 2-17 summarizes the San Joaquin Valley Air Basin's attainment status.

Table 2-17 State and Federal Conformity

	Federal Conformity[1]	State Conformity[2]
O_3 8-hour	Nonattainment/Extreme[5]	Nonattainment
O_3 1-hour	No Federal Standard[6]	Nonattainment/Severe
CO	Attainment/Maintenance	Attainment/Unclassified
PM_{10}	Attainment/Maintenance[3]	Nonattainment
$PM_{2.5}$	Nonattainment[4]	Nonattainment
SO_2	Attainment/Unclassified	Attainment
NO_2	Attainment/Unclassified	Attainment
H_2S	No Federal Standard	Unclassified

[1]See 40 CFR Part 81
[2]See CCR Title 17 Sections 60200-60210
[3]On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NAAQS) and approved the PM_{10} Maintenance Plan.
[4]The Valley is designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. EPA designated the Valley as nonattainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).
[5]Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).
[6]Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. EPA had previously classified the SJVAB as extreme nonattainment for this standard. EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB. http://www.valleyair.org/aqinfo/attainment.htm

Regional Analysis

Federal clean air laws require areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, or inhalable particulate matter to develop plans, known as the State Implementation Plan, describing how they will attain the National Ambient Air Quality Standards. The 1990 amendments to the federal Clean Air Act set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the National Ambient Air Quality Standards.

State implementation plans are not single documents; rather they are compilations of new and previously submitted plans, programs (such as monitoring, modeling, permitting), district rules, state regulations, and federal controls. Many of California's State Implementation Plans rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products. State law makes California Air Resources Board the lead agency for all purposes related to the State Implementation Plan. Local air districts and other agencies, such as the Bureau of Automotive Repair, prepare State Implementation Plan elements and submit them to California Air Resources Board for review and approval. California Air Resources Board forwards State Implementation Plan revisions to U.S. Environmental Protection Agency for approval and publication in the Federal Register. The Code of Federal Regulations Title 40,

Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items included in the California State Implementation Plan. Many additional California submittals are pending U.S. Environmental Protection Agency approval.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current State Route 178 configuration would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. However, the No-Build Alternative could result in adverse impacts related to air quality since traffic congestion would increase and associated pollutant levels would also increase due to decreased vehicle speeds.

Build Alternative

Regional Air Quality Conformity

The proposed project is listed in the 2011 financially constrained Regional Transportation Plan Amendment No. 1 (project numbers KER08RTP010 and KER08RTP011) found to conform by the Kern Council of Governments in May 2011. The Federal Highway Administration and Federal Transit Administration made a regional conformity determination on June 2, 2011. The last federal approval for State Route 178 was part of the Federal Transportation Improvement Program Amendment No. 4 (project numbers KER050106 and KER050108) that followed the same timeline as the Regional Transportation Plan Amendment No. 1, receiving federal approval on June 2, 2011.

Project Level Conformity

The state and federal governments have established ambient air quality standards for six criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO_2). The proposed project is located in the Valley portion of Kern County and within the San Joaquin Valley Air Basin under the jurisdiction of the San Joaquin Valley Air Pollution Control District. The San Joaquin Valley Air Basin is currently designated as a state and federal nonattainment area for ozone (O_3) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). The San Joaquin Valley Air Basin is also designated as a state nonattainment and a federal maintenance area for particulate matter less than 10 microns in diameter (PM_{10}). The San Joaquin Valley Air Basin is designated as attainment and/or unclassified for all other pollutants. Table 2-18 shows the state and federal attainment status for each pollutant.

Table 2-18 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State [9] Standard	Federal [9] Standard	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Ozone (O_3) [2]	1 hour	0.09 ppm	--- [4]	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 (NOx) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	*Federal*: **No Federal Standard** *State*: **Severe Nonattainment**
	8 hours 8 hours (con-formity process [5])	0.070 ppm ---	0.075 ppm [6] 0.08 ppm (4th highest in 3 years)			*Federal*: **Serious Nonattainment** *State*: **Nonattainment**
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm [1] 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.	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**/Unclassified *State*: **Attainment/Unclassified**
Respirable Particulate Matter (PM_{10}) [2]	24 hours Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 --- [2]	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 aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).	*Federal*: **Attainment/Maintenance** *State*: **Nonattainment**
Fine Particulate Matter ($PM_{2.5}$) [2]	24 hours Annual 24 hours (con-formity process [5])	--- 12 µg/m^3 ---	35 µg/m^3 15.0 µg/m^3 65 µg/m^3 (4th highest in 3 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 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 (including photochemical) reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	*Federal*: **Nonattainment** *State*: **Nonattainment**

Table 2-18 State and Federal Criteria Air Pollutant Standards, Effects, and Sources (continued)

Pollutant	Averaging Time	State [9] Standard	Federal [9] Standard	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm[7] (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	*Federal*: **Attainment/Unclassified** *State*: **Attainment**
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours Annual	0.25 ppm --- 0.04 ppm ---	0.075 ppm[8] (98th percentile over 3 years) (0.5 ppm is secondary) 0.14 ppm 0.030 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**
Lead (Pb)[3]	Monthly Quarterly Rolling 3-month average	1.5 µg/m^3 --- ---	--- 1.5 µg/m^3 0.15 µg/m^3	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 gasoline may exist in soils along major roads.	*Federal*: **No Designation/Classification** *State*: **Attainment**
Sulfate	24 hours	25 µg/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.	*State Only*: **Attainment (entire state)**
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	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.	*State Only*: **Unclassified**

Table 2-18 State and Federal Criteria Air Pollutant Standards, Effects, and Sources (continued)

Pollutant	Averaging Time	State [9] Standard	Federal [9] Standard	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	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.	See particulate matter above.	*State Only*: **Unclassified**
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	*State Only*: **Unclassified (entire state)**

Based on the California ARB Air Quality Standards chart (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf). and San Joaquin Valley Air Pollution Control District, http://www.valleyair.org/aqinfo/attainment.htm
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; ppb=parts per billion (thousand million)
[1]Rounding to an integer value is not allowed for the State 8-hour CO standard. Violation occurs at or above 9.05 ppm. Violation of the Federal standard occurs at 9.5 ppm due to integer rounding.
[2]Annual PM_{10} NAAQS revoked October 2006; was 50 $\mu g/m^3$. 24-hr. $PM_{2.5}$ NAAQS tightened October 2006; was 65 $\mu g/m^3$. In 9/09 U.S. EPA began reconsidering the $PM_{2.5}$ NAAQS; the 2006 action was partially vacated by a court decision.
[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 U.S. 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 adverse health effect 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. Lead NAAQS are not required to be considered in Transportation Conformity analysis.
[4]Prior to 6/2005, the 1-hour NAAQS was 0.12 ppm. The 1-hour NAAQS is still used only in 8-hour ozone early-action compact areas. None, however, exists in California. However, emission budgets for 1-hour ozone may still be in use in some areas where 8-hour ozone emission budgets have not been developed.
[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. Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for the newer NAAQS are found adequate or SIP amendments for the newer NAAQS are completed.
[6]As of 9/16/09, U.S. EPA is reconsidering the 2008 8-hour ozone NAAQS (0.075 ppm); U.S. EPA is expected to tighten the primary NAAQS to somewhere in the range of 60-70 ppb and to add a secondary NAAQS. U.S. EPA plans to finalize reconsideration and promulgate a revised standard by August 2010.
[7]Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial nonattainment area designations should occur in 2012 with conformity requirements effective in 2013. Project-level hot spot analysis requirements, while not yet required for conformity purposes, are expected.
[8]U.S. EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010.
[9]State standards are "not to exceed" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as noted above.

There are two air quality monitoring stations located within proximity to the proposed project site. The two monitoring stations are at 1128 Golden State Highway, Bakersfield and 5558 California Avenue, Bakersfield and contain monitored data for a majority of the criteria pollutants. Table 2-19 summarizes the monitored data for the years 2007 through 2009 to illustrate the study area's general air quality trends.

Table 2-19 Ambient Air Quality Monitored Data 2007-2009

Air Pollutant	Standard/ Exceedance[2]	1128 Golden State Highway Bakersfield			5558 California Avenue Bakersfield		
		2007	2008	2009	2007	2008	2009
Carbon Monoxide (CO)	Year Coverage[1]	96%	88%	94%	NM	NM	NM
	Maximum 1-hour Concentration (ppm)	2.8	3.5	NA	NM	NM	NM
	Maximum 8-hour Concentration (ppm)	1.97	2.17	1.51	NM	NM	NM
	# Days>Federal 1-hour Standard of >35 ppm	0	0	NA	NM	NM	NM
	# Days>Federal 8-hour Standard of >9 ppm	0	0	0	NM	NM	NM
	# Days>California 8-hour Standard of >9.0 ppm	0	0	0	NM	NM	NM
Ozone (O_3)	Year Coverage[1]	98%	91%	NA	97%	95%	99%
	Maximum 1-hour Concentration (ppm)	0.127	0.115	NA	0.117	0.127	0.120
	Maximum 8-hour Concentration (ppm)	0.102	0.105	NA	0.106	0.111	0.094
	# Days>Federal 8-hour Standard of >0.075 ppm	14	21	NA	25	40	34
	# Days>California 1-hour Standard of >0.09 ppm	1	9	NA	4	15	16
	# Days>California 8-hour Standard of >0.07 ppm	26	36	NA	49	60	58
Nitrogen Dioxide (NO_2)	Year Coverage[1]	95%	95%	NA	98%	97%	NA
	Maximum 1-hour Concentration (ppm)	0.073	0.075	NA	0.072	0.083	NA
	Annual Average (ppm)	0.020	0.019	NA	0.017	0.016	NA
	# Days>California 1-hour Standard of >0.18 ppm	0	0		0	0	NA
		0	0		0		
Sulfur Dioxide (SO_2)	Year Coverage[1]	NM	NM	NM	NM	NM	NM
	Maximum 24-hour Concentration (ppm)	NM	NM	NM	NM	NM	NM
	Annual Arithmetic Mean (ppm)	NM	NM	NM	NM	NM	NM
	# Days>Federal 24-hour Standard of >0.14 ppm	NM	NM	NM	NM	NM	NM
	# Days>California 24-hour Standard of >0.04 ppm	NM	NM	NM	NM	NM	NM
Suspended Particulates (Particulate $Matter_{10}$)	Year Coverage[1]	96%	81%	93%	97%	96%	99%
	Maximum 24-hour Concentration (µg/m^3)	135.0	266.8	139.5	118.0	263.6	99.0
	#Days>Federal 24-hour Standard of>150 µg/m^3	0	1	0	0	1	0
	#Days>California 24-hour Standard of>50 µg/m^3	28	31	NA	24	31	84
	State Annual Average (µg/m^3)	NM	NM	NA	48.5	55.4	41.2
Suspended Particulates (Particulate Matter $_{2.5}$)	Year Coverage[1]	88%	90%	96%	79%	82%	90%
	Maximum 24-hour Concentration (µg/m^3)	154.0	88.7	71.5	93.7	99.3	195.5
	State Annual Average (µg/m^3)	25.2	NM	NA	22.0	NM	21.2
	#Days>Federal 24-hour Standard of>35 µg/m^3	17	13	51	49	56	46
	National Annual Average (µg/m^3)	19.9	17.9	20.0	22.0	21.9	19.0
Lead (Pb)	Maximum Monthly Concentration (µg/m^3)	NM	NM	NM	NM	NM	NM
	# Months Exceeding Federal Standard	NM	NM	NM	NM	NM	NM
	# Months Exceeding State Standard	NM	NM	NM	NM	NM	NM
Sulfates	Maximum 24-hour Concentration (µg/m^3)	NM	NM	NM	NM	NM	NM
	#Samples>California 24-hour Standard.>=25 µg/m^3	NM	NM	NM	NM	NM	NM

Sources:
California Air Resources Board: http://www.arb.ca.gov/adam/welcome.html
EPA AIRSData (for 1-Hour carbon monoxide only): http://www.epa.gov/air/data/geosel.html

NM = not measured; NA = not available
PPM = parts per million
[1]year coverage indicates how extensive monitoring was during the time of year when high pollutant concentrations were expected
[2]number of days above the standard is not necessarily the number of violations of the standard for the year
µg/m^3 = micrograms per cubic meter

Carbon Monoxide Analysis

Carbon monoxide is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death. Motor vehicles are the dominant source of carbon monoxide emissions in most areas. High carbon monoxide levels develop primarily during winter when periods of light wind combine with ground-level temperature inversions. These conditions result in reduced dispersion of vehicle emissions. In addition, motor vehicles emit more carbon monoxide in cool temperatures than in warm temperatures.

To determine the carbon monoxide conformity requirements and the project-level carbon monoxide impacts of the State Route 178 Widening Project, a carbon monoxide screening analysis was performed using the Caltrans Transportation Project-Level Carbon Monoxide Protocol (UCD-ITS-RR-97-21) (CO Protocol, last revised December 1997). According to the findings of the carbon monoxide screening analysis, implementation of the Build Alternative would not increase the percent of vehicles operating in cold-start mode since no parking facilities are proposed where a vehicle would be engaged in a cold start. However, traffic volumes would increase by 27.2 percent during the morning peak hour and 13.6 percent during the evening peak hour in 2035, the projected design year. The increase in delays at the State Route 178 and Park Palisades Drive intersection is considered minimal since this intersection would still be operating at an acceptable level of service of C.

In addition, the Build Alternative would decrease the level of service at the State Route 178 and Park Palisade Drive intersection and would not improve the level of service at the State Route 178/State Route 184/Masterson Street intersection during the evening peak hour in 2035, the projected design. Findings from the carbon monoxide microscale analysis (CALINE 4 model) performed for the State Route 178/State Route 184/Masterson Street intersection concluded the Build Alternative would not cause or contribute to a new localized exceedance of carbon monoxide ambient air quality standards, nor would it increase the frequency or severity of any existing exceedance.

Particulate Matter Analysis

Particulate matter emissions are generated by a wide variety of sources including agricultural activities, industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

The project study area is located in a federal attainment/maintenance area for particulate matter less than 10 microns in diameter (PM_{10})and a federal non-attainment area for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). The Build Alternative complies with PM_{10} control measures, as applicable, in the PM_{10} air quality plan. A $PM_{2.5}$ analysis, however, is required for this alternative.

Following the guidelines in the United States Environmental Protection Agency's "Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in Particulate $Matter_{2.5}$ and Particulate $Matter_{10}$ Nonattainment and Maintenance Areas (March 29, 2006, referred to as "PM_{10} Guidance"), a $PM_{2.5}$ hot-spot analysis should be conducted, according to qualitative guidance, only if the project has air quality concerns as defined in 40 Code of Federal Regulations 93.123(b)(1):

- New or expanded highway projects with a significant number of or significant increase in diesel vehicles.
- Projects affecting intersections that are at level of service D, E, or F with a significant number of diesel vehicles, or those that would change to level of service D, E or F because of increased traffic volumes from a significant number of diesel vehicles;
- New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.
- Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.
- Projects in or affecting locations, areas, or categories of sites identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

According to the Air Quality Study Report (2011), the projected design year 2035 annual vehicle miles traveled in the project area is predicted to be less than a 0.1 percent change between the Build Alternative and the No-Build Alternative. The Build Alternative is not expected to change the vehicle mix of gasoline and diesel vehicles within the project area and therefore, would not affect intersections operating at a level of service D, E or F because of increased traffic volumes from a substantial number of diesel vehicles.

As such, this alternative is not considered a project of air quality concern, and the United States Environmental Protection Agency has determined that such projects meet Clean Air Act conformity requirements without any further hot-spot analysis. In summary, the Build Alternative would not adversely affect vehicle mix or measurably affect regional vehicle miles traveled and therefore no particulate matter impacts are expected with this alternative.

Mobile Source Air Toxics Analysis

The Environmental Protection Agency has identified seven compounds among the national- and regional-scale cancer-risk drivers that get significant contributions from mobile sources. The compounds are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic

matter. The Federal Highway Administration considers these the priority mobile source air toxics (MSATs). Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of mobile source air toxics emissions and effects associated with the proposed project. However, even though reliable methods do not exist to accurately estimate the health impacts of mobile source air toxics at the project level, it is possible to qualitatively assess the levels of future mobile source air toxics emissions.

The qualitative assessment presented below is derived from the Federal Highway Administration's "A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives."

The Federal Highway Administration's Interim Guidance groups projects into the following categories:

- Exempt Projects and Projects with no Meaningful Potential Mobile Source Air Toxics Effects
- Projects with Low Potential Mobile Source Air Toxics Effects
- Projects with Higher Potential Mobile Source Air Toxics Effects

According to the Federal Highway Administration's Interim Guidance, examples of "Projects with Low Potential Mobile Source Air Toxics Effects" include minor widening projects and new interchanges such as those that replace a signalized intersection on a surface street or where design year traffic projections are less than 140,000 to 150,000 of the annual average daily traffic.

The Build Alternative includes the widening of State Route 178. In design year 2035, the highest projected annual-average daily traffic in the project area on State Route 178 is 69,361. In the same year, the highest projected No-Build Alternative annual-average daily traffic is 65,836. Both alternatives are substantially lower than the Federal Highway Administration criterion. Therefore, the Build Alternative meets the criteria for a "Project with Low Potential Mobile Source Air Toxics Effects."

For the Build Alternative, the amount of mobile source air toxics emitted would be proportional to vehicle miles traveled, assuming that other variables such as fleet mix are the same for each alternative. The vehicle-miles-traveled estimate for the Build Alternative is slightly lower—about 0.02 percent—than for the No-Build Alternative. This decrease in vehicle miles traveled would lead to lower mobile source air toxics emissions under the Build Alternative. This is the preferred action alternative along roadway types such as minor arterials and collector roads predicted to demonstrate a reduction in vehicle miles traveled.

Because the estimated vehicle miles traveled under the Build Alternative and No-Build Alternative are nearly the same, varying by less than 0.03 percent, it is expected that there would be no appreciable difference in overall mobile source air toxics emissions among the two alternatives. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the 2035 design year as a result of the Environmental Protection Agency's national control programs projected to reduce annual mobile source air toxics emissions by 72 percent between 1999 and 2050.

Local conditions may differ from these national projections in terms of fleet mix and turnover, vehicle-miles-traveled growth rates, and local control measures. However, the magnitude of the Environmental Protection Agency's projected reductions is so great (even after accounting for vehicle- miles-traveled growth) that mobile source air toxics emissions in the study area are likely to be lower in the future in nearly all cases.

The addition of travel lanes under the Build Alternative would move some traffic closer to nearby homes, schools, and businesses; therefore, under the Build Alternative, there may be localized areas where ambient concentrations of mobile source air toxics could be higher than under the No-Build Alternative. The localized increases in mobile source air toxics concentrations would likely be most pronounced along the expanded roadway between Vineland Road and Rancheria Road.

However, the magnitude and the duration of these potential increases, compared to the No-Build Alternative, cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific mobile source air toxics health impacts. In sum, if the highway is widened, the localized level of mobile source air toxics emissions for the Build Alternative could be higher relative to the No-Build Alternative. This increase, however, could be offset by speed increases and congestion reductions associated with lower mobile source air toxics emissions. Also, mobile source air toxics would be lower in other locations when traffic shifts away. However, on a regional basis, the Environmental Protection Agency's vehicle and fuel regulations, coupled with fleet turnover, would, over time, cause substantial reductions that in almost all cases. The effect would cause cause region-wide mobile source air toxics levels to be significantly lower than today.

Based upon the analysis above, the Build Alternative would not cause or contribute to a new localized exceedance of carbon monoxide ambient air quality standards, nor would it increase the frequency or severity of any existing exceedance. Furthermore, the Build Alternative would not adversely affect vehicle mix or regional vehicle miles traveled. As such, no particulate matter or mobile source air toxics impacts are expected with operation of this alternative. In summary, there would be no adverse impacts associated with the Build Alternative.

Construction Impacts

During construction, the Build Alternative would generate air pollutants. The exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon monoxide, suspended particulate matter, and odors. However, the largest percentage of pollutants would be windblown dust generated during excavation, grading, hauling, and various other activities. The impacts of these activities would vary each day as construction progresses. Dust and odors at some residences near the right-of-way could probably cause occasional annoyance and complaints.

Airborne Asbestos

Asbestos is a mineral fiber that can occur in rock and soil as the result of natural geologic processes. It often occurs in veins near earthquake faults in the coastal ranges and the foothills of the Sierra Nevada Mountains and other areas of California. Asbestos can also be found in a variety of construction materials used for insulation and as a fire-retardant in building and road structures. When asbestos materials are damaged or disturbed by natural weathering or human activities such as demolition activities, microscopic fibers become airborne and can be inhaled. It can cause severe health problems, including lung cancer.

The potential presence of naturally-occurring asbestos within the project footprint was evaluated based on proximity to areas likely to contain naturally-occurring asbestos as identified on the California Department of Conservation, Division of Mines and Geology's "General Location Map for Ultramafic Rocks (2002)." According to the "General Location Map for Ultramafic Rocks," the project footprint does not contain ultramafic rocks. Therefore, there would be no naturally-occurring asbestos impacts associated with constructing the Build Alternative.

In addition, under the Build Alternative, construction of the proposed project would not require any acquisition or demolition of building or road structures. Construction of the Build Alternative is not anticipated to result in any air quality impacts associated with naturally-occurring asbestos or asbestos-containing materials.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures would minimize environmental consequences and impacts and should be used during construction:

- **AQ-1**—Mitigate 20 percent of total nitrogen oxide emissions and 45 percent of total Particulate Matter$_{10}$ (PM_{10}) exhaust emissions from construction equipment greater than 50 horsepower. Emissions can be reduced by using less-polluting construction equipment with add-on controls, cleaner fuels, or newer equipment.

- **AQ-2**—Pay off-site emission reduction fees for construction activities (Rule 9510 Section 7 of the San Joaquin Valley Air Pollution Control District Regulation IX—Mobile and Indirect Sources).
- **AQ-3**—All disturbed areas, where needed, including storage piles, not being actively used for construction purposes, would be stabilized for dust emissions by applying water or chemical stabilizer/suppressant.
- **AQ-4**—All on-site unpaved roads and off-site unpaved access roads, where needed, will be stabilized for dust emissions using water or chemical stabilizer/suppressant.
- **AQ-5**—All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively control fugitive dust emissions by applying water or by presoaking.
- **AQ-6**—When materials are transported off-site, all material will be covered or effectively wetted to limit visible dust emissions. At least six inches of freeboard space will be maintained from the top of the load to the top of the container.
- **AQ-7**—All operations will limit or immediately remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions; blower devices are also expressly forbidden.)
- **AQ-8**—Within urban areas, track-out will be removed at the end of each workday, where appropriate, when it extends 50 feet or more from the site.
- **AQ-9**—Sites with 150 or more vehicle trips per day will prevent carryout and track-out.
- **AQ-10**—Traffic speeds on unpaved roads will be limited to 15 miles per hour.
- **AQ-11**—Sandbags or other erosion control measures will be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- **AQ-12**—Wheel washers will be installed for all exiting trucks or all trucks and equipment leaving the site will be washed off.
- **AQ-13**—Wind breaks will be installed at windward side(s) of construction areas.
- **AQ-14**—Excavation and grading activities will be suspended when winds exceed 20 miles per hour.
- **AQ-15**—At any one time, excavation, grading, and other construction activity areas will be limited.

- **AQ-16**—Alternative fueled or catalyst equipped diesel construction equipment will be used.
- **AQ-17**—Idling time will be minimized (e.g., 10 minute maximum).
- **AQ-18**—The hours of operation of heavy duty equipment and/or the amount of equipment in use will be limited.
- **AQ-19**—Fossil-fueled equipment will be replaced with electrically driven equivalents, provided a portable generator set does not run the equivalent machinery.
- **AQ-20**—Construction will be curtailed during periods of high ambient pollutant concentrations; this may include stopping construction activity during the peak-hour of vehicular traffic on adjacent roadways.
- **AQ-21**—Activity management will be used (e.g., rescheduling activities to reduce short-term impacts).

2.2.6 Noise

Regulatory Setting

The National Environmental Policy Act of 1969 and the California Environmental Quality Act 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 National Environmental Policy Act and the California Environmental Quality Act.

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 such measures are not feasible.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with the Federal Highway Administration (and Caltrans , as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 Code of Federal Regulations 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 contain noise abatement criteria that are used to determine when a

noise impact would occur. The noise abatement criteria differ depending on the type of land use under analysis (see Table 2-20). For example, the noise abatement criteria for residences (67 decibels) is lower than the noise abatement criteria for commercial areas (72 decibels). Table 2-20 lists the noise abatement criteria for use in the NEPA (23 CFR 772) analysis.

Table 2-20 Activity Categories and Noise Abatement Criteria

Activity Category	Noise Abatement Criteria, Hourly Noise Level, as A-Weighted Decibel (dBA) L_{eq}(h)	Description of Activities
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	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	–	Undeveloped lands.
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Figure 2-9 lists the noise levels of common activities to help readers compare the actual and predicted highway noise levels discussed in this section with common activities.

In accordance with the Caltrans Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Project (August 2006), a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 decibels or more increase) or when the future noise level with the project approaches or exceeds the noise abatement criteria. Approaching the noise abatement criteria is defined as coming within 1 decibel of the noise abatement criteria.

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 Caltrans 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. A minimum 5 decibel (dBA) reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources and safety considerations. The

reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include the following: resident's acceptance and the cost per benefited residence; the absolute noise level; build versus existing noise; environmental impacts of abatement; public and local agencies input; and newly constructed development versus development predating 1978.

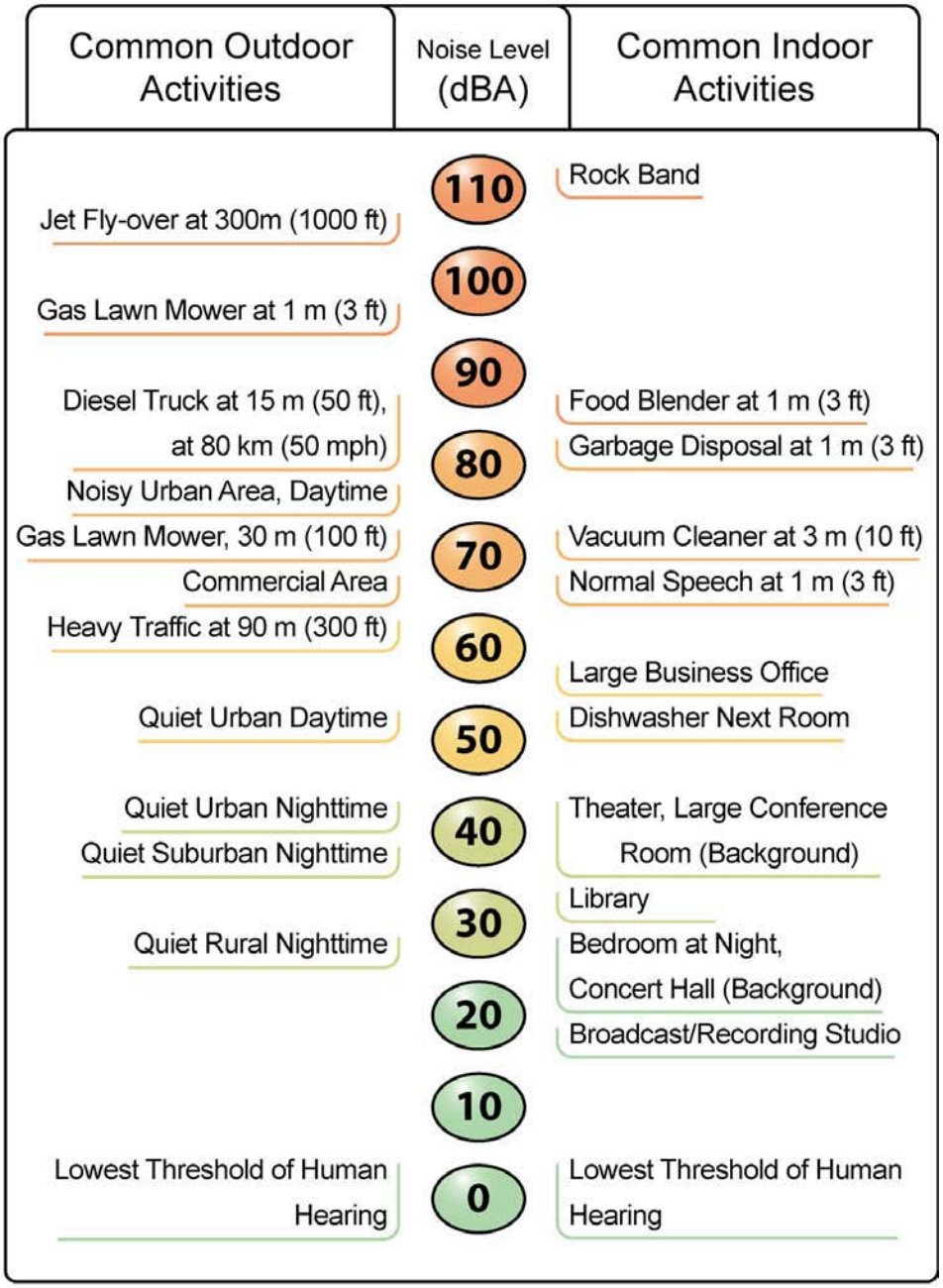


Figure 2-9 Noise Levels of Common Activities

Affected Environment

A Noise Study Report (February 2011) was prepared for the project in accordance with the Traffic Noise Analysis Protocol to identify land uses and sensitive receptors; primarily areas of frequent human use that would be affected by the proposed project and would benefit from reduced noise levels. A Noise Abatement Decision Report (February 2011) was prepared for the proposed project to estimate the construction cost for the feasible noise abatement measures identified in the Noise Study Report.

The main noise source that affects the properties in the study area is traffic on State Route 178. The project area is generally flat with minor elevation changes throughout the project area. Several properties throughout the project area have access points for driveways and local cross streets that face State Route 178.

Short-term noise measurements were taken at eight sites, all within Activity Category B land uses (residential, school, church, hospital, hotel, park and recreation areas). Based on results of the noise measurements, additional modeled sites were chosen. In addition, for areas of frequent human activities where physical measurements were not taken, sites were chosen for noise modeling. Altogether, 21 modeled sites were chosen for the proposed project.

All developed land uses were evaluated for an increase in noise levels; however, noise abatement is only considered in areas of frequent human use that would benefit from a lowered noise level. The Noise Study Report divided the areas along the project alignment into 12 areas—Area A to Area L—based on current land uses. These areas are shown on Figure 2-10. Each of these 12 areas is considered acoustically equivalent to the land uses identified as sensitive to potential noise impacts (Activity Categories B and C). Table 2-21 and Figure 2-10 provide a summary of land uses at each location.

No outdoor areas of human use occur in Areas A, B, E and F, and as such, noise abatement was not considered in these areas. The remaining areas (C, D, G, H, I, J, K and L) are primarily residential (single- and multi-family residences), commercial uses, or open space. Area D has the most commercial use: Mesa Marin Sports Complex, Maria Bonita Mexican restaurant, and a Chevron gas station.

Table 2-21 Area Description

Area	Location	Land Uses
A	North side of State Route 178, west of Canteria Road	Open space, vacant
B	South side of State Route 178, west of Canteria Road	Open space, vacant
C	North side of State Route 178, east of Canteria Road	Open space, single-family residential
D	South side of State Route 178, east of Canteria Road	Open space, commercial
E	South side of State Route 178, east of State Route 184/Masterson Street	Open space, vacant
F	South side of State Route 178, east of State Route 184/ Masterson Street and east of Valley Street	Open space, vacant
G	North side of State Route 178, east of Valley Street and west of Alfred Harrell Highway	Residential
H	South side of State Route 178, east of Valley Street and west of Alfred Harrell Highway	Residential
I	North side of State Route 178, east of Alfred Harrell Highway and west of Miramonte Drive	Residential, open space
J	South side of State Route 178, east of Alfred Harrell Highway and west of Miramonte Drive.	Residential
K	North side of State Route 178, east of Miramonte Drive and west of Rancheria Road	Residential, open space
L	South side of State Route 178, east of Miramonte Drive and west of Rancheria Road	Residential, open space

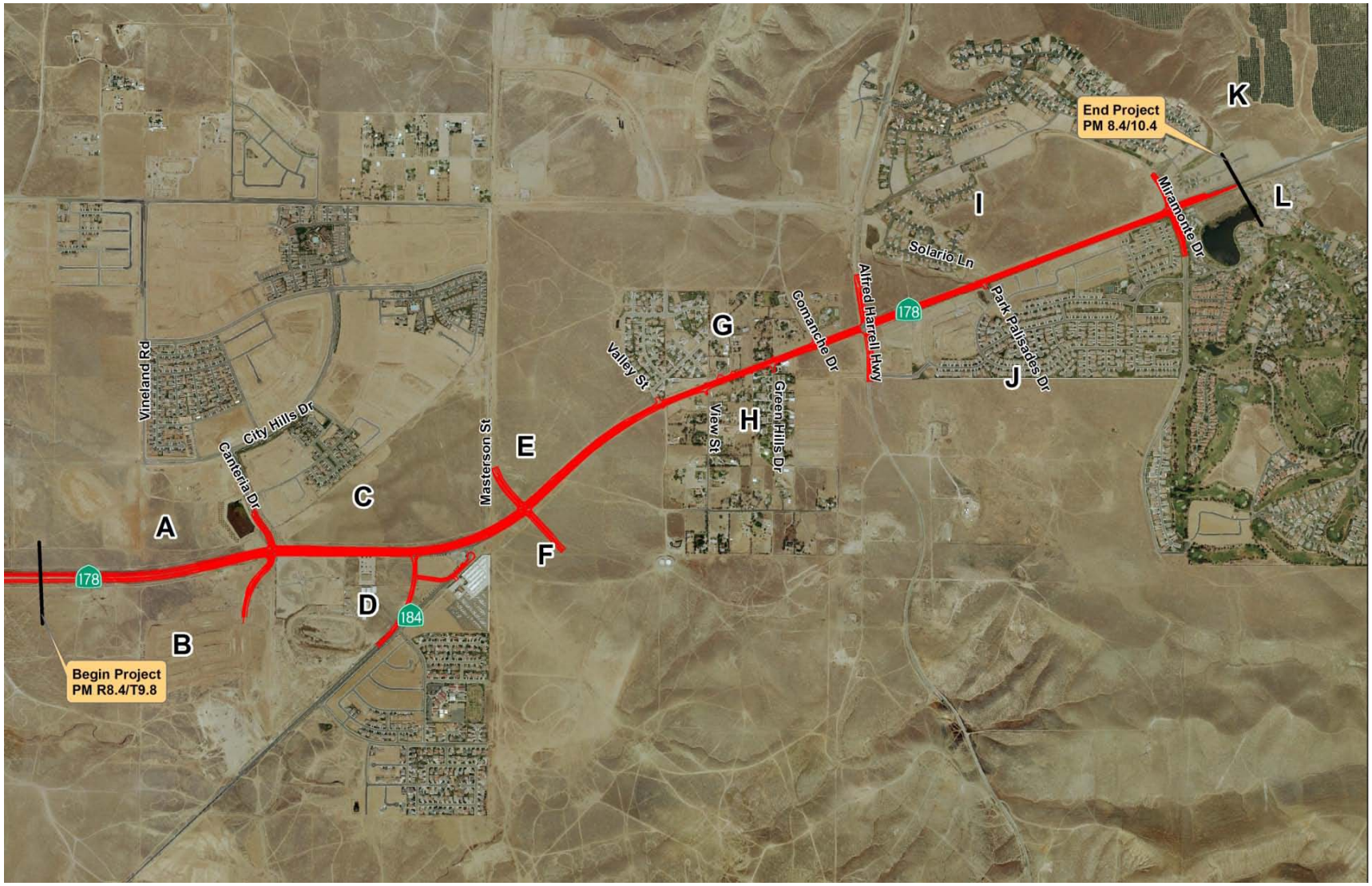


Figure 2-10 Noise Study Area

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative, the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would result in only minor increases to noise levels as shown in Table 2-22.

Build Alternative

The National Environmentally Policy Act (23 Code of Federal Regulations 772) provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. All highway projects developed in conformance with this regulation are deemed to be inline with Federal Highway Administration noise standards. A proposed federal or federal-aid highway project for the construction of a highway at 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 is considered a Type 1 project and is regulated under 23 CFR 772.5. The Build Alternative would physically alter State Route 178 by adding additional through-traffic lanes in each direction; therefore, it is a Type 1 project. As such, the Build Alternative is required to be in conformance with 23 CFR 772.5.

Table 2-22 summarizes the traffic noise modeling results for existing conditions (2008) and design-year (2035) conditions for the No-Build Alternative and Build Alternative. Predicted design-year traffic noise levels with the Build Alternative were compared to existing conditions and to design year No-Build Alternative conditions. The comparison to No-Build Alternative conditions is included in the analysis to identify traffic noise impacts under 23 CFR 772. The comparison to No-Build Alternative conditions indicates the direct effect of the Build Alternative.

In accordance with the Traffic Noise Analysis Protocol, a noise impact occurs when the future noise levels at an affected receiver exceeds existing noise levels by 12 dBA with the proposed project or when future noise levels with the proposed project approach within 1 dBA of a 66 dBA threshold or exceed the noise abatement criteria of 67 dBA for Activity Category B land uses. Based on the noise analysis results shown in Table 2-22, noise levels under the Build Alternative are only predicted to increase by 5 to 7 dBA; however, noise levels would approach or exceed the noise abatement criteria of 67 dBA for Activity Category B land uses. Traffic noise impacts are predicted to occur at seven of 29 total sites (two of the eight measured sites and five of the 21 modeled sites). The sites represent six homes and one park.

Table 2-22 Noise Impacts of Build Alternative

Receptor # and Location	Existing Noise Level (dBA)	2035 No-Build Alternative (dBA)	2035 Build Alternative (Proposed Project) (dBA)	Build Alternative with Abatement (dBA)					Is Abatement Reasonable and Feasible?
				8-ft. Wall	10-ft. Wall	12-ft. Wall	14-ft. Wall	16-ft. Wall	
M-Park, Mesa Marin Sports Complex	62	63	67	64	63	61[1]	60	59	No
ST-2, Area G 5601 Valley Street	61	62	68	61[1]	61	60	60	60	No
ST-3, Area G 12336 Highway 178	66	67	70	69	69	69	69	69	No
M-A, Area G 12017 Lene Pl	63	64	69	62[1]	60	59	58	58	No
M-B, Area H 3900 View St	61	62	66	62	61	61	60	60	No
M-C, Area H 3907 View St	61	63	67	62[1]	61	59	58	58	No
M-F, Area G 12362 Highway 178	62	63	66	62	61[1]	60	59	59	No

[1]Minimum height needed to break the line of sight between truck stack and first row receivers.
ST = Short Term Measurement Site; M = Modeling Site

Construction Impacts

Construction noise is not generally considered a substantial impact because of its temporary nature and limited night-time exposure. Construction noise represents a short-term impact on noise-sensitive receivers.

Construction of the Build Alternative would require the use of heavy equipment that could increase noise levels in the immediate project area. Examples of equipment used during construction are shown in Table 2-23.

Table 2-23 Typical Construction Equipment Noise Levels

Equipment	Maximum Noise Level (dBA at 50 feet)
Front End Loader	80
Bulldozers	85
Heavy Trucks	85
Backhoe	80
Pneumatic Tools	85
Concrete Mixer	85
Pile Driver	95
Generator	82
Paver	85

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide (2006).

Based on the types of construction activities and equipment required for the Build Alternative, noise levels at 50 feet from the center of the construction activities would generally range from 80 to 95 dBA. The average hourly noise from construction activities would be substantially lower because all the equipment would not be operating at the same time or for the entire day. Any increase in community noise levels due to construction of the Build Alternative would be temporary. Therefore, construction of the Build Alternative would not result in adverse impacts.

Avoidance, Minimization, and/or Abatement Measures

Federal guidelines under the National Environmental Policy Act (23 CFR 772) state that if a proposed project would result in noise impacts then potential noise abatement must be considered. The guidelines further state that abatement must be reasonable and feasible. These guidelines do not provide specific criteria for determining the reasonability or feasibility of abatement; therefore, it is left to each state to develop their own criteria for determining reasonable and feasible abatement. The Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. For an abatement measure to be considered feasible a minimum 5-dBA reduction in the future noise level must be achieved. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance, and the cost 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. 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.

Traffic noise impacts were predicted to approach or exceed noise levels for two of the eight measured sites and five of the 21 modeled sites. Noise abatement is not recommended for the remaining sites because noise impacts did not exceed or approach noise abatement criteria. The following is a discussion of noise abatement considered for each area where traffic noise impacts are predicted.

Area D

The traffic noise modeling results in Table 2-22 indicate that traffic noise levels at modeling site M-Park are predicted to be 67 dBA in the design year. This is a 5-dBA increase over the existing condition worst-hour traffic noise levels. These predicted noise levels are at or above

the noise abatement criteria for residential land use. Modeled site M-Park represents 1,050 feet of frontage along State Route 178, or the equivalent of 10 residences (100 feet of frontage equals one residence). Detailed modeling analysis was conducted for one barrier within Area D:

- Noise Barrier 1 (NB-1) for the Build Alternative would provide noise reduction of 6 to 8 dBA with barrier heights ranging from 12 to 16 feet for modeling site M-Park (Figure 2-11). This represents 1,050 feet of frontage along State Route 178, the equivalent of 10 residences. A 1,150-foot-long noise barrier built on the eastbound state right-of-way would wrap onto the Mesa Marin Sports Complex property line. The reasonable allowance of NB-1 is $370,000 ($37,000 per residence). The current estimated cost of the wall, based on the engineer's calculation, ranges from $690,000 to $920,000, more than the total cost allowance. Therefore, this noise barrier is not considered reasonable.

Area G

The traffic noise modeling results in Table 2-22 indicate that traffic noise levels at measurement sites ST-2, ST-3, and modeling sites M-A and M-F are predicted to be in the range of 66- to 70-dBA in the design year. This is a 4- to 7-dBA increase over the existing condition worst-hour traffic noise levels. These predicted noise levels are at or above the noise abatement criteria for residential land use. Measurement sites ST-2, ST-3, and modeling sites M-A and M-F represent a total of four residences. A detailed modeling analysis was conducted for four barriers within Area G:

- Noise Barrier 2 (NB-2) would provide noise reduction of 7- to 11-dBA with barrier heights ranging from 8 to 16 feet for measurement site ST-2 and modeling site M-A (Figure 2-12) that represent two residences. A 720-foot-long barrier would be located on the westbound State Route 178 right of way. The reasonable allowance of NB-2 ranges from $74,000 to $78,000. The current estimated cost of the wall, based on the engineer's calculation, ranges from $288,000 to $576,000, more than the total cost allowance. Therefore, this noise barrier is not considered reasonable.

- Noise Barrier 3 (NB-3) and Noise Barrier 4 (NB-4) would only provide 2-dBA of noise reduction for measurement site ST-3 (Figure 2-12) that represents one residence. A 5 dBA decrease is needed for a barrier to be feasible; therefore, noise abatement is not considered feasible in this area.

- Noise Barrier 5 (NB-5) would provide noise reduction of 5 to 7 dBA with barrier heights ranging from 10 to 16 feet for modeling site M-F (Figure 2-13). This represents one residence. A 605-foot-long barrier would be located on the westbound State Route 178

right-of-way. The reasonable allowance for NB-5 ranges from $35,000 to $37,000. The current estimated cost of the wall, based on the engineer's calculation, ranges from $302,500 to $484,000, more than the total cost allowance. Therefore, this noise barrier is not considered reasonable.

- Noise Barrier 6 (NB-6) was initially modeled with NB-5 to determine if the addition of NB-6 would provide additional noise reduction to site M-F. After modeling the two noise barriers together (NB-5 plus NB-6), NB-6 was removed from the model to see if it had provided any additional noise reduction. The results showed that the addition of NB-6 to NB-5 did not further reduce the noise levels at site M-F and therefore, did not warrant the addition of the barrier to NB-5. Based on this analysis, NB-6 was removed from further consideration.

Area H

The traffic noise modeling results in Table 2-21 indicate that traffic noise impact levels at modeling sites M-B and M-C are predicted to be in the 66- to 67-dBA range in the design year. This is a 5- to 6-dBA increase over the existing condition worst hour traffic noise levels. These predicted noise levels are at or above the noise abatement criteria for residential land use. Modeling sites M-B and M-C represent a total of two residences. Detailed modeling analysis was done for two barriers within Area H:

- Noise Barrier 7 (NB-7) would provide a 5- to 6-dBA noise reduction with barrier heights ranging from 10 to 16 feet for modeling site M-B (Figure 2-12), which represents one residence. A 735-foot-long barrier would be built on the eastbound state right-of-way. The reasonable allowance for NB-7 ranges from $35,000 to $37,000. The current estimated cost of the wall, based on the engineer's calculation, ranges from $367,500 to $588,000, more than the total cost allowance. Therefore, this noise barrier is not considered reasonable.

- Noise Barrier 8 (NB-8) would provide a 5- to 9-dBA noise reduction with barrier heights ranging from 8 to 16 feet for modeling site M-C (Figure 2-12), which represents one residence. A 565-foot-long barrier would be built on the eastbound state right-of-way. The reasonable allowance for NB-8 ranges from $35,000 to $39,000. The current estimated cost of the wall, based on the engineer's calculation, ranges from $226,000 to $452,000, more than the total cost allowance. Therefore, this noise barrier is not considered reasonable.

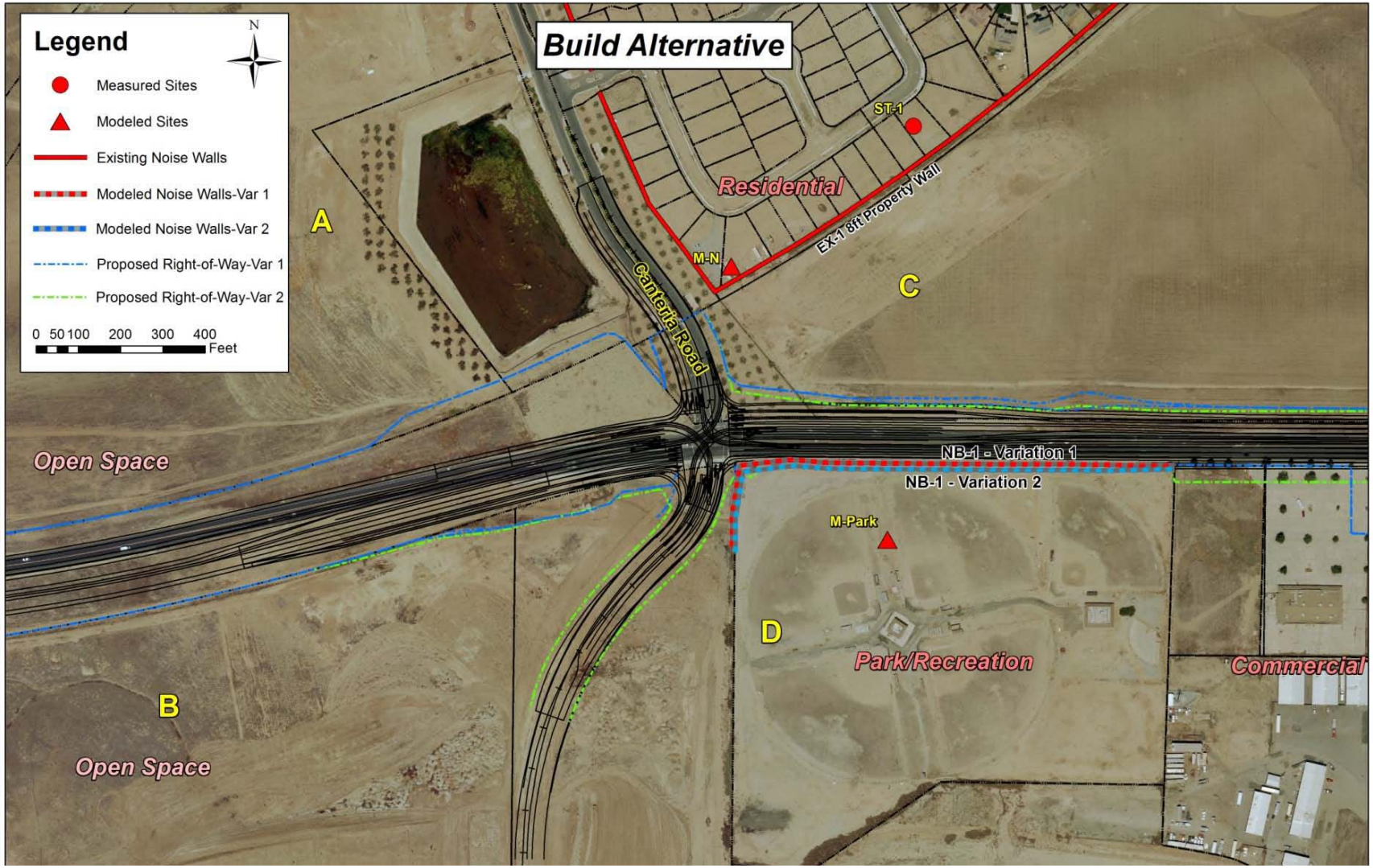


Figure 2-11 Proposed Noise Barrier Locations, Areas A through D

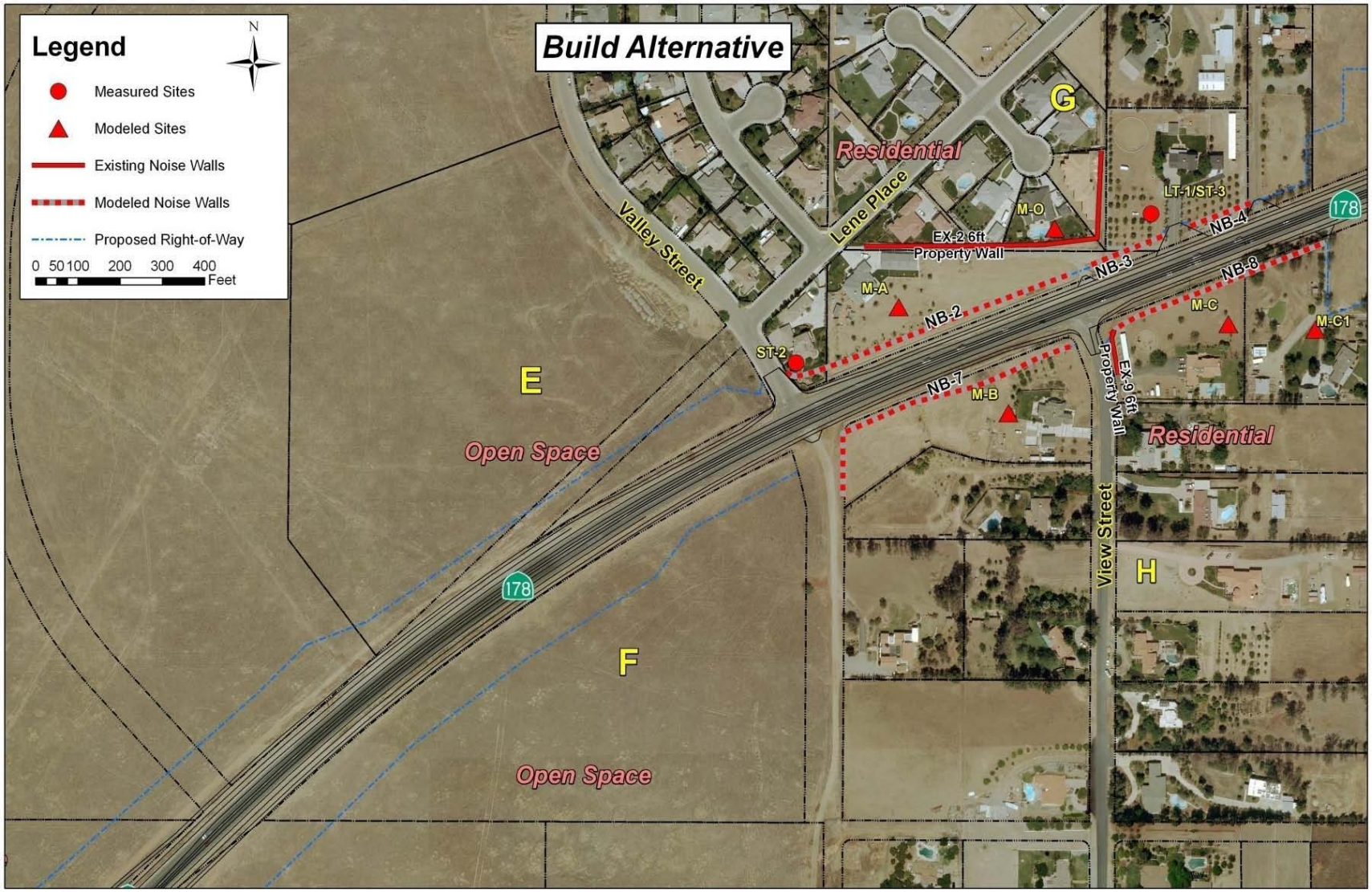


Figure 2-12 Proposed Noise Barrier Locations, Areas E through H

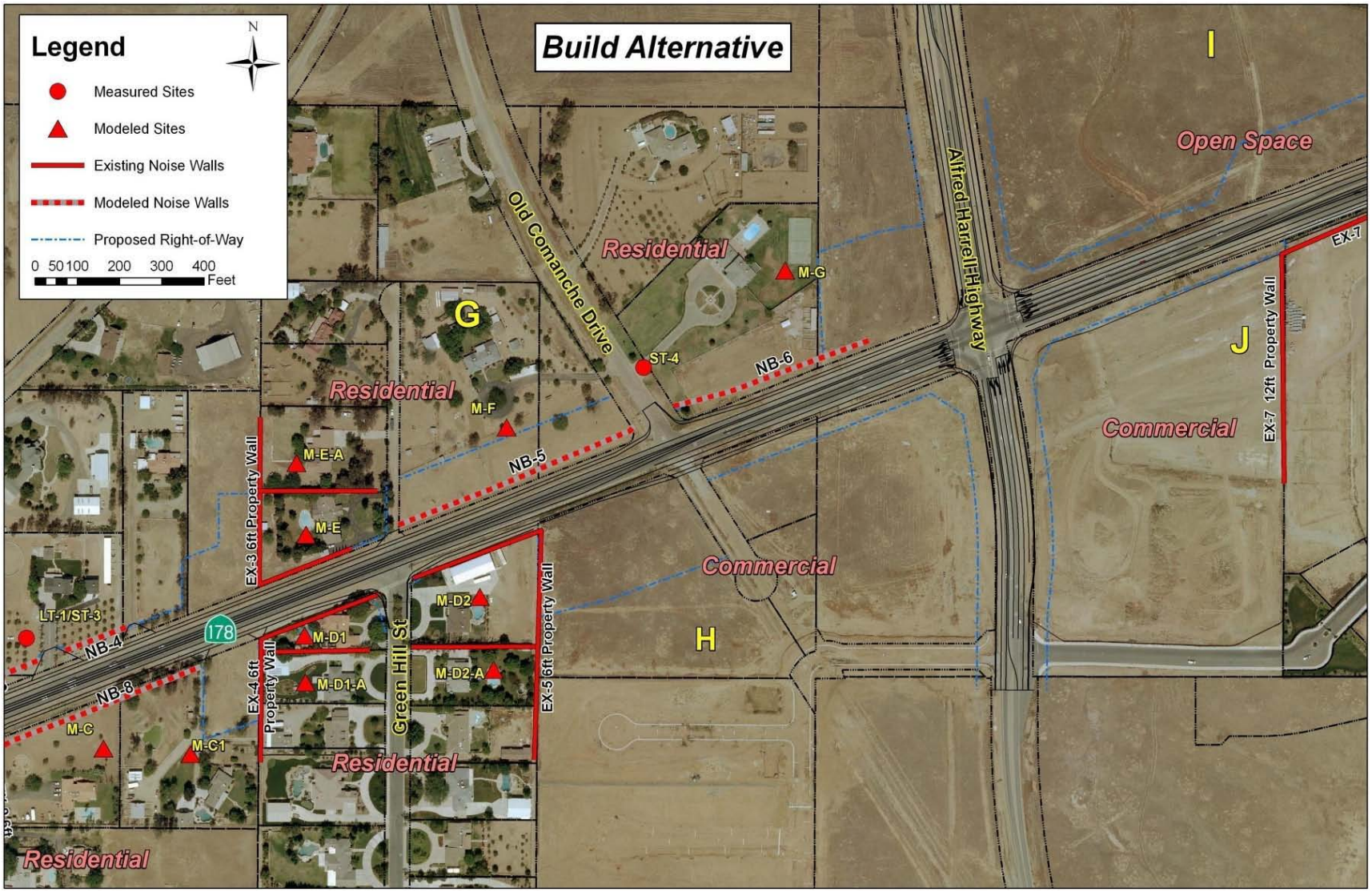


Figure 2-13 Proposed Noise Barrier Locations, Areas G through J

Table 2-24 summarizes the key information used in preliminary noise abatement decisions regarding noise barrier construction within the project limits.

Table 2-24 Noise Barrier Evaluation

Barrier	Height (feet)	Acoustically Feasible?	Break Line of Sight	Number of Benefited Residences	Total Reasonable Allowance	Estimated Construction Cost[2]	Cost Less than Allowance?
NB-1	12	Yes	Yes	10[1]	$370,000	$690,000	No
	14	Yes	Yes	10[1]	$370,000	$805,000	No
	16	Yes	Yes	10[1]	$370,000	$920,000	No
NB-2	8	Yes	Yes	2	$74,000	$288,000	No
	10	Yes	Yes	2	$78,000	$360,000	No
	12	Yes	Yes	2	$78,000	$432,000	No
	14	Yes	Yes	2	$78,000	$504,000	No
	16	Yes	Yes	2	$78,000	$576,000	No
NB-5	10	Yes	Yes	1	$35,000	$302,500	No
	12	Yes	Yes	1	$37,000	$363,000	No
	14	Yes	Yes	1	$37,000	$423,500	No
	16	Yes	Yes	1	$37,000	$484,000	No
NB-7	10	Yes	Yes	1	$35,000	$367,500	No
	12	Yes	Yes	1	$35,000	$441,000	No
	14	Yes	Yes	1	$37,000	$514,500	No
	16	Yes	Yes	1	$37,000	$588,000	No
NB-8	8	Yes	Yes	1	$35,000	$226,000	No
	10	Yes	Yes	1	$37,000	$282,500	No
	12	Yes	Yes	1	$37,000	$339,000	No
	14	Yes	Yes	1	$39,000	$495,500	No
	16	Yes	Yes	1	$39,000	$452,000	No

[1]Barrier at park based on 1,050 feet of highway frontage
[2]Estimated construction cost based on $50 per square foot.

Noise abatement was considered for each area where traffic noise impacts were predicted. Based on the noise abatement analysis done for the Build Alternative, noise barrier NB-3 and NB-4 did not meet the feasible criteria. The remaining noise barriers evaluated for the alternative met the feasible criteria, but not the reasonableness criteria. The estimated construction costs for the modeled feasible noise barriers are above the reasonable cost allowances. As a result, the feasible noise barriers do not meet the reasonableness criteria. Noise barriers cannot be recommended for the Build Alternative at this time.

The preliminary noise abatement decision is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein also may be subject to change. If pertinent parameters change substantially during final project design, the preliminary noise abatement decisions may be changed or eliminated from final project design. A final decision to construct noise abatement would be made upon completion of the proposed project design.

The following mitigation measures would minimize environmental consequences and should be used during construction:

- **N-1**—Conform to Caltrans Standard Specifications, Section 14-8.02, Sound Control Requirements. This specification requires the contractor to comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract.
- **N-2**—Conform to Caltrans Standard Special Provisions, Section S5-310, Sound Control Requirements. This provision applies to work in a residential or urban area at night. The provisions are also required if night or Sunday noise restrictions apply to the project.
- **N-3**—Each internal combustion engine used for any purpose on the job, or related to the job, would be equipped with a muffler of a type recommended by the manufacturer.
- **N-4**—No internal combustion engine would be operated on the project without manufacturer-recommended muffler.
- **N-5**—Equipment and staging areas would be as far from homes as possible.
- **N-6**—Appropriate additional noise minimization measures would be used, including relocating stationary construction equipment away from sensitive receptors, turning off idling equipment, rescheduling constriction activity, notifying adjacent residents in advance of construction, and installing acoustic barriers around stationary construction noise sources.
- **N-7**—Construction activity would be from 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 6 p.m. on weekends where building activities would be near sensitive receptors.

California Environmental Quality Act Noise Analysis

When determining whether a noise impact is significant under the California Environmental Quality Act, a comparison is made between the existing noise level (baseline) and the Build Alternative noise levels. The California Environmental Quality Act noise analysis is independent of the National Environmental Policy Act analysis, which is centered on noise abatement criteria. Under the California Environmental Quality Act, 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. The following are key considerations: the uniqueness of the setting, the sensitive nature of the noise receptor(s), the magnitude of the noise increase, the number of residences affected, and the project noise level. If a proposed project is determined to have a significant noise impact under the California Environmental Quality Act, then the Act dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

The study area is urban in nature with existing noise levels ranging from 45 to 66 dBA. The main source of noise is the existing State Route 178. Much of the project corridor is currently undeveloped with open space that is planned for future commercial and residential development. Pockets of residential development occur throughout the project corridor with most of these developments oriented away from State Route 178. The following sensitive lands uses are generally areas where lower noise levels are expected and considered beneficial: residences, schools, hotels, churches, and libraries. Sensitive receivers within the study corridor include residential neighborhoods and the sports park.

Under controlled conditions, the trained, healthy human ear is able to discern 1dBA change in noise levels. In typical noisy environments, a change in noise levels of 1 to 2 dBA are generally not perceptible. It is generally accepted that people are able to begin to detect sound level increases of 3 dBA in typical noisy environments, and that a 5 dBA increase is perceived as a distinctly noticeable increase. A 10 dBA increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy, such as doubling the volume of traffic on a highway that would result in a 3 dBA increase in sound would generally be perceived as barely detectable. For the California Environmental Quality Act noise analysis, the general consideration for a community noise environment was that a change in noise levels over 5 dBA would be noticeable and a change of less than 3 dBA would not be noticeable.

Table 2-25 compares the 2035 traffic noise levels to existing (baseline) noise levels. Based on the noise analysis results, noise levels under the Build Alternative are predicted to increase by 2 to 4 dBA for 21 of the 29 measured and modeled sites and 5 to 7 dBA for eight of the 29 sites when compared to existing conditions.

Table 2-25 Noise Impact Comparison

Receiver I.D.	Area	Land Use	# of Dwelling Units	Existing Noise Level (dBA)	2035 Build Alternative (dBA)	Increase in Noise Level over Existing (dBA)
ST-1[1]	C	Residential	12	45	49	4
M-N[1]	C	Residential	8	47	53	6
M-Park	D	Park	Equivalent to 10	62		
Build Alternative					67	5
ST-2	G	Residential	1	61	68	7
M-A	G	Residential	1	63	69	6
M-O	G	Residential	1	56	60	4
ST-3	G	Residential	1	66	70	4
M-E	G	Residential	2	58	62	4
M-E-A	G	Residential	1	52	56	4
M-F	G	Residential	1	62	66	4
ST-4	G	Open Space	0	62	66	4
M-G	G	Residential	1	57	61	4
M-B	H	Residential	1	61	66	5
M-C	H	Residential	1	61	67	6
M-C1	H	Residential	1	57	63	6
M-D1	H	Residential	1	61	64	3
M-D1-A	H	Residential	1	53	58	5
M-D2	H	Residential	1	58	61	3
M-D2-A	H	Residential	1	53	57	4
M-H	I	Residential	5	60	63	3
M-L	J	Residential	10	56	58	2
ST-5	J	Residential	15	57	59	2
M-I	J	Residential	17	57	59	2
M-M	K	Residential	2	54	57	3
M-J	K	Residential	8	55	58	3
ST-7	K	Residential	7	58	58	0
ST-6	L	Residential	10	60	62	2
ST-8	L	Residential	7	56	58	2
M-K	L	Residential	3	54	55	1

[1]-2.5dBA adjustment factor added to these sites

A portion of the noise increase, as a result of the road widening, would be from the travel lanes moved closer to sensitive receptors. However, a majority of the increase in noise would be the result of future increases in traffic levels. Future traffic increases and the resulting increase in noise levels would occur gradually over a period of about 25 years. The increased noise levels would occur during morning and evening peak commute times or about 2 to 3 hours within a 24-hour period.

Sites M-N, ST-2, M-Park, M-A, M-B, M-C, M-C1, and M-D1-A would experience a peak hour increase of at least 5 dBA (see Figure 2-11 through Figure 2-13). The eight sites represent 14 of the 120 residences represented by the measured and modeled sites. With the

exception of four residences in Area H represented by sites M-B, M-C, M-C1, and M-D1-A, the eight sites are scattered throughout the project corridor and are not concentrated within a single community. The four residences in Area H have direct access to State Route 178, eliminating the option of a continuous barrier wall to reduce noise impacts.

For the following reasons, the proposed project is not considered to have a significant effect under the California Environmental Qualtiy Act: increase in noise levels would occur over a 25-year timeframe; increased noise would only affect 14 residences scattered throughout the corridor (12 percent of residences within affected area); increased noise would only occur during the morning and evening commute hour and therefore is not expected to affect most residents (assuming most residents are on the road and not at home); and the project setting is urban in nature and is not uniquely sensitive to increased noise levels.

2.3 Biological Environment

The information in this section is based on the Natural Environment Study (September 2011) and Draft San Joaquin Kit Fox Effects Analysis Mitigation Strategy and Implementation Plan for the Thomas Roads Improvement Program prepared for the proposed project. According to this Natural Environment Study, the biological study area contains the disturbance limits for the proposed project, including such activities as cut and fill, grading, and a 100-foot-wide buffer. The term biological study area—used to analyze potential direct and indirect impacts—in this section refers to the disturbance limits, plus the buffer, defined above. In this section, region is defined as those lands that lie within the United State Geological Survey 7.5-minute quadrangle maps on which the biological study area appears, plus adjacent 7.5-minute quadrangle maps.

2.3.1 Natural Communities

This section of the environmental 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.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in Threatened and Endangered Species, section 2.3.5. Wetlands and other waters are discussed in section 2.3.2.

Affected Environment

Based on the Natural Environment Study (September 2011), two natural communities contained within the biological study area are considered sensitive by the California Department of Fish and Game (2003): valley saltbush scrub, and coastal valley and freshwater marsh. The biological study area overlaps one area where coastal valley and freshwater marsh is present. Wildlife biologists assessed the biological study area on foot and by vehicle on April 16, 2008, September 26, 2008, March 18, 2010, March 19, 2010, April 8, 2011, and September 25, 2011.

Nonnative Grassland

Nonnative grassland within the biological study area consists of annual grasses that provide sparse groundcover and are associated with numerous species of native annual wildflowers, particularly in years with favorable rainfall. Nonnative grassland provides suitable habitat for a number of special-status species, including San Joaquin kit fox, blunt-nosed leopard lizard, and burrowing owl. It also provides foraging opportunities for species such as golden eagle and white-tailed kite.

Native plant species found in the nonnative grassland community include shining peppergrass (*Lepidium nitidum*) and Menzies' fiddleneck (*Amsinckia menziesii*). Nonnative species observed include wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), foxtail chess (*B. madritensis*), and Italian ryegrass (*Lolium muitiforum*).

The nonnative grassland community occupies 174.04 acres within the biological study area and about 45.07 acres within the project area for the Build Alternative. Overall, it appears that the nonnative grassland has been subject to previous disturbances such as cultivation and disking.

Valley Saltbush Scrub and Coastal and Valley Freshwater Marsh

One isolated remnant patch of valley saltbush scrub was identified in the upland areas to the east of Alfred Harrell Highway and north of State Route 178.

The coastal and valley freshwater marsh community was found to be present in a perennial drainage channel that flows south to north across State Route 178 about 0.3 mile east of the State Route 178 and Alfred Harrell Highway intersection. The drainage is densely vegetated and dominated by broad-leafed cattail. Slow-flowing water was observed during field surveys. The water is presumed to be nuisance flows from the detention basin associated with a residential development south of the biological study area and from residential development to the northeast. The surrounding vegetation is dominated by upland vegetation and so contrasts dramatically with the vegetation in the channel.

The biological study area overlaps approximately 0.12 acre of coastal and valley freshwater marsh in Drainage A that flows south to north under State Route 178 about 0.3 mile east of Alfred Harrell Highway/Comanche Drive. The patch of valley saltbush scrub is east of Alfred Harrell Highway/Comanche Drive and occupies about 1.09 acres of the biological study area. This community provides the vegetative elements of a valley saltbush scrub (four-winged saltbush, rubber rabbitbrush); however, it is surrounded by nonnative grassland and has high levels of disturbance. The valley saltbush scrub in the biological area is a remnant community and has low functions and values.

Environmental Consequences

No-Build Alternative

The No-Build Alternative would not have any impacts to natural communities or habitat linkages in the project area because there would be no improvements to State Route 178. The following discussion summarizes impacts that would result from implementation of the Build Alternative.

Nonnative Grassland

Nonnative grassland is not considered a sensitive natural community and therefore is not discussed further here. However, this habitat type provides suitable habitat for a number of special-status species, including San Joaquin kit fox, blunt-nosed leopard lizard and burrowing owl. It also provides foraging opportunities for species such as golden eagle and white-tailed kite. The effects of lost nonnative grassland habitat are discussed further under sections 2.3.4 and 2.3.5.

Valley Saltbush Scrub and Coastal and Valley Freshwater Marsh

If sensitive plant communities cannot be fully avoided, the project would result in direct impacts to valley saltbush scrub and coastal and valley freshwater marsh. The project is expected to have direct impacts on the entire project area. The Build Alternative would thus result in removal of about 0.05 acre of coastal valley and freshwater marsh and 0.36 acre of valley saltbush scrub. The loss of 0.05 acre of freshwater marsh is considered a state jurisdictional streambed and would require compensatory mitigation. The extent of valley saltbush scrub is extremely limited in the project region and therefore impacts 0.36 acre that would require compensatory mitigation.

There could also be indirect impacts on sensitive plant communities adjacent to the project area during construction, a time when there are increased risks from pollution, degradation to adjacent areas, and habitat fragmentation. Additional potential indirect long-term impacts

include those from increased runoff, which could degrade the drainage feature that currently supports freshwater marsh habitat.

Using compensatory mitigation measures, the project is not expected to contribute to regional adverse impacts on coastal valley and freshwater marsh or valley saltbush scrub or on the species that rely on these plant communities.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures are required during construction of the Build Alternative*:*

Valley Saltbush Scrub and Coastal and Valley Freshwater Marsh

- **NC-1**—Construction employees will strictly limit their activities, vehicles, equipment, and construction materials to the project footprint, designated staging areas, and routes of travel. The construction area(s) will be fenced using orange flagging, and environmentally sensitive areas will be specified in the construction plans. Construction limits adjacent to coastal and valley freshwater marsh and valley saltbush scrub will be identified using orange environmentally sensitive area fencing. The flagging will be maintained until completion of all construction activities. Employees will be instructed that their activities are restricted to the construction areas. Access to sites will be via pre-existing access routes to the greatest extent possible. Monitoring personnel will review the project area prior to initiation of construction activities.
- **NC-2**—A Worker Environmental Awareness Program will be established and implemented prior to construction. The program will be presented by a qualified biologist. At a minimum, the program will cover the distribution of natural communities of special concern, special-status species, general behavior and ecology of these species, their sensitivity to human activities, their legal protection, the penalties for violation of state and federal laws, reporting requirements, project mitigation measures, and measures to implement in the event that this species is found during construction. A fact sheet containing this information will also be prepared and distributed. The program will be presented to all members of the construction crew prior to the start of project construction activities. New employees will receive formal, approved training prior to working onsite.
- **NC-3**—Upon completion of the orientation, employees would sign a form stating that they attended the program and understand all protection measures. These forms must be filed with Caltrans and the City of Bakersfield and would be made available to U.S. Fish and Wildlife Service and California Department of Fish and Game upon request.
- **NC-4**—Direct impacts on 0.05 acre of freshwater marsh must be mitigated adequately through a contribution to a Regional Water Quality Control Board-approved or California Department of Fish and Game-approved mitigation bank or payment of approved in-lieu

fees. A total of 0.05 acre (1:1 ratio) of credits would mitigate the impacts. This is the same mitigation recommended in the Screencheck Preliminary Wetland Delineation and Assessment Report (2011). The exact location of the compensatory mitigation will be determined during the anticipated permitting process with the California Department of Fish and Game and Regional Water Quality Control Board.

- **NC-5**—The permanent loss of 0.36 acre of valley saltbush scrub would be mitigated by participating in the Metropolitan Bakersfield Habitat Conservation Plan. Sufficient funding will be paid to the Metropolitan Bakersfield Habitat Conservation Trust Group to purchase 1.08 acres of habitat at a 3 to 1 compensation ratio).

2.3.2 Wetlands and Other Waters

The following section provides a summary of the Preliminary Wetland Delineation and Assessment Report (2011) and includes information regarding the delineation of federal jurisdictional waters and wetlands and state streambeds. The jurisdictional study area includes the project area and a 100-foot buffer.

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 (33 USC 1344) is the primary law regulating wetlands and surface waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States 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 Clean Water Act, 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 Clean Water Act.

Section 404 of the Clean Water Act 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 with oversight by the Environmental Protection Agency.

U.S. Army Corps of Engineers issues two types of 404 permits: Standard and General permits. Nationwide permits, a type of General permit, are issued to authorize 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 the U.S. Army

Corps of Engineers Standard permits. For Standard permits, the U.S. Army Corps of Engineers decision to approve is based on compliance with U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines (40 CFR Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines were developed by the U.S. EPA in conjunction with U.S. Army Corps of Engineers and allows the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative with fewer adverse effects. The guidelines state that U.S. Army Corps of Engineers may not issue a permit if there is a least environmentally damaging practicable alternative to the proposed discharge that would have fewer effects on waters of the U.S., and not have any other environmental consequences.

The executive order for the protection of wetlands (Executive Order 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency such as the Federal Highway Administration cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds 1) 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 California Department of Fish and Game, the State Water Resources Control Board, and the Regional Water Quality Control Boards. 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 the California Department of Fish and Game before beginning construction. If the California Department of Fish and Game determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement would be required. California Department of Fish and Game's 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 U.S. Army Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the California Department of Fish and Game.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The Regional Water Quality Control Boards also issue water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

Affected Environment

A jurisdictional delineation was conducted in 2009. The jurisdictional study area for the delineation was within the project area and a 100-foot buffer. Most of the jurisdictional study

area consists of State Route 178 and the adjacent land along the roadway. A number of pipes near the roadside convey storm-water flows from the road. A few swales occur throughout the site. Two drainage features—Drainage A and Drainage B—exhibit an ordinary high water mark and definable bed and banks.

Drainage A (0.16 acre) enters the jurisdictional study area via an underground pipe north of State Route 178 near the eastern boundary of the jurisdictional study area and exits nearby at the northern boundary. Drainage A then continues northwesterly where it flows into a detention basin north of the study area. Drainage A is not connected to a traditional navigable waterway or relatively permanent waterway. Drainage B (0.05 acre) starts on site in the southwestern portion of the site, south of State Route 178. The feature ends just south of the jurisdictional study area and is also not connected to a traditional navigable waterway.

Seven swales occur along State Route 178 and in other areas in the jurisdictional study area. These swales carry storm-water runoff and non-storm-water runoff (called nuisance flows, as they come from a variety of sources) flows from the adjacent development. Swales in the jurisdictional study area do not provide suitable habitat for sensitive species. No swales in the study area display an ordinary high water mark or bed and banks.

The Drainage A wetland includes functions associated with slowing the water as it exits a pipe under the road, subsurface water recharge, nutrient cycling, sediment retention, improved water quality, and wildlife habitat. The dense vegetation of the wetland helps to slow water that emerges from two pipe outlets and passes through Drainage A, reducing effects of peak flows after storm events. The slowing of water allows for percolation, retention of suspended sediments, and absorption of other particles and chemical pollutants. The wetland also provides suitable habitat for numerous bird species and at least one amphibian species. It may also provide a water source and habitat for mammal species such as coyote, deer mouse, harvest mouse, and California vole. During completed biological studies, avian species observed in Drainage A were red-winged blackbird, common yellowthroat, Virginia rail, song sparrow, and great-tailed grackle (a large black bird). These species would be expected to use the habitat for foraging and nesting opportunities. Bullfrogs, a nonnative amphibian species, were also observed. The wetland is not anticipated to sustain special-status plant or wildlife species.

The majority of the water that flows through Drainage A is first stored in a 1-acre detention basin on the south side of State Route 178. Drainage A then flows into a 4.5-acre detention basin about 1,600 feet downstream of the jurisdictional study area. Both detention basins and the portion of Drainage A not in the jurisdictional study area contain similar vegetation and would perform similar functions as the portions of Drainage A within the jurisdictional study

area. The area of Drainage A within the jurisdictional study area is 0.16 acre or about 3 percent of the total Drainage A area (5.5 acres) that provides these functions and values.

Drainge A is a potential waters of the United States and Drainage B is a potential non-wetland waters of the United States. Both channels may be subject to regulation by the U.S. Army Corps of Engineers and Regional Water Quality Control Board.

The Central Valley Regional Water Quality Control Board has concurrent jurisdiction over waters of the United States but also asserts jurisdiction over isolated waters. Drainage A and Drainage B are both isolated features and therefore subject to Regional Water Quality Control Board jurisdiction under the Porter-Cologne Act.

The California Department of Fish and Game asserts jurisdiction over streambeds and associated riparian communities and systems, including wetlands. In the jurisdictional study area, California Department of Fish and Game jurisdiction was found to include 0.01 acre and 200 linear feet of unvegetated streambed, with no abutting wetlands (Drainage B) and 0.12 acre of wetland waters (Drainage A).

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in changes to existing wetlands.

Build Alternative

One wetland (Drainage A) and one other water feature (Drainage B) are considered potential waters of the United States and Waters of the State and may fall under the jurisdiction of the U.S. Army Corps of Engineers, California Department of Fish and Game, and Regional Water Quality Control Board. The location of these features, Drainage A and Drainage B are found in Figure 2-14 and Figure 2-15.

About 0.05 acre of wetland (Drainage A) would be permanently affected by the Build Alternative from widening the existing highway to the north. The majority of Drainage B is outside the project area, with less than 1 linear foot in the project area. Therefore, 0.05 acre of Regional Water Quality Control Board waters and 0.05 acre of California Department of Fish and Game state streambeds would be affected by the Build Alternative.

In order to avoid all impacts to the wetland, the roadway near Drainage A would need to be shifted about 15 feet south, as the existing slope near the drainage is too steep to allow any widening to the north. The shift south would require demolition of an existing block wall,

which would affect several residential structures located just on the other side of the wall. The southerly shift would also result in negative impacts to the intersection of State Route 178 and Park Palisades Drive and another block wall on the west side of Park Palisades that surrounds a detention basin. Park Palisades has a short tangent length between SR 178 and its first horizontal curve nearest the highway. Shifting the roadway towards the south would further decrease the length of this tangent resulting in a less desirable tangent length. The southern shift would also affect established landscaping and trees and would require relocation of an existing curb and gutter, storm drain inlets, and sidewalk.

As currently designed, the Build Alternative proposes only four lanes of travel instead of six near Masterson. The widths of all travel lanes and shoulders are set at Caltrans minimum standards (12’ lanes, 8’ outside shoulder, 5’ inside shoulder). The curbed median near Drainage A is six feet in width. Reducing the median from six feet to four or two feet (for a minimum of 12’ from edge of travel way to edge of travel way) would negatively impact the turn lanes at Alfred Harrell Highway. The raised median is a safety feature of the project meant to prevent left turns from the side street. If the median were removed, some other barrier would need to be installed.

In consideration of the relatively minor (0.05 acre) impact to waters of the United States, in comparison to the impacts of avoidance, and the reduction in project scope, which still meets minimum design and safety standards, impacts to the existing wetland are considered to be unavoidable. In compliance with Executive Order for the Protection of Wetlands (E.O. 11990), the Department finds: 1) there is no practicable alternative to the construction proposed and 2) the proposed project includes all practicable measures to minimize harm.

The Build Alternative would also require a Section 404 Nationwide permit from the Army Corps of Engineers, to ensure that potential discharge of fill materials to waters of the United States will comply with applicable effluent limitations and water quality standards. For most projects resulting in impacts to less than 0.5 acre of non-wetland waters of the United States and/or less than 0.1 acre of wetland waters of the United States (the total of which cannot exceed 0.5 acre), use of the 404 Nation Wide Permit program is typically authorized through coordination or Pre-construction Notification with the U.S. Army Corps of Engineers. The Nation Wide Permit program was established to streamline the evaluation and approval of activities that were considered to have only minimal impacts to resources. Prior to authorization for use of any Nation Wide Permit, a 401 Water Quality Certification must be obtained from the appropriate Regional Water Quality Control Board. The California Department of Fish and Game would also require a Section 1602 Streambed Alteration Agreement for impacts to the 0.05 acres of jurisdictional streambed affected by the Build Alternative.

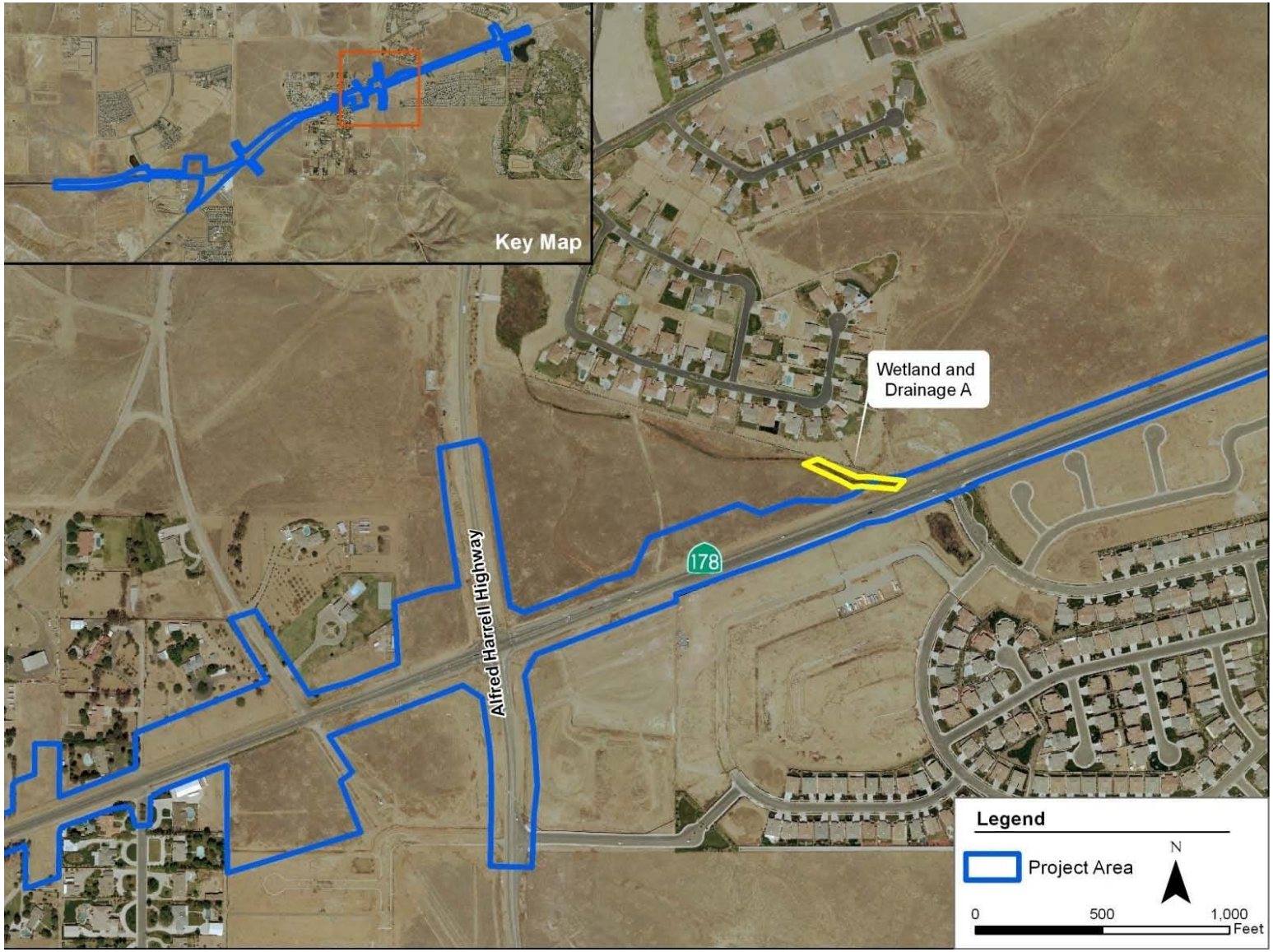


Figure 2-14 Location of Wetland and Drainage A

Figure 2-15 Location of Drainage B

Construction Impacts

Construction activities associated with the Build Alternative have the potential to result in impacts associated with wetlands. Through trampling, leaving dust on leaves and plants, and increased water turbidity, both machinery and personnel could negatively affect the vegetation and functional values of these systems. In addition, pollutants from machinery could enter these resources resulting in further decreased functional values. However, standard best management practices and permit conditions required by the Regional Water Quality Control Board, U.S. Army Corps of Engineers, and California Department of Fish and Game would minimize these potential environmental consequences and impacts. Based upon the analysis above, the Build Alternative would not result in adverse impacts related to wetlands.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measure is required during construction of the Build Alternative:

W-1—Impacts on 0.05 acre of waters of the United States can be mitigated through contributions to a U.S. Army Corps of Engineers and Regional Water Quality Control Board-approved mitigation bank or payment of approved in-lieu fees. A minimum of 0.05 acre (1 to 1 ratio) of acquired credits would mitigate the impacts on the 0.05 acre of waters of the United States.

2.3.3 Plant Species

Special-status is a general term for species that are afforded varying levels of regulatory protection. 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 or the California Endangered Species Act. Please see the Threatened and Endangered Species, section 2.3.5, in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including California Department of Fish and Game fully protected species and species of special concern, U.S. Fish and Wildlife Service candidate species, and non-listed California Native Plant Society rare and endangered plants.

Regulatory Setting

The U.S. Fish and Wildlife Service and California Department of Fish and Game 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 afforded varying levels of

regulatory protection. 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 or the California Endangered Species Act. Please see the Threatened and Endangered Species, section 2.3.5, in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including California Department of Fish and Game species of special concern, U.S. Fish and Wildlife Service candidate species, and California Native Plant Society rare and endangered plants.

The regulatory requirements for Federal Endangered Species Act can be found at 16 United States Code Section 1531, et seq. (see also 50 Code of Federal Regulations Part 402). The regulatory requirements for the California Endangered Species Act can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act found at California Fish and Game Code, Section 1900-1913 and the California Environmental Quality Act, Public Resources Code, Sections 2100-21177.

Affected Environment

A focused special-status plant survey was conducted within the plant biological study area on March 23-24, 2009, March 18-19, 2010, and April 8, 2011. A total of 27 special-status plant species have been recorded within the region. These include six threatened and/or endangered plant species discussed further in section 2.3.5, 20 nonlisted special-status plant species, and one nonlisted special-status species of local concern under the Metropolitan Bakersfield Habitat Conservation Plan. The focused surveys mentioned above confirmed all 21 nonlisted special-status plant species are absent from the plant biological study area.

The survey methodology followed the California Department of Fish and Game 2000 Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Plant Communities, California Department of Fish and Game 2009 Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities, and the California Native Plant Society Botanical Survey 2001 Guidelines. These three sets of guidelines were used to assure conduct of the proper methods for performing plant surveys, consideration of the environmental impacts that could occur as a result of the proposed project, and development of the mitigation necessary to reduce project-related impacts to special-status plants. In accordance with these plant survey requirements, focused surveys were conducted in the appropriate season and followed standard methods.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to plant species since none would be affected.

Build Alternative

Focused surveys confirmed the absence of all 21 nonlisted special-status plant species from the plant biological study area. The high level of disturbance and dominance of nonnative grasslands are the main limiting factors resulting in the absence of these plant species.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance measures are required prior to the Build Alternative construction:

- **PS-1**—Prior to construction activities, a qualified biologist will conduct a preconstruction plant survey in accordance with the most current protocols approved by U.S. Fish and Wildlife Service and California Department of Fish and Game to ensure no special-status plants will be directly affected by the project. If special status plants are observed, they will be avoided to the extent feasible. If avoidance is not feasible, conservation requirements will be discussed with U.S. Fish and Wildlife Service and California Department of Fish and Game.
- **PS-2**—Areas adjacent to the project construction area containing individual Bakersfield cactus will be designated as an environmental sensitive area and avoided by a minimum of 15 feet from the individual cactus to ensure no impacts to the plants occur during construction activities. In addition, signs will be posted identifying the area. A biological monitor will be present during all initial surface disturbance activities. In addition, the biological monitors will regularly inspect construction work, including a once daily monitoring of road construction activities. Qualified biological monitors will have authority to immediately stop any activity to avoid the take or destruction of an individual of a special-status species, if any are present.
- **PS-3**—The contractor will place storm-water drainages and culverts where they will not adversely affect areas within or around known locations of special-status plant species
- **PS-4**—A Worker Environmental Awareness Program will be established and implemented prior to construction. The program will be presented by a qualified biologist. At a minimum, the program will cover the distribution of natural communities of special concern, special-status species, general behavior and ecology of these species,

their sensitivity to human activities, their legal protection, the penalties for violation of state and federal laws, reporting requirements, project mitigation measures, and measures to implement in the event that this species is found during construction. A fact sheet containing this information will also be prepared and distributed. The program will be presented to all members of the construction crew prior to the start of project construction activities. New employees will receive formal, approved training prior to working on-site. Upon completion of the Worker Environmental Awareness Program, employees would sign a form stating that they attended the program and understand all protection measures. These forms would be filed with Caltrans and the City of Bakersfield and would be made available to U.S. Fish and Wildlife Service and California Department of Fish and Game upon request.

2.3.4 Animal Species

This section discusses potential impacts and permit requirements for wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in section 2.3.5. All other special-status animal species are discussed here, including California Department of Fish and Game fully protected species and species of special concern, and the U.S. Fish and Wildlife Service or National Oceanic and Atmospheric Fisheries Service candidate species.

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration Fisheries, and the California Department of Fish and Game are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in section 2.3.5.

The following federal laws and regulations pertain to wildlife:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

The following state laws and regulations pertain to wildlife:

- California Environmental Quality Act
- Sections 1600–1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

Affected Environment

The biological study area supports suitable habitat for a variety of special-status wildlife species. Based on the Natural Environment Study (September 2011), 25 special-status wildlife species were determined to have the potential to occur within the biological study area. A total of 11 endangered and/or threatened animal species are known to occur within the region (see section 2.3.5). Of the 10 species of nonlisted special-status animals, four species have been observed or have a moderate or greater potential for occurrence. Two are California Species of Special Concern—burrowing owl and loggerhead shrike—and two are California Fully Protected Species—white-tailed kite and golden eagle. The remaining species were not identified within the biological study and are not addressed further. Of the California Special Status Species, only two species—burrowing owl and loggerhead shrike—have been observed or have a moderate or greater potential for occurrence within the biological study area.

California Species of Special Concern

Burrowing Owl

The burrowing owl *(Athene cunicularia)* is a California species of special concern. It occurs in short-grass prairies, grasslands, lowland scrub, agricultural lands (particularly rangelands), prairies, coastal dunes, and desert floors. Burrowing owls also may use golf courses, cemeteries, road allowances in cities, airports, vacant lots in residential areas, university campuses, fairgrounds, abandoned buildings, and irrigation ditches. The presence of recently excavated burrows is a primary habitat requirement for nesting. The owl may also use pipes, culverts, nest boxes, and other cavities where burrows are scarce. One burrow is typically selected for use as the nest; however, satellite burrows are usually found in the immediate vicinity of the nest burrow in the defended territory of the owl. Burrowing owls are generally monogamous, although new mates often appear when one of the pair dies or when the pair divorces.

Although open areas with no vegetation or short vegetation are critical for nesting, there is some evidence that burrowing owls prefer a vegetation mosaic where nesting habitat is interspersed with taller vegetation for hunting or cover. However, the primary requirement for suitable burrowing owl foraging habitat appears to be low vegetation cover that allows visibility and access to prey.

Although numerous potentially suitable burrows were found throughout the survey area, only one burrowing owl territory was found 337 feet from the project area. This territory was identified by the presence of numerous feathers, fresh whitewash, and fresh pellets. This burrow was originally detected during the jurisdictional delineation site visit on August 14,

2008, but no owls were observed at the burrow. During the focused burrowing owl survey, this burrow was observed from a distance from various vantage points to determine whether owls were present at the burrow. Although no burrowing owls were observed, the presence of fresh sign is diagnostic of recent occupation; therefore, the burrow is considered occupied. This was the only burrowing owl territory found during the focused survey.

Loggerhead Shrike

Loggerhead shrike *(Lanius ludovicianus)* is found in a variety of habitats, including broken woodlands, savanna, Joshua tree, riparian woodlands, and desert oasis, scrub, and oasis habitats. The loggerhead shrike uses open country and perches for hunting. Nesting habitat requires dense shrubs and brush. During a April 16, 2008 survey, a single loggerhead shrike was observed foraging within the western portion of the biological study area. The biological study area provides very limited nesting habitat: two isolated patches of valley saltbush scrub. The shrubs within this habitat may not provide the vegetative structure needed to support a loggerhead shrike nest. It is more likely that the individual sighted uses nesting habitat outside the biological study area and moved onto the biological study area for foraging opportunities. Due to observation, the species is considered present in the area.

California Fully Protected Species

White-Tailed Kite

The white-tailed kite *(Elanus leucurus)* is a California Fully Protected species that inhabits low elevations, open grasslands, savannah-like habitats, agricultural areas, wetlands, and oak woodlands. Nonnative grasslands within the biological study area provide suitable habitat for foraging. In August 2008 and June 2009, a single white-tailed kite was observed foraging near the biological study area. Potential nesting habitat for this species does not exist within the biological study area due to the absence of riparian forest or riparian trees. The California Natural Diversity Database (2011) has no record of this species within the vicinity of the biological study area.

Golden Eagle

The golden eagle *(Aquila chrysaetos)* is a California Fully Protected species that nests primarily in rugged mountainous country in large trees and on secluded cliffs with overhanging ledges. Large expanses are required for foraging. The biological study area does not contain any suitable nesting habitat, but the nonnative grasslands provides suitable habitat for foraging. On a number of occasions, a pair of golden eagles were observed foraging within the western extent of the biological study area. The California Natural Diversity Database (2011) has no record of this species within the vicinity of the biological study area.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to animal species since none would be affected.

Build Alternative

Burrowing Owl

The Build Alternative would result in a loss of 79.58 acres of habitat, (34.15 acres of ruderal habitat, 45.07 acres of nonnative grassland, and 0.36 acre of valley saltbush scrub. With increased traffic and a wider roadway under the Build Alternative, vehicle strikes could occur.

Loggerhead Shrike

The Build Alternative would have direct impacts on 45.07 acres of nonnative grassland and 0.36 acre of valley saltbush scrub habitat. The Build Alternative would have no direct impacts on nesting loggerhead shrike.

White-Tailed Kite

The Build Alternative would have direct impacts on 45.07 acres of nonnative grassland. The Build Alternative would have no impacts on potential nesting habitat for white-tailed kite as no suitable nesting habitat exists within the biological study area. With increased traffic and a widened roadway, there is the potential for indirect impacts such as increased mortality from vehicle strikes.

Golden Eagle

The Build Alternative would have direct impacts on 45.07 acres of nonnative grassland. The Build Alternative would have no impacts on potential nesting habitat for the golden eagle as no suitable nesting habitat exists within the biological study area. With increased traffic and a widened roadway, there is potential for indirect impacts such as increased mortality from vehicle strikes.

Construction Impacts

Burrowing Owl

During construction activities, the Build Alternative has potential to cause direct mortality or harm to the western burrowing owl, if this species is present during grading or earthmoving work. Potentially, project construction could inadvertently compact occupied burrows. The Build Alternative would directly affect a total of 79.85 acres (34.15 acres of ruderal habitat,

45.07 acres of nonnative grassland, and 0.36 acre of valley saltbush scrub that could be used bythe burrowing owl for foraging and nesting.

Construction of the Build Alternative may interfere with nesting activities, if nests within 250 feet of construction activities. Indirect impacts such as noise or ground disturbance within the biological study area may cause nest failure or abandonment. These actions could result in direct loss (or take) of a western burrowing owl if construction activities disrupt the breeding cycle of this special-status species.

Avoidance, Minimization, and/or Mitigation Measures

California Species of Special Concern

Avoidance, minimization and/or mitigation measures are required for the two observed California Species of Special Concern:

Burrowing Owl

- **AS-1**—The permanent loss of 79.85 acres (34.15 acres of Ruderal habitat, 45.07 acres of nonnative grassland, and 0.36 acre of valley saltbush scrub) under the Build Alternative associated with burrowing owl is considered a direct impact. Implementation of compensatory mitigation associated with the Metropolitan Bakersfield Habitat Conservation Plan (a minimum of 3 to 1 acres of credit for permanent habitat lost and a 1 to 1 acre of credit for temporary loss of habitat) will mitigate the loss of habitat.
- **AS-2**—A qualified biologist, using the California Department of Fish and Game (1995) and California Burrowing Owl Consortium (1993) guidelines, will perform burrowing owl surveys 30 days prior to ground disturbance. The preconstruction survey will include the project area and a 300-foot buffer if between February 1 and August 31 (nesting season) or a 100-foot buffer if outside this window.
- **AS-3**—If burrowing owls are observed during the preconstruction survey, they must be avoided by a minimum of 160 feet during the non-breeding season (September 1 through January 31) or a minimum 250 feet during the breeding season (February 1 through September 15) and then relocated once the nesting season is complete, with coordination from the wildlife agencies particularly California Department of Fish and Game.
- **AS-4**—On-site passive relocation by a qualified biologist will take place if occupied burrows cannot be avoided. If nesting burrowing owls are found, either (1) construction disturbance cannot occur within 250 feet of the active burrow(s) until it is confirmed by a qualified ornithologist that the pair is no longer nesting and the young (if present) are independently foraging or (2) active relocation by a properly permitted biologist is

performed, with concurrence from the California Department of Fish and Game and U.S. Fish and Wildlife Service.

Loggerhead Shrike

- **AS-5**—The potential for loggerhead shrike nesting is low, but it is recommended that precautions be taken to prevent the destruction of a nest. Clearing and grubbing of natural areas will take place outside the active nesting period (February 1 through September 15). If clearing and grubbing are required during this period, a preconstruction nesting bird survey will be required no more than 7 days prior to vegetation removal. Any documented active nests will require a 250-foot buffer where no construction activity will be permitted until the nesting is complete (failed or young have fledged). The radius of the buffer area may be reduced based on California Department of Fish and Game approval for the nesting species. A worker Environmental Awareness Program will also be established and implemented prior to construction.
- **AS-6**—Proposed mitigation for San Joaquin kit fox and blunt-nosed leopard lizard will serve to offset effects to the loggerhead shrike. Compensatory mitigation will not be needed if nesting habitat is avoided or construction is done outside the nesting season.

Golden Eagle and White-tailed Kite

Mitigation proposed for the San Joaquin kit fox and blunt-nosed leopard lizard will also offset effects to suitable foraging habitat for the golden eagle and white-tailed kite.

2.3.5 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the federal Endangered Species Act (16 USC Section 1531, et seq.) (see also 50 CFR Part 402). This act and subsequent 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 are required to consult with the US Fish and Wildlife Service and the National Marine 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 is a Biological Opinion or an Incidental Take statement. Section 3 of the federal Endangered Species Act defines take as to “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: California Endangered Species Act, California Fish and Game Code, Section 2050, et seq. The California Endangered Species Act 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 Game is the agency responsible for implementing the California Endangered Species Act. 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 to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

The California Endangered Species Act allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by California Department of Fish and Game. For projects requiring a Biological Opinion under Section 7 of the Federal Endangered Species Act, California Department of Fish and Game may also authorize impacts to California endangered 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 (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 areas.

Affected Environment

Based on the Natural Environment Study (September 2011), 6 endangered and/or threatened plant and 11 endangered and/or threatened animal species are known to occur within the region. San Joaquin kit fox has been confirmed present, and the blunt-nosed leopard lizard has a moderate potential for occurrence. The remaining animal species were determined to have low to no potential to occur within the biological study area.

The biological study area contains one predominant plant community: nonnative grassland. The study area, however, is not ideally suited to the six endangered and/or threatened plant species: Bakersfield cactus, Bakersfield smallscale, California jewel flower, San Joaquin adobe sunburst, San Joaquin woollythreads, or striped adobe-lily. The valley saltbush scrub also provides a small amount of suitable habitat within the assessment study area. The only species documented within 1 mile of the plant study area is the Bakersfield cactus west of

Morning Drive. The remaining plant species have not been documented within a 5-mile radius of the plant study area and none of the listed plant species were observed during the focused plant surveys completed in March 2009, March 2011, and April 2011.

Of the 11 endangered and/or threatened animal species San Joaquin kit fox has been confirmed as present and blunt-nosed leopard lizard has a moderate potential for occurrence. There is a low potential for Swainson's hawk. The following eight species would not occur, based on a lack of suitable habitat in the study area or that the project site is out of the current range for these species: California red-legged frog, giant garter snake, Nelson's antelope ground squirrel, Tipton kangaroo rat, vernal pool fairy shrimp, Valley elderberry longhorn beetle, Delta smelt, and Kern Canyon slender salamander. The nine species with a low or no potential for occurrence are not addressed further.

Blunt-Nosed Leopard Lizard

The blunt-nosed leopard lizard is listed as endangered under the federal Endangered Species Act of 1973 and California Endangered Species Act. It is a state fully-protected species, so take authority cannot be issued by the state.

The blunt-nosed leopard lizard has been historically located in the vicinity of the biological study area; there are three historical California Natural Diversity Database (2011) records of the lizard within 2 miles of the project area. The Metropolitan Bakersfield Habitat Conservation Plan (1994) also notes a blunt-nosed leopard lizard record about 2 miles north of the biological study area. During the field visit on April 16, 2008 and September 26, 2008, suitable habitat for blunt-nosed leopard lizard was identified within the biological study area.

San Joaquin Kit Fox

The San Joaquin kit fox is federally listed as endangered and state listed as threatened. San Joaquin kit fox prefers open habitats such as grasslands and open scrubland and is commonly associated with valley saltbush scrub and annual grasslands. It also inhabits grazed grasslands, petroleum fields, urban areas, and lands adjacent to tilled or fallow fields. In Bakersfield, a San Joaquin kit fox uses human-made structures such as culverts, pipes, and crawl spaces under portable buildings. It is also known to den in landscaped areas of parking lots or existing buildings and in residential, commercial, school, or recreational areas such as golf courses and parks. Despite its adaptation to urban conditions, its population concentrations are frequently found in remnant patches of open spaces, low-density industrial areas, and water catchment basins. The Bakersfield area is known to support a substantial population of San Joaquin kit fox. The Caltrans and City of Bakersfield Implementation Plan was used as the baseline for the assessment of the biological study area.

Surveys in 2008 located one San Joaquin kit fox carcass, eight potential San Joaquin kit fox dens, two active dens, one active natal den system, and five locations with San Joaquin kit fox sign within the biological study area. In 2009, there was an incidental observation of one additional potential den located in the drainage west of Miramonte Drive.

Suitable San Joaquin kit fox habitat within the biological study area consists of valley saltbush scrub, agricultural, nonnative grassland, and ruderal habitat. Results of the 2008 surveys and analysis of existing San Joaquin kit fox information suggest that the San Joaquin kit fox is prevalent in nonnative grasslands, valley saltbush scrub, and ruderal areas surrounding State Route 178, as well as the abandoned baseball diamond, Rio Bravo Golf and Country Club, and the residential community along this alignment. San Joaquin kit fox locations found on the roads bisecting State Route 178 indicate that the San Joaquin kit fox may be using these linear features for travel and, potentially, existing culverts under State Route 178 to access open space north and south of the highway.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to threatened and endangered species since none would be affected.

Build Alternative

Blunt-Nosed Leopard Lizard

The Build Alternative would directly affect 45.07 acres of nonnative grassland and 0.36 acre of valley saltbush scrub. The loss of suitable habitat would be considered a direct affect on blunt-nosed leopard lizard by potentially impeding movement of the species, if present, and reducing the abundance of potential prey such as grasshoppers, crickets, and moths.

If blunt-nosed leopard lizard is present, construction-related direct impacts (work to infrastructure, laydown, and equipment staging areas) and indirect impacts (noise and vibration) on blunt-nosed leopard lizard habitat could occur where the construction footprint overlaps or is adjacent to suitable habitat.

Construction activities could result in direct mortality of blunt-nosed leopard lizard, if present, during construction activities. Since this species frequently uses burrows of small mammals, it may be incidentally buried during earthmoving work. Potential direct adverse impacts include being crushed by vehicles, entrapment in trenches or pits, and incidental

burial. The blunt-nosed leopard lizard is a fully-protected state endangered species. As such, the California Department of Fish and Game cannot authorize any take of this species.

San Joaquin Kit Fox

The Build Alternative would directly affect a total of 126.88 acres in the biological study area. Of this total, about 79.58 acres (34.15 acres of ruderal habitat, 45.07 acres of nonnative grassland, and 0.36 acre of valley saltbush scrub) were determined to be communities potentially used by San Joaquin kit fox. The State Route 178 widening is considered to have a high potential to affect the species since the alignment includes moderate to extensive loss of acreage in habitat composed primarily of nonnative grassland and ruderal portions of developed areas with maximum existing opportunities for San Joaquin kit fox denning and foraging.

The loss of habitat resulting from implementation of the Build Alternative would reduce connectivity of kit fox habitat and increase habitat fragmentation. Roadway expansion could bisect safe movement corridors and thus reduce the probability that kit foxes could safely leave one suitable habitat to search for new denning and foraging areas. Areas that currently serve as kit fox habitat could be degraded by the expanded roadway and associated infrastructure to the extent that they no longer function as suitable habitat. Reduced connectivity associated with the buildout of this alignment could force kit fox to move through areas that present greater risk such as increased potential for predation and vehicle strikes.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures are required for the Build Alternative:

Blunt-Nosed Leopard Lizard

Implementation of compensatory mitigation associated with the Metropolitan Bakersfield Habitat Conservation Plan (acquisition of habitat of similar or greater value at a 3 to 1 ratio or habitat of higher value at a 1 to 1 ratio) would mitigate the loss of habitat.

To ensure absence of blunt-nosed leopard lizard within the project impact area, focused preconstruction surveys would be conducted to identify the species presence and/or important habitat features. Protocol surveys would be completed the season prior to the onset of ground disturbance and would include daytime line transect surveys consistent with California Department of Fish and Game 2004 protocol guidelines. Surveys would include areas of surface disturbance, appropriate buffers, access routes, and cross-country travel routes. Surveys would be designed to identify habitat features suitable to the leopard lizard. If individuals or features are found during these surveys, additional appropriate avoidance measures would be taken. Based on preconstruction survey results, Caltrans would

implement the following measures to minimize potential impacts to the blunt-nosed leopard lizard (depending on the recommendations of the U.S. Department of Fish and Wildlife Service and the California Department of Fish and Game):

- **ES-1**—Preconstruction surveys would be conducted within the biological study area within 30 days prior to construction. If blunt-nosed leopard lizard is observed within the biological study area, U.S. Fish and Wildlife Service and California Department of Fish and Game would be contacted to discuss ways to proceed with the project and avoid take to the maximum extent practical.
- **ES-2**—A Worker Environmental Awareness Program for construction personnel would be required before construction begins. The program would provide workers with information on their responsibilities with regard to blunt-nosed leopard lizard: locations of environmentally sensitive areas, exclusion zones, timing constraints, and communication with biological monitors.
- **ES-3**—If during preconstruction surveys blunt-nosed leopard lizards are found to be in the project impact area, exclusionary fencing would be installed and maintained throughout construction.
- **ES-4**—Burrows that may be used by blunt-nosed leopard lizards would be avoided to the greatest extent practicable.
- **ES-5**—Initial surface disturbing actions that occur during the active blunt-nosed leopard lizard season would be monitored by a qualified biologist. Surface disturbing actions in potentially suitable habitat would be scheduled during the active season (about April 15 to October 15) when air temperatures are between 77° Fahrenheit and 95° Fahrenheit to maximize the lizard's ability to escape from slow-moving equipment and minimize the risk of accidental entombment in burrows.
- **ES-6**—An approved biologist would monitor initial surface disturbing activities within suitable blunt-nosed leopard lizard habitat.
- **ES-7**—To prevent inadvertent entrapment of blunt-nosed leopard lizards during construction, any trenches that are open during the active season would be surveyed in the morning and late afternoon hours to remove any blunt-nosed leopard lizards that fall into the trenches.

San Joaquin Kit Fox

Avoidance and minimization measures for the San Joaquin kit fox have been developed in consultation with the U.S. Fish and Wildlife Service and the California Department of Fish and Game. The following measures were identified for the State Route 178 widening:

- **ES-8**—Construction activities will adhere to the standard construction and operational requirements as described in the U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to and During Ground Disturbance (U.S. Fish and Wildlife Service 2011).
- **ES-9**—Approximately 60 days before road construction, a U.S. Fish and Wildlife Service- and California Department of Fish and Game-approved biologist will conduct a survey for San Joaquin kit fox dens within 200 feet of the construction footprint and utility relocations. A letter report and map of known and potential San Joaquin kit fox dens will be submitted to U.S. Fish and Wildlife Service and California Department of Fish and Game.
- **ES-10**—Pre-activity clearance surveys for San Joaquin kit fox will be repeated approximately two weeks before construction or after any delays in construction of over two weeks. Any new San Joaquin kit fox dens identified since completing the 60-day survey will be reported to U.S. Fish and Wildlife Service and California Department of Fish and Game in a letter report and map. If no new San Joaquin kit fox dens are identified, an internal record will be maintained that includes the survey date, designated biologist conducting the survey, and general survey findings. The records can be submitted to U.S. Fish and Wildlife Service and California Department of Fish and Game upon request.
- **ES-11**—Disturbance to all San Joaquin kit fox dens will be avoided to the maximum extent possible. If dens or potential dens are detected within the project footprint during 60-day and/or two-week pre-activity clearance surveys, agency permission will be requested to monitor and excavate dens that would be affected by the project. Active dens will not be excavated during the natal season (about January 1–June 14). The agency-approved biologist will monitor potential dens for three consecutive nights and submit monitoring results in a letter report to U.S. Fish and Wildlife Service and California Department of Fish and Game. The biologist will also oversee the excavation of abandoned dens following approval by U.S. Fish and Wildlife Service and Department of Fish and Game.
- **ES-12**—Dens found within 200 feet of project construction not be affected by construction activities will be monitored and buffered by an exclusion zone as measured outwards from the den entrance or cluster of entrances; potential or atypical dens will be flagged by a 50-foot radius buffer, and known dens will be flagged by a 100-foot buffer. If natal/pupping dens are discovered within the action area or within 200 feet of the action area, the U.S. Fish and Wildlife Service will be notified immediately. The

biologist will submit results of den excavation and exclusion in a letter report to U.S. Fish and Wildlife Service and California Department of Fish and Game.

- **ES-13**—The agency-approved biologist will conduct a Worker Environmental Awareness Program for all construction crews before ground-disturbing activities. The training is to inform construction crews of permit terms and conditions, plus the potential for San Joaquin kit fox to be affected by construction activities. The training will be repeated to all new crew members and annually to all crew members working in San Joaquin kit fox habitat. Following the training, crew members will sign a sheet stating that they attended the training and understand the protection measures and construction restrictions. Training materials and records of attendees will be submitted to U.S. Fish and Wildlife Service and California Department of Fish and Game.
- **ES-14**—The agency-approved biologist will monitor road construction activities once daily. The biologist will verify that construction complies with the measures laid out in the biological opinion, as well as construction and operation requirements described in U.S. Fish and Wildlife Service Standardized Recommendations for the Protection of the San Joaquin Kit Fox Prior to Ground Disturbance (U.S. Fish and Wildlife Service 2011).
- **ES-15**—The biologist will maintain a log of daily monitoring notes that can be summarized and transmitted to U.S. Fish and Wildlife Service and California Department of Fish and Game at their request.
- **ES-16**—Permeable fencing will be installed along the proposed State Route 178 right-of-way in all locations where new fencing is required. One or a combination of the following three design options may be adopted to provide San Joaquin kit fox with movement opportunities: elevating the bottom of the fence 5 inches above ground to allow unobstructed movement by San Joaquin kit fox under the fence; installing ground-level 8 x 8-inch-wide gaps no more than 100 feet apart for the length of the fence to allow San Joaquin kit fox movement at regular intervals along the right-of-way; and installing fencing with a minimum mesh size of 3½ x 7 inches (preferably 5 x 12 inches) that would allow unlimited movement by San Joaquin kit fox through the fence. Permeable fence design, when implemented in conjunction with all project design modifications, is expected to reduce the potential to disrupt north-south San Joaquin kit fox movement in the project area.
- **ES-17**—The project proposes to retain existing culverts to the extent feasible; however, if modification (including extension) and/or replacement of the culverts are required to accommodate the proposed widening of the roadway, then the culverts should be designed in such a way as to increase the openness index to provide movement

opportunities for the San Joaquin kit fox. Grating will be installed at the entrance to each culvert that is expected to serve as a crossing structure. Hinged iron grates within 6- x 6-inch grating are recommended, but the grating should be small enough to exclude San Joaquin kit fox predators.

- **ES-18**—A U.S. Fish and Wildlife Service- and California Department of Fish and Game -approved biologist will inspect culverts included in the project design modifications in the biological study area once annually during April and May for three years following construction to verify that access is not impeded by debris.
- **ES-19**—The permanent loss of San Joaquin kit fox habitat includes 45.07 acres of non-native grassland, 0.36 acre of valley saltbush scrub and up to 34.15 acres of ruderal habitat that will be mitigated by participating in the Metropolitan Bakersfield Habitat Conservation Plan fee payment program. Fees will be paid at a ratio of 3 to 1 for a total of up to 238.74 acres of mitigation. Prior to construction, the limits of impacts would be verified and mapped by habitat type within those limits. The map would be submitted for approval from the U.S. Fish and Wildlife Service before submittal to the City of Bakersfield Planning Department for fee payment (see Table 2-26).

Table 2-26 Compensatory Mitigation Ratios for Loss of Habitat

Affected Habitat Type	Proposed Compensatory Mitigation Ratios for Permanent Impacts	Permanent Impacts (acreage)	Mitigate with MBHCP[1] (acreage)
Nonnative Grassland	Acquisition of habitat of similar or greater value at 3:1 ratio	45.07	135.21
Valley Saltbush Scrub	Acquisition of habitat of similar or greater value at 3:1 ratio	0.36	1.08
Ruderal Habitat	Acquisition of habitat at 3:1 ratio	34.15	102.45
Total Acreage to Mitigate with the Metropolitan Bakersfield Habitat Conservation Plan		79.58	238.74

[1]All impacts within the project area are considered permanent. No temporary impacts have been defined.
MBHCP=Metropolitan Bakersfield Habitat Conservation Plan

2.3.6 Invasive Species

Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 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 guidance issued August 10, 1999 directs the

use of the state's invasive species list currently maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Protection Act analysis for a proposed project.

Affected Environment

The Natural Environment Study prepared for the proposed project in September 2011 addressed invasive species. The 2009 focused plant surveys conducted for the Natural Environment Study identified 20 invasive plant species as occurring within the project area and 100-foot buffer: yellow star-thistle, blessed milk thistle, black mustard, radish, London rocket , berry saltbush, prickly Russian-thistle, red-stemmed filaree, white horehound, edible fig, tree tobacco, small-flowered tamarisk, Mexican fan palm, wild oat, ripgut brome, soft chess, foxtail chess, Mediterranean barley, Italian ryegrass, and rat-tailed fescue. These species are classified as exotic pest plants by the California Invasive Plant Council (2006) and thus are known to invade natural open space areas and degrade native ecosystems.

Environmental Consequences

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to invasive species.

Build Alternative

It is expected the Build Alternative would have direct impacts on the entire biological survey area that includes 265.85 acres of habitat and developed areas. A total of 177.6 acres of habitat will be removed and 88.25 acres of developed area. Portions of the biological survey area may remain undeveloped and serve as a shoulder and/or maintenance buffer for the highway. Post-construction bare ground can serve as a breeding ground for invasive plant species. Based upon the analysis above, the Build Alternative could result in adverse impacts associated with invasive species.

Construction Impacts

During construction activities, construction vehicles may transport invasive plant species from past work sites to the study area or between work areas within the study area. The potential for adverse effects to natural open spaces from the introduction of invasive species is a possibility and potential adverse impacts could be severe.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measures are required for the Build Alternative.

In compliance with the Executive Order 13112 on Invasive Species and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project would not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions would be taken if invasive species were found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies.

Project construction is expected to disturb the ground and remove both nonnative and native vegetation. To minimize the spread of invasive plants and/or seeds during construction, the following measures would be used:

- **IS-1**—Construction equipment will be cleaned of mud or other debris that may contain invasive plants and/or seeds and inspected to reduce the potential of spreading noxious weeds to the project site and before leaving the site during the course of construction.
- **IS-2**—Trucks carrying vegetation will be covered and vegetation materials removed from the site will be disposed of in accordance with applicable laws and regulations.
- **IS-3**—During post-construction, any disturbed areas remaining as bare ground will be hydroseeded with a U.S. Fish and Wildlife Service- and California Department of Fish and Game-approved seed mix.
- **IS-4**—Reclamation of disturbed areas will be done as soon as possible following construction.
- **IS-5**—Fertilizer will not be applied to reclaimed areas with known weed infestations; nutrients can enhance the growth of weeds.
- **IS-6**—Straw bales used for sediment barriers or mulch will be certified weed-free.
- **IS-7**—Post-construction monitoring and treatment of weed infestation within the biological study area will be implemented as needed.

2.4 Cumulative Impacts

Regulatory Setting

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 time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through the displacement and fragmentation of habitats and populations; alteration of hydrology; contamination; erosion; sedimentation; disruptions of migration corridors; changes in water quality; and introduction or promotion of predators. Land use activities can also contribute to the potential community impacts identified for the project: changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The California Environmental Quality Act definition of cumulative impacts is found in Section 15355 of the CEQA Guidelines. The National Environmental Policy Act definition of cumulative impacts is be found in 40 CFR, Section 1508.7 of the Council on Environmental Quality Regulations.

Affected Environment

No-Build Alternative

Under the No-Build Alternative the current configuration of State Route 178 would be maintained and no widening would occur. It would remain a two- and four-lane highway within the project limits. As such, the No-Build Alternative would not result in adverse impacts related to cumulative impacts since no changes would result.

Build Alternative

The cumulative analysis focuses on the resources that the proposed project may affect. If the State Route 178 widening project does not result in impacts to a resource, it does not have a cumulative impact. The following resources are identified for cumulative analysis: visual/aesthetics, cultural resources, paleontology, biological environment, and noise. The cumulative study area for each of these resources is defined below. The affected environment for each of these resources was discussed in their respective portions of Chapter 2.

- **Visual/Aesthetics**—The resource study area for possible cumulative impacts to visual resources would be based on the views of the proposed project area.
- **Cultural Resources**—The resource study area for possible cumulative impacts to cultural resources would be based on the archaeological or historic architectural resources contained within the Metropolitan Bakersfield General Plan Northeast Planning Area and composed of the planned and approved projects listed in Table 2-1.

- **Paleontology**—The Resource Study Area for possible cumulative impacts to paleontological resources would be based on the archaeological or historic architectural resources contained within the Metropolitan Bakersfield General Plan's Northeast Planning Area and comprising the planned and approved projects contained in Table 2-1.
- **Biological Environment**—The Metropolitan Bakersfield Habitat Conservation Plan was developed to address cumulative impacts to the biological environment that would occur with development in the area. Therefore, the cumulative impact study area would be the Metropolitan Bakersfield Habitat Conservation Plan planning area.
- **Noise**—The resource study area for possible cumulative impacts associated with noise would be based on the archaeological or historic architectural resources contained within the Metropolitan Bakersfield General Plan Northeast Planning Area and would be composed of the planned and approved projects listed in Table 2-1.

This analysis considers known projects identified for the northeast Bakersfield area shown on Figure 2-2 and described in Table 2-1. In addition, long-term growth projections for the northeast Bakersfield area developed by the Kern Council of Governments are also considered since the growth projections represent approved future development scenarios considered both growth and transportation improvements for the project design year (2035).

Environmental Consequences

Visual/Aesthetics

The Metropolitan Bakersfield General Plan Update (2002) identifies northeast Bakersfield as an area that could experience rapid urbanization by 2035. Rural undeveloped parcels with scattered residential subdivisions currently comprises the area. Viewer groups include local residents and motorist traveling along State Route 178. Most views within the area are of the Sierra Nevada Mountains to the east and undeveloped lands. These views are generally expansive and uninterrupted. Planned and approved projects within the study area would dramatically alter the existing visual landscape of this area and reduce viewshed quality.

The Metropolitan Bakersfield General Plan Update Environmental Impact Report (2002) indicates that intensification of land uses in certain areas, especially the northeast, could potentially alter landforms, scenic vantage points, and the overall character, thus, potentially affecting scenic resources. However, many of the outstanding resources such as the major ridgelines and scenic recreational areas are set aside for preservation or open space and, therefore, would not be adversely affected by future growth. Moreover, some existing scenic vantage points are not in areas designated for open space or preservation land uses, but rather for residential land uses.

In addition, the analysis determined that all new county-wide development projects would undergo environmental and design review on a site-specific, project-by-project basis to ensure visual compatibility and enhancement of the surrounding environment. Further, with the implementation of General Plan Update goals and policies, the visual environment and character of metropolitan Bakersfield would obtain the high level of quality desired by the city and county. With project-specific environmental and design review by the city and county, the environmental impact report determined that cumulative aesthetic impacts would be considered less than significant. The determinations contained in the environmental impact report remain valid for this environmental assessment/initial study. Therefore, the proposed project would not have adverse cumulative environmental consequences.

Cultural Resources and Paleontological Resources

The northeast Bakersfield rural area is mostly isolated urban development composed of residential subdivisions. The current inventory of archaeological, paleontological, and historic architectural resources is therefore limited. Moreover, as urbanization continues to occur in this area, potential for discovery of cultural and paleontological resources may increase. The 2002 Metropolitan Bakersfield General Plan Update Environmental Impact Report indicates that projected growth in Bakersfield and Kern County would expand the urban area, potentially resulting in the degradation or loss of historic, archaeological, and paleontological resources. The actual impact from this expansion depends on whether the proposed development occurs in areas of high, moderate or low archaeological sensitivities.

Thus, potential impacts would be site-specific and an evaluation would need to be conducted on a project-by-project basis. Each incremental development would be required to comply with all applicable state and federal regulations concerning preservation, salvage, or handling of cultural resources. Anticipated cumulative development would result in a less than significant impact to cultural resources. The determinations contained in the environmental impact report remain valid for this environmental assessment/initial study. Therefore, the proposed project would not result in adverse cumulative environmental consequences.

Noise

Noise levels within the northeast Bakersfield area are determined by existing land uses. Large portions of the area are rural with few land uses that generate noise. In general, State Route 178 and the intermittent residential subdivisions and public facilities adjacent to it constitute the principal sources of noise. The Metropolitan Bakersfield General Plan indicates this area is anticipated to rapidly urbanize by 2035. As such, corresponding noise levels would increase as existing land uses are converted from vacant to residential, commercial, and light industrial uses. Increased roadway noise would also be expected.

The analysis contained in the 2002 Metropolitan Bakersfield General Plan Update Environmental Impact Report determined that despite implementation of general plan goals and policies, significant and unavoidable noise impacts are expected to occur with buildout of the northeast area. However, it should be noted that the City of Bakersfield employs design guidelines and zoning requirements to ensure that land uses are compatible and do not include uses or conditions that result in noise levels in excess of those permitted in its municipal code. These requirements also include the construction of sound walls and other acoustic treatments to reduce noise to levels acceptable under applicable ordinances. As such, approved and planned projects within northeast Bakersfield would be required to comply with the city noise requirements Based on the analysis above, therefore, the proposed project would not result in adverse cumulative environmental consequences.

Threatened and Endangered Species

Due to the migratory nature of the San Joaquin kit fox, the study area for threatened and endangered species is the city of Bakersfield and the immediate vicinity of the project.

Nine in-fill development projects are proposed in the vicinity of the proposed highway project. Due to the small scale and nature of these projects, they are not expected to incrementally increase habitat fragmentation and species death. The Build Alternative—in combination with these residential and commerical development projects in northeast Bakersfield and the Thomas Roads Improvement Program projects—would lead to habitat loss, increased habitat fragmentation, and increased risk of death caused by vehicle strikes.

The Thomas Roads Improvement Program expects that improvements to infrastructure would result in conversion of potential San Joaquin kit fox habitat to roadway structures. This would cause habitat loss and habitat fragmentation that can lead to loss of connectivity between potential denning and foraging areas. Reduced habitat connectivity associated with the buildout of the Thomas Roads Improvement Program roadways and infrastructure could force San Joaquin kit foxes to use different areas for movement that could result in greater exposure to potential predators. Specifically, areas that potentially serve as suitable habitat would be degraded by the new and expanded roadways and associated infrastructure to the extent that they would no longer function as suitable habitat. Conversion of suitable habitat to developed/human-made habitat would further expose San Joaquin kit foxes to predators and contaminants.

The Thomas Roads Improvement Program projects would improve the overall roadway system in Bakersfield by increasing the width of the roads, traffic speeds, and the movement of vehicles in and out of the area. Consequently, the potential for San Joaquin kit fox injury or death due to vehicle strikes would be greater.

In addition, the Thomas Roads Improvement Program projects could result in incremental/increased exposure of San Joaquin kit foxes to human disturbance. Kit foxes in Bakersfield are well adapted to the urban development, but the increase in the width of the roads and construction of new roads would make it more difficult for them to pass safely from one area to another. The Thomas Roads Improvement Program projects would incorporate project design features and measures presented in the San Joaquin kit Fox Study (March 2010) to minimize impacts to the kit foxes and help their movement within the city.

Caltrans, in cooperation with the City of Bakersfield, U.S. Fish and Wildlife Service, and California Department of Fish and Game, is developing a San Joaquin Kit fox Effects Analysis Mitigation Strategy, which proposes various measures to mitigate for cumulative effects to Kit Fox. This stategy includes a Sump Habitat Program that intends to provide long-term habitat conservation for the urban San Joaquin kit fox population. Use of mitigation measures C-1 through C-12 would mitigate for the project's contribution to the potential cumulative impacts to the San Joaquin kit fox.

Avoidance, Minimization, and/or Mitigation Measures

The avoidance, minimization, and mitigation measures noted in Chapter 2 of this initial study/environmental assessment and the mitigation measures listed below would ensure that the project does not result in cumulative impacts to the San Joaquin kit fox.

C-1— The Sump Habitat Program, as outlined in the San Joaquin Kit Fox Effects Analysis Mitigation Strategy, and Implementation Plan will provide long-term habitat conservation for the urban San Joaquin kit fox population in the metropolitan Bakersfield area by focusing on sumps, or storm-water drainage basins, as known and functional habitat for the species. The city, in coordination with Caltrans, proposes to use the Sump Habitat Program to compensate for cumulative effects to the San Joaquin kit fox affected by this and five future Thomas Roads Improvement Program projects.

Conservation goals of this program include measures addressing the installation of artificial dens in selected sumps; enhancement of San Joaquin kit fox habitat by controlling vegetation in and around dens; increase San Joaquin kit fox accessibility to sumps through fence and gate openings with proposed dimensions of 6 x 6 inches to exclude predators like coyotes and medium- to large-sized dogs; and reduction in the potential for impacts to the San Joaquin kit fox associated with regular maintenance activities and predator access.

The City of Bakersfield, on August 10, 2010, provided a letter of commitment to the U.S. Fish and Wildlife Service fully supporting and providing assurance of the implementation and management of the Sump Habitat Program and its conservation efforts.

The following is the current conceptual framework for the Sump Habitat Program:

- C-2— Selection of sumps that maintain San Joaquin kit fox accessibility and/or habitat with high to medium conservation priority based on the relative potential for minimizing both project-level and program-level effects
- C-3— Installation and maintenance of San Joaquin kit fox enhancement features: fences/gate gaps, artificial dens, conservation zones, signs, and enhancement maintenance and repair
- C-4— Management of sump vegetation compatible with San Joaquin kit fox presence and/or use: performance of routine maintenance outside the San Joaquin kit fox natal season and the use of hand tools in conservation zones and new active dens
- C-5— Biological monitoring and reporting of results: pre-maintenance surveys, den monitoring and supervised den excavation, environmental awareness training, maintenance monitoring, annual enhancement inspection, annual San Joaquin kit fox sump use monitoring, and annual reporting
- C-6— Provisions for long-term conservation assurances such as individual conservation easements for each sump; a perpetual non-wasting endowment for management, maintenance, and monitoring costs associated with ongoing implementation; and an agency-approved long-term management plan. The proposed easement and endowment holders must be U.S. Fish and Wildlife-approved third-party organizations.

In addition, the following design modifications are proposed for TRIP projects to avoid and minimize impacts on kit fox:

- C-7— Design projects without fencing or use only kit fox permeable fencing where feasible. The following are three options to fencing modifications:
    1. Elevate the bottom of the fence 5 inches aboveground to allow unobstructed movement by kit foxes under the fence
    2. Install ground-level 8 x 8-inch wide gaps no more than 100 feet apart for the length of the fence
    3. Install fencing with a minimum mesh size of 3.5 x 7 inches, preferably 5 x 12 inches
- C-8— Where curbed medians are required on roadways, they are to be no greater than 6 inches high with landscape vegetation kept low
- C-9— When median barriers greater than 10 inches tall are required on roadways accessible to kit fox (at grade), the use of Caltrans Type 60/S median barrier, recently modified to allow passage by kit fox, are recommended for use (USFWS Biological Opinion 81420-2009-F-0752; 2009)

- C-10— Where feasible and appropriate, current drainage culverts and reinforced concrete boxes are to be retained and/or widened
- C-11— Where feasible, undercrossing structures shall include escape pipes made of 10-inch diameter corrugated metal pipe no less than 10 feet long with the ends of each pipe narrowing to 4 to 6-inches. A hinged, iron gate with 6 x 6 inch grating can be constructed over each entrance of the crossing structure. Entrances shall be at ground level.
- C-12— Where curbed median and roadside landscaping are proposed, the following landscaping alternatives should be used:
    1. Select plants that do not exceed 6 inches tall at maturity
    2. Maintain vegetation height so that it does not exceed 6 inches
    3. Create gaps no less than 4-feet wide every 12 feet in areas landscaped with trees and shrubs
- C-13— Minimize impacts on kit fox habitat consistent with design criteria and requirements for the facility. For example, minimize project footprint and, where feasible, limit staging and access areas that have low value as kit fox habitat.

2.5 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 gases, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the 1988 establishment of the Intergovernmental Panel on Climate Change by the United Nations and World Meteorological Organization has led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are mainly concerned with human activity emissions of greenhouse gases that include carbon dioxide, methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

Typically, two terms are used when discussing the impacts of climate change. "Greenhouse gas mitigation" is a term for reducing greenhouse gas emissions in order to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to planning for and adapting to

impacts from climate change, such as adjusting transportation design standards to withstand more intense storms and higher sea levels[1].

In California, passenger cars, light-duty trucks, other trucks, buses and motorcycles are second only to electricity generation as the source of greenhouse gases. The dominant greenhouse gas emitted is carbon dioxide (CO_2), mostly from fossil fuel combustion.

There are four main strategies for reducing greenhouse gas emissions from transportation sources: (1) improve system and operation efficiencies; (2) reduce growth of vehicle miles traveled; (3) transition to fuels with lower greenhouse gas emissions; and (4) improve vehicle technologies. To be most effective, all four should be pursued collectively. The following regulatory setting section outlines state and federal efforts to comprehensively reduce greenhouse gas emissions from transportation sources.

Regulatory Setting

State

With th e passage of several pieces of legislation including state senate and assembly bills and executive orders, California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change at the state level.

- *Assembly Bill 1493, Pavley. Vehicular Emissions: Greenhouse Gases* (Assembly Bill 1493), 2002—Requires the California Air Resources Board to develop and implement regulations to reduce automobile and light-truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. In June 2009, the U.S. Environmental Protection Agency Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own greenhouse gas emission standards for motor vehicles beginning with model year 2009. California agencies will be working with federal agencies to conduct joint rulemaking to reduce greenhouse gas emissions for passenger cars model years 2017-2025.
- *Executive Order S-3-05* (signed on June 1, 2005, by then-Governor Arnold Schwarzenegger)—The goal of this executive order is to reduce California's greenhouse gas emissions to the following levels: 1) 2000 levels by 2010, 2) 1990 levels by the 2020, and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.
- *Assembly Bill 32, the Global Warming Solutions Act of 2006*—Assembly Bill 32 sets the same overall greenhouse gas emissions reduction goals as outlined in Executive Order S-

[1] http://climatechange.transportation.org/ghg_mitigation/

3-05, while further mandating that the California Air Resources Board create a plan that includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing Assembly Bill 32, including the recommendations made by the State's Climate Action Team.

- *Executive Order S-01-07*—Then-Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.
- *Senate Bill 97* (Chapter 185, 2007)—Required the Governor's Office of Planning and Research to develop recommended amendments to the State California Environmental Quality Act Guidelines for addressing greenhouse gas emissions. The amendments became effective on March 18, 2010.

Federal

Although climate change and greenhouse gas reduction are a concern at the federal level, currently no regulation or legislation has been enacted specifically addressing greenhouse gas emissions reductions and climate change at the project level. Neither the U.S. Environmental Protection Agency nor the Federal Highway Administration has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis.

As stated on the Federal Highway Administration's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process would help facilitate decision-making and improve efficiency at the program level, and would inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies set forth by the Federal Highway Administration to lessen climate change impacts do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency such as the "National Clean

Car Program" and Executive Order 13514- *Federal Leadership in Environmental, Energy and Economic Performance*.

Executive Order 13514 is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also directs federal agencies to participate in the interagency Climate Change Adaptation Task Force, which is engaged in developing a U.S. strategy for adaptation to climate change.

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the U.S. Environmental Protection Agency has the authority to regulate greenhouse gases. The court held that the U.S. Environmental Protection Agency Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the U.S. Environmental Protection Agency Administrator signed two distinct findings on greenhouse gases under Section 202(a) of the Clean Air Act:

- **Endangerment Finding**—The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding**—The Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution that threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. Environmental Protection Agency's *Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles*, which was published on September 15, 2009[2]. On May 7, 2010, the final *Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards* was published in the Federal Register.

The U.S. Environmental Protection Agency and the National Highway Traffic Safety Administration are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced greenhouse gas emissions and improved fuel efficiency from on-

[2] http://www.epa.gov/climatechange/endangerment.html

road vehicles and engines. These next steps include developing the first-ever greenhouse gas regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle greenhouse gas regulations. These steps were outlined by President Barack Obama in a memorandum on May 21, 2010.[3]

The final combined U.S. Environmental Protection Agency and National Highway Traffic Safety Administration standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut greenhouse gas emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016).

On January 24, 2011, the U.S. Environmental Protection Agency, U.S. Department of Transportation, and California announced a single timeframe for proposing fuel economy and greenhouse gas standards for cars and light-trucks (model years 2017–2025). Proposing the new standards in the same timeframe (September 1, 2011) signals continued collaboration that could lead to an extension of the current National Clean Car Program.

Project Analysis

An individual project does not generate enough greenhouse gas emissions to substantially influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of greenhouse gases.[4] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (see California Environmental Quality Act Guidelines Sections 15064[h][1] and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult if not impossible task.

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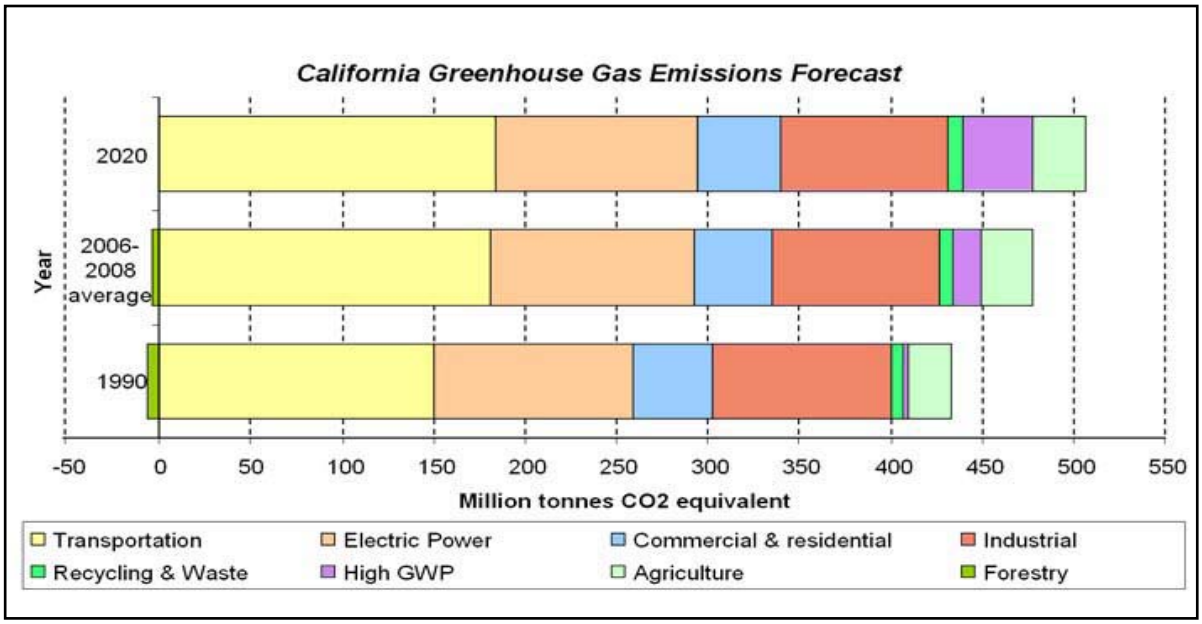
[3] http://epa.gov/otaq/climate/regulations.htm

[4] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The California Environmental Quality Act Guide, April 2011) and the U.S. Forest Service (Climate Change Considerations in Project Level National Environmental Policy Act Analysis, July 13, 2009).

The Assembly Bill 32 Scoping Plan contains the main strategies California would use to reduce greenhouse gases. As part of its supporting documentation for the Draft Scoping Plan, the California Air Resources Board released the greenhouse gas inventory for California (forecast last updated: 28 October 2010). The forecast is an estimate of the emissions expected to occur in the 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the greenhouse gas inventory for 2006, 2007, and 2008 (see Figure 2-16).



Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm

Figure 2-16 California Greenhouse Gas Forecast

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing greenhouse gas emission reduction and climate change. Recognizing that 98 percent of California's greenhouse gas emissions are from the burning of fossil fuels and 40 percent of all human made greenhouse gas emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans (see Climate Action Program at Caltrans, December 2006).[5]

Project- and regional-specific information presented in this section is based on the *Air Quality Study Report* (2011).

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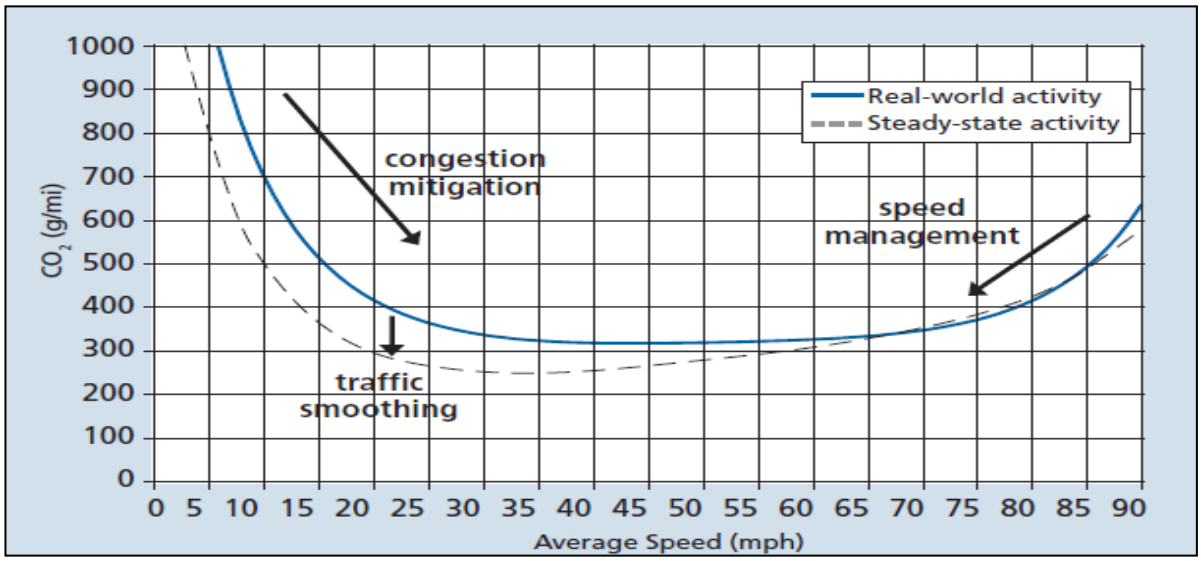
[5] Caltrans Climate Action Program is located at the following web address: http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

One of the main strategies in the Caltrans Climate Action Program to reduce greenhouse gas emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources such as automobiles, occur at stop-and-go speeds (0 to 25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0 to 25 miles per hour (see Figure 2-17). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors, greenhouse emissions, particularly carbon dioxide, may be reduced.



Source: Traffic Congestion and Greenhouse Gases: Matthew Barth and Kanok Boriboonsoms (TR News 268 May-June 2010) <http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf

Figure 2-17 Possible Effect of Traffic Operation Strategies in Reducing On-Road Carbon Dioxide Emission

Many studies show that an increase in traffic volume is related to higher overall carbon dioxide emissions. Traffic volumes are expected to increase under future conditions; however, operation of the project would increase traffic speed and flow, decrease congestion, and improve level of service along the project alignment. Widening the highway would increase traffic capacity, which tends to reduce congestion. Restoration of a free-flowing traffic pattern would reduce the amount of carbon dioxide emissions.

According to the 2011 Final Regional Transportation Plan, the Kern Council of Governments has invested significant resources adding signals in place of four-way stops, synchronizing signals, monitoring traffic, and providing a metropolitan traffic operations center. Significant reductions in vehicle emissions resulting from unnecessary idling and acceleration have been realized. According to state and federal Clean Air Acts, the worst non-attainment areas must ensure that "all feasible measures" be implemented to reduce harmful air emissions. A goal

of the 2011 Final Regional Transportation Plan focuses on carrying out these requirements to achieve required standards for healthy air.

The Kern Council of Governments existing transportation control measures focused on traffic flow improvements to attain its goals. Since 1990, the region's congestion, measured by vehicle miles traveled, increased 25 percent faster than the population. However, in the 1990s, average annual growth in vehicle miles traveled slowed from the 1980s, decreasing from 750,000 vehicle miles traveled per year to 500,000 vehicle miles traveled per year.

In its 2007 Ozone Plan, the San Joaquin Valley Air Pollution Control District proposed the adopting the following Employer-Based Trip Reduction rules to further decrease vehicle miles traveled within the basin:

- Require businesses with at least 100 employees to establish rideshare programs
- Schedule rule development and implementation as follows: adoption by the fourth quarter 2009, and compliance/reductions to begin by 2010
- Implement trip reduction programs following the U.S. Environmental Protection Agency guidelines for improving air quality (also known as the State Implementation Plan)
- Exploring the applicability of state laws governing parking payout programs and strengthening enforcement of those laws within the valley

The San Joaquin Valley Air Pollution Control District adopted Rule 9410, Employer-Based Trip Reduction, on December 17, 2009.

Implementation of the plans and programs stated above are designed to decrease vehicle miles traveled, reduce congestion at intersections, and improve traffic flow throughout the region. With these improvements, carbon dioxide emissions are expected to decrease from the vehicles using the roadway.

As discussed in section 1.2.6, Alternatives Considered but Eliminated from Further Discussion, several alternatives were considered but not carried forward because they did not meet the project objectives or were not possible because they would cost more than available funding. The eliminated alternatives included a build alternative and a transportation system management alternative. Though the transportation system management alternative was not carried forward as a separate alternative, components of the alternative such as signal optimization have been incorporated into the Build Alternative.

Quantitative Analysis

A quantitative analysis estimating carbon dioxide emissions for existing no-build and build conditions was performed using the California Air Resources Board EMFAC 2007 program.

Inputs used to estimate carbon dioxide emissions were based on annual vehicle miles traveled, vehicle mix, and vehicle miles traveled distribution by speed for the Kern County region. The results are shown in Table 2-27.

Table 2-27 Carbon Dioxide Emission Burden (tons per day)

Pollutant	Existing	No-Build 2035	Build 2035
Carbon Dioxide Emissions	18,810	32,860	32,867

Due to increases in total vehicle miles traveled, carbon dioxide emissions are expected to increase from existing conditions to 2035 conditions. With 2035 conditions, the total vehicle miles traveled is expected to increase from no-build to build conditions; therefore, there is a slight increase of carbon dioxide emissions. In both cases, the differences shown are well within the assumptions and accuracy of the traffic and emissions models. The conclusion is that implementation of the project would result in slightly higher, though no measurable increase in 2035 carbon dioxide emissions when compared to the future no-build conditions.

The estimated emissions shown in Table 2.23 are calculated for only a comparison between alternatives. The numbers are not necessarily an accurate reflection of what the true carbon dioxide emissions would be because carbon dioxide emissions are dependent on other factors that are not part of the model such as the fuel mix, rate of acceleration, and the aerodynamics and efficiency of the vehicles. EMFAC model emission rates are only for direct engine-out carbon dioxide 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.

Limitations and Uncertainties with Modeling

EMFAC

Although the Emission Factor Model can calculate carbon dioxide emissions from mobile sources, the model does have limitations when it comes to accurately reflecting carbon dioxide emissions. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008), studies have revealed that brief but rapid accelerations can contribute significantly to a vehicle's carbon monoxide and hydrocarbon emissions during a typical urban trip.

Current emission-factor models are insensitive to the distribution of such modal events such as cruise, acceleration, deceleration, and idle in the operation of a vehicle; instead the models estimate emissions by average trip speed. This limitation creates an uncertainty in the model’s results when compared to the estimated emissions of the various alternatives with the baseline in an attempt to determine impacts. Although work by the U.S. Environmental Protection Agency and the California Air Resources Board is underway on modal-emission

models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling.

In addition, the emission factor model does not include speed corrections for carbon dioxide in most vehicle classes—for most vehicle classes emission factors are held constant which means that the emission factor model is not sensitive to the decreased emissions associated with improved traffic flows for most vehicle classes. Therefore, unless a project involves a large number of heavy-duty vehicles, the difference in modeled carbon dioxide emissions due to speed change wouldebe slight.

The California Air Resources Board is currently not using the emission factor model to create its inventory of greenhouse gas emissions. It is unclear why the California Air Resources Board has made this decision. Their website only states the following:

> REVISION: Both the Emission Factor and OFFROAD Models develop carbon dioxide (CO2) and methane (CH4) emission estimates; however, they are not currently used as the basis for the California Air Resources Board's official greenhouse gas inventory which is based on fuel usage information. (http://www.arb.ca.gov/cc/inventory/inventory.htm). However, the California Air Resources Board is working towards reconciling the emission estimates from the fuel usage approach and the models.

Other Variables

With the current science, project-level analysis of greenhouse gas emissions is limited. Although a greenhouse gas analysis is included for this project, there are numerous key greenhouse gas variables that are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected carbon dioxide emissions.

First, vehicle fuel economy is increasing. The U.S. Environmental Protection Agency's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2008" (http://www.epa.gov/oms/fetrends.htm), 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 has improved each year beginning in 2005 and is now the highest since 1993.

Most of the increase since 2004 is due to higher fuel economy for light trucks, following a long-term trend of slightly declining overall fuel economy that peaked in 1987. These vehicles also have a slightly lower market share, peaking at 52 percent in 2004 with projections at 48 percent in 2008. Table 2-28 shows the alternatives for vehicle fuel economy increases studied by the National Highway Traffic Safety Administration in its Final

Environmental Impact Study for New Corporate Average Fuel Economy (CAFE) Standards (October 2008).

Table 2-28 Model Year 2015 Required Miles Per Gallon by Alternative

No Action		25% Below Optimized	Optimized (Preferred)	25% Above Optimized	50% Above Optimized	Total Costs Equal Total Benefits	Technology Exhaustion
Cars	27.5	33.9	35.7	37.5	39.5	43.3	52.6
Trucks	23.5	27.5	28.6	29.8	30.9	33.1	34.7

Source: National Highway Traffic Safety Administration, 2008.

Second, near zero carbon vehicles will come into the market during the design life of this project. According to a March 2008 report released by University of California at Davis, Institute of Transportation Studies entitled "Why Hydrogen and Fuel Cells are Needed to Support California Climate Policy":

> Large advancements have occurred in fuel cell vehicle and hydrogen infrastructure technology over the past 15 years. Fuel cell technology has progressed substantially resulting in power density, efficiency, range, cost, and durability all improving each year. In another sign of progress, automotive developers are now demonstrating over 100 fuel cell vehicles (FCVs) in California—several in the hands of the general public—with configurations designed to be attractive to buyers. Cold-weather operation and vehicle range challenges are close to being solved, although vehicle cost and durability improvements are required before a commercial vehicle can be successful without incentives. The pace of development is on track to approach pre-commercialization within the next decade.
>
> A number of the U.S. Department of Energy 2010 milestones for fuel cell vehicles development and commercialization are expected to be met by 2010. Accounting for a five to six year production development cycle, the scenarios developed by the U.S. Department of Energy suggest that 10,000s of vehicles per year from 2015 to 2017 would be possible in a federal demonstration program, assuming large cost share grants by the government and industry are available to reduce the cost of production vehicles.

Third and as previously stated, California has recently adopted a low-carbon transportation fuel standard. The California Air Resources Board is scheduled to come out with draft regulations for low carbon fuels in late 2008 with implementation of the standard to begin in 2010.

Fourth, driver behavior has been changing as the U.S. economy and oil prices have changed. In its January 2008 report, "Effects of Gasoline Prices on Driving Behavior and Vehicle Market," (http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf) the Congressional Budget Office found the following results based on data collected from California: 1) freeway motorists have adjusted to higher gas prices by making fewer trips and driving more slowly; 2) the market share of sports utility vehicles is declining; and 3) the average price for larger, less-fuel-efficient models have declined over the past five years as the average price for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles.

Limitations and Uncertainties with Impact Assessment

Figure 2-18, taken from the National Highway Traffic Safety Administration Final EIS for New CAFE Standards (October 2008), illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis. The report states, "Cascade of uncertainties typical in impact assessments showing the 'uncertainty explosion' as these ranges are multiplied to encompass a comprehensive range of future consequences, including physical, economic, social, and political impacts and policy responses."

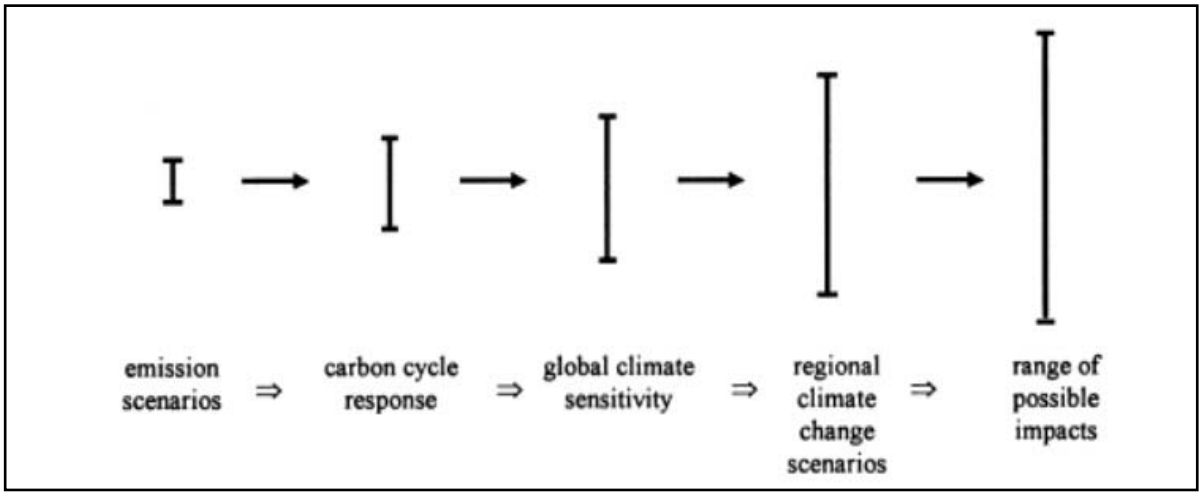


Figure 2-18 Cascades of Uncertainity

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 carbon dioxide emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of carbon dioxide equivalent. This uncertainty only increases when viewed globally. The Intergovernmental Panel on Climate

Change has created multiple scenarios in its document entitled "Climate Change 2007: The Physical Science Basis: Summary for Policy Makers" to project potential future global greenhouse gas emissions as well as 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 Intergovernmental Panel on Climate Change scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons of carbon dioxide from 2000 to 2030, an increase of between 25 and 90 percent.

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 carbon dioxide 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.

The complexities and uncertainties associated with project level impact analysis are further borne out in the Final Environmental Impact Statement completed by the National Highway Traffic Safety Administration addressing the Corporate Average Fuel Economy (CAFE) Standards (October 2008). As the text quoted below shows, even when dealing with greenhouse gas emission scenarios on a national scale for the entire passenger car and light truck fleet, the numerical differences among alternatives is very small and well within the error sensitivity of the model.

In analyzing across the CAFE 30 alternatives, the mean change in the global mean surface temperature, as a ratio of the increase in warming between the B1 (low) to A1B (medium) scenarios, ranges from 0.5 percent to 1.1 percent. The resulting change in sea level rise (compared to the No Action Alternative) ranges, across the alternatives, from 0.04 centimeter to 0.07 centimeter. In summary, the impacts of the model year 2011–2015 CAFE alternatives on global mean surface temperature, sea level rise, and precipitation are relatively small in the context of the expected changes associated with the emission trajectories. This is due primarily to the global and multi-sectoral nature of the climate problem. Emissions of CO_2, the primary gas driving the climate effects, from the United States automobile and light-truck fleet represented about 2.5 percent of total global emissions of all greenhouse gases in the year 2000 (EPA, 2008; CAIT, 2008). While a significant source, this is still a small percentage of global emissions, and the relative contribution of CO_2 emissions from the United States light-vehicle fleet is expected to decline in the future, due primarily to the rapid

growth of emissions from developing economies, which are, in part, a result of growth in global transportation-sector emissions.

Construction Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction greenhouse gas emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from 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 greenhouse gas emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

California Environmental Quality Act Conclusion

As discussed above, a future with the project and a future no-build condition show increases in carbon dioxide (CO_2) emissions over the existing levels; the future build carbon dioxide (CO_2) emissions are higher than the future no-build emissions. In addition, as discussed above, there are also limitations with the emission factor model and with assessing what a given carbon dioxide (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 greenhouse gas emissions and California Environmental Quality Act significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale 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.

Greenhouse Gas Reduction Strategies

Assembly Bill 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as the California Air Resources Board works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in Assembly Bill 32. Many of the strategies Caltrans is using to help meet the targets in Assembly Bill 32 come from the California Strategic Growth Plan, which is updated each year. Former-Governor Arnold Schwarzenegger's

Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade. The Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together are expected to reduce congestion. The Strategic Growth Plan relies on a complete systems approach to attain carbon dioxide reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 2-19.

Figure 2-19 Mobility Pyramid

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light- and heavy-duty trucks. Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team.

It is important to note, however, that control of the fuel economy standards is held by the U.S. Environmental Protection Agency and the California Air Resources Board. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California at Davis.

Table 2-29 summarizes the Caltrans and statewide efforts that Caltrans is implementing to reduce greenhouse gas emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

To the extent that it is applicable or feasible for the project and through coordination with the project development team, the following measures would also be included in the project to reduce the greenhouse gas emissions and potential climate change impacts from the project:

- **Use of Reclaimed Water**—Currently 30 percent of the electricity used in California is in the treatment and delivery of water. Use of reclaimed water helps conserve energy and reduces greenhouse gas emissions from electricity production.
- **Landscaping**—Landscaping reduces surface warming while photosynthesis decreases carbon dioxide.
- **Portland Cement**—Use of lighter colored surfaces such as Portland cement helps reduce the albedo effect (measure of how much light a surface reflects) and cools the surface; in addition, Caltrans has been a leader in the effort to add fly ash to Portland cement mixes. Adding fly ash reduces the greenhouse gas emissions associated with cement production— it also can make the pavement stronger.
- **Lighting**—Use of energy efficient lighting such as LED (light-emitting diode) traffic signals.
- **Idling Restrictions**—Idling restrictions for trucks and equipment at construction sites reduces fuel usage.

As described in section 1.2.3, the Build Alternative would reduce daily vehicle miles traveled and vehicle hours traveled. Implementation of this project would also substantially reduce congestion and idling along this portion of State Route 178, thereby reducing carbon dioxide emissions.

Table 2-29 Climate Change/Carbon Dioxide Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated Carbon Dioxide Savings (million miles traveled)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies and other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements and Intelligent Transportation System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.007	2.17
Mainstream Energy and Greenhouse Gases into Plans and Projects	Office of Policy Analysis and Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational and Information Program	Office of Policy Analysis and Research	Interdepartmental, California Environmental Protection Agency, California Air Resources Board, California Energy Commission		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening and Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 percent limestone cement mix 25 percent fly ash cement mix > 50 percent fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	California Environmental Protection Agency; California Air Resources Board; Business Transportation and Housing Agency; Metropolitan Planning Organizations		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					**2.66**	**18.67**

Source: Air Quality Study 2011

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. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by 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. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, then-Governor Schwarzenegger signed Executive Order S-13-08 that directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change.

The California Resources Agency (now the California Natural Resources Agency), through the interagency Climate Action Team, was directed to coordinate with local, regional, state, and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts, and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, the California Natural Resources Agency was directed to request the National Academy of Science to prepare a *Sea Level Rise Assessment Report* by December 2010 (now scheduled to be released in 2012) to advise how California should plan for future sea level rise. The report is to include the following:

- Relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates
- Range of uncertainty in selected sea level rise projections

- 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
- Discussion of future research needs regarding sea level rise for California

Furthermore, Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess the vulnerability of transportation systems to sea level rise and how sea level rise would affect safety, maintenance, and operational improvements of the system and the economy of the state. Caltrans continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Prior to the release of the final *Sea Level Rise Assessment Report*, all state agencies planning to build projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines.

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, storm surge and storm wave data. (Executive Order S-13-08 allows some exceptions to this planning requirement.) This project in Kern County is not one of the coastal counties mentioned in the final version of *The Impacts of Sea-Level Rise on the California Coast*.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being made as part of then-Governor Schwarzenegger's executive order on sea level rise and is mobilizing to respond to the National Academy of Science report on *Sea Level Rise Assessment* due for release by December 2010.

On August 3, 2009, the California Natural Resources Agency in cooperation and partnership with multiple state agencies released the 2009 California Climate Adaptation Strategy Discussion Draft that summarizes the best-known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats. The release of the draft document set in motion a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in

the creation of the discussion draft: Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture.

The discussion draft focuses on sectors that include public health; biodiversity and habitat; ocean and coastal resources; water management; agriculture; forestry; and transportation and energy infrastructure. The strategy is in direct response to then-Governor Schwarzenegger's November 2008 Executive Order S-13-08 that specifically asked the California Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the California Natural Resource Agency website on December 2, 2009 at: http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF.

Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans will be able review its current design standards to determine what changes, if any, may be warranted to protect the transportation system from sea level rise.

No Notice of Preparation was filed for the project. However, the project is programmed for construction funding between 2011 and 2015. Therefore, no further analysis of climate change adaptation is required.

Chapter 3 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, focused meetings, public notices, and letters. This chapter summarizes the results of Caltrans' efforts to identify, address, and resolve project-related issues.

3.1 Consultation Coordination

3.1.1 California Department of Fish and Game and U.S. Fish and Wildlife Service

Caltrans and the City of Bakersfield coordinated with the U. S. Fish and Wildlife Service and California Department of Fish and Game on the approach for San Joaquin kit fox field surveys, potential project-specific and program-level effects of the Thomas Roads Improvement Program projects, and mitigation options for project-specific impacts.

In 2007, the City of Bakersfield and Caltrans authorized AECOM to develop a conceptual strategy for San Joaquin kit fox to determine the potential effects the Thomas Roads Improvement Program Projects would have on San Joaquin kit fox and to evaluate mitigation options for such effects. The U.S. Fish and Wildlife Service and California Department of Fish and Game concurred that a conceptual strategy is needed. The U.S. Fish and Wildlife Service requested cumulative and project-specific analyses of potential effects on San Joaquin kit fox to comply with Section 7 consultation for each Thomas Roads Improvement Program Project that was evaluated.

In 2008, the U.S. Fish and Wildlife Service and California Department of Fish and Game concurred on methods to develop the San Joaquin kit fox conceptual strategy. The U.S. Fish and Wildlife Service, California Department of Fish and Game, Caltrans, AECOM, and the City of Bakersfield also agreed to meet throughout development of the conceptual strategy to ensure compliance with the Endangered Species Act and California Endangered Species Act.

In 2010, U.S. Fish and Wildlife Service and California Department of Fish and Game agreed that the letter from the Metropolitan Bakersfield Habitat Conservation Plan Trust Group to the City of Bakersfield (August 3, 2010), approving Thomas Roads Improvement Program

projects eligible to participate in the fee payment program, was valid for projects ready to build prior to expiration of the Metropolitan Bakersfield Habitat Conservation in 2014.

Formal project specific Section 7 Consultation for the San Joaquin kit fox would include U.S. Fish and Wildlife Service review of the Caltrans State Route 178 Widening Biological Assessment (July 2011). Upon completion of the consultation process, it is expected that the U.S. Fish and Wildlife Service will issue a Biological Opinion.

3.1.2 Native American Consultation

The Native American Heritage Commission was consulted as part of the analysis of cultural resources in the project area. Twenty-two Native American tribes or individuals were contacted for information and specific concerns regarding this project. According to the cultural resource technical reports completed for this project, only one Native American contact had any specific concerns regarding the project. The concern was related to work that would be done at the mouth of the canyon on State Route 178 and 5 miles from the canyon toward Bakersfield. One person did note that the general area was sensitive for Native American archaeological resources and noted that unanticipated discoveries have occurred on previous road improvement projects in the Bakersfield area.

On May 10, 2011, Mandy Marine, the Caltrans District 6 Native American Coordinator, sent nine letters to the various tribal groups in the immediate area of the proposed project. The letter provided information on the proposed changes to the project and directed the recipients to contact project cultural consultant Sherri Gust, Cogstone Resource Management, with any questions.

From May 24, 2011 to May 26, 2011, Cogstone Resource Management provided follow-up on the letters. No responses with additional concerns were received.

Chapter 4 List of Preparers

This document was prepared by the following Caltrans Central Region staff:

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This document was prepared by the following Thomas Roads Improvement Program staff:

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Jessica C. Wilkinson, AICP, Senior Planner, Parsons Brinckerhoff. Master of Urban and Regional Planning, California State Polytechnic University, Pomona; B.A., Political Science/Public Administration, California State Polytechnic University, Pomona; A.S, Architectural Technology, Mount San Antonio College, Walnut; 9 years of municipal and environmental planning. Contribution: Land Use, Growth, Traffic and Transportation/Pedestrian and Bicycle Facilities, coordinated environmental documentation.

Kevin Keller, Lead Environmental Planner, Parsons Brinckerhoff. B.A., Geography, Minor in History, California State University Fullerton; 22 years of environmental planning experience. Contribution: Oversight of Noise Study Report and Noise Abatement Decision Report and preparation and Noise and Vibration section.

Manny Saleminik, P.E. C60597, G.E. GE2645, Project Engineer, Parsons Brinckerhoff. M.S., Civil Engineering, San Jose State University; 16 years of geological experience in California. Contribution: Prepared Draft Geotechnical Design & Material Report.

Marisa Flores, Biologist, ICF International. B.S., Evolution and Ecology, University of California Davis; 7 years of biological consulting experience. Contribution: Prepared Biological Assessment.

Michael Lieu, Senior Planner, Parsons Brinckerhoff. B.S., Applied Ecology, University of California, Irvine; 9 years of environmental planning experience. Contribution: Prepared Noise Study Report, Noise Abatement Decision Report and Noise and Vibration section.

Mikael Romich, Senior Biologist, ICF International. B.S., Ecology, University of British Columbia; M.S., Environmental Science, Capilano University; 17 years of experience as a wildlife biologist. Contribution: Prepared Natural Environment Study.

Miriam (Wai Kwan) Leung, P.E. C73899, T.E. Tr2566, Parsons Brinckerhoff. B.E. Civil Engineering, University of Science and Technology, Hong Kong, M.S. Civil Enginering, University of California, Irvine; 6 years of experience in traffic engineering, operations and design. Contribution: Prepared Stage Construction Plan and Traffic Management Plan.

Mitchell L. Fong, P.E. C45690, G.E. GE2350, Geotechnical Engineer, Parsons Brinckerhoff. M.S. Civil Engineering, University of California, Berkley, B.S. Mineral Engineeing, University of California, Berkely; 22 years of geological experience in California. Contribution: Prepared Draft Geotechnical Design & Material Report.

Sherri Gust, Registered Professional Archaeologist, Cogstone Resource Management. M.S., Anatomy (Evolutionary Morphology) from the University of Southern California; B.S. in Anthropology from the University of California, Davis; over 25 years of experience in California. Contribution: Prepared Paleontological Identification and Evaluation Report and Preliminary Mitigation Plan; Historic Property Survey Report; and Archaeological Survey Report.

Theresa Dickerson, Lead Environmental Planner, Parsons Brinckerhoff. B.S., Landscape Architecture, California State Polytechnic University, Pomona; 24 years environmental planning experience. Contribution: Environmental Documentation Project Management, Visual/Aesthetics.

Uyenlan Vu, Environmental Planner II, Parsons Brinckerhoff. B.A., Environmental Analysis and Design, University of California at Irvine; B.A., Social Ecology, University of California at Irvine; 5 years of environmental planning experience. Contribution: Primary preparer Initial Site Assessment; Prepared Hazardous Waste/Materials, Air Quality, Traffic and Transportation, Climate Change, Hydrology and Floodplain, and Water Quality and Storm Water Runoff sections.

Chapter 5 Distribution List

The draft initial study/environmental assessment was distributed to the following agencies, elected officials, service providers, and utility companies. In addition, a Notice of Availability of the document has been sent to property owners within 500 feet of the project limits.

Federal Agencies

Ramon Aberasturi
U.S. Army Corps of Engineers
Regulatory Division
1325 J Street, Room 1480
Sacramento, CA 95814

Bill Pelle
U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

State Agencies

State Clearinghouse
Office of Planning and Research
1400 10th Street
Sacramento, CA 95814-5502

California Department of Fish and Game
Julie Means (Supervisor LSAA Section)
1130 East Shaw Ave., Suite 206
Fresno, CA 93710

California Public Utility Commission
770 L St.
Sacramento, CA 95812

California Department of Parks and Recreation
Office of Historic Preservation
1416 9th Street, Room 1442
Sacramento, CA 95814

California Highway Patrol
4040 Buck Owens Blvd.
Bakersfield, CA 93308-4930

California Regional Water Quality Control Board
Central Valley Region 5
1685 E. Street
Fresno, CA 93706

Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

Local/Regional Agencies

San Joaquin Valley Air Pollution Control District
Southern Region
34946 Flyover Court
Bakersfield, CA 93308

County of Kern
Planning and Community Development
Lorelei H. Oviatt, ACIP, Director
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County of Kern
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1401 19th Street, Suite 300
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10814 Rosedale Highway
Bakersfield, CA 93312

Mr. Doug Greener
Deputy Fire Chief
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Mr. Benny Wofford
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Kern County Fire Department
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Mr. Dennis Scott
Assistant Superintendent
Kern High School District
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Mr. Al Capilla
Assistant Superintendent
Bakersfield City School District
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Bakersfield, CA 93305

Elected Officials

Office of U.S. Senator Dianne Feinstein
2500 Tulare Street, Suite 4290
Fresno, CA 93721

Office of U.S. Senator Barbara Boxer
2500 Tulare Street, Suite 5290
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Congressman Jim Costa, 20th District
Bakersfield District Office
2700 “M” Street, Suite 225
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Congressman Kevin McCarthy, 22nd District
Bakersfield District Office
4100 Empire Drive, Suite 150
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Senator Jean Fuller
18th District of California
5701 Truxtun Avenue, Suite 150
Bakersfield, CA 93309

Shannon L. Grove, 32nd Assembly
Bakersfield District Office
4900 California Ave., Suite 100 B
Bakersfield, CA 93309

Board of Supervisors

County of Kern Board of Supervisors
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Bakersfield, CA 93301

Joe McQuiston, District 1
County of Kern Board of Supervisors
1115 Truxtun Avenue, 5th Floor
Bakersfield, CA 93301

Zack Scrivner, District 2
County of Kern Board of Supervisors
1115 Truxtun Avenue, 5th Floor
Bakersfield, CA 93301

Mike Maggard, Chairman, District 3
County of Kern Board of Supervisors
1115 Truxtun Avenue, 5th Floor
Bakersfield, CA 93301

Ray Watson, District 4
County of Kern Board of Supervisors
1115 Truxtun Avenue, 5th Floor
Bakersfield, CA 93301

Karen Goh, District 5
County of Kern Board of Supervisors
1115 Truxtun Avenue, 5th Floor
Bakersfield, CA 93301

City Council

City of Bakersfield
Attn: Harvey Hall, Mayor
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: Rudy Salas, Councilmember, Ward 1
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: Sue Benham, Councilmember, Ward 2
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: Ken Weir, Councilmember, Ward 3
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: David Couch, Ward 4, Vice Mayor
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: Harold Hanson, Councilmember, Ward 5
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: Jacquie Sullivan, Councilmember, Ward 6
1600 Truxtun
Bakersfield, CA 93301

City of Bakersfield
Attn: Russell Johnson, Councilmember, Ward 7
1600 Truxtun
Bakersfield, CA 93301

Planning Commissioners

City of Bakersfield
City Hall North
City Clerk's Office
Attn: David Strong, Ward 1
Planning Commission
1600 Truxtun Avenue
Bakersfield, CA 93301

City of Bakersfield
City Hall North
City Clerk's Office
Attn: Elliott Kirschenmann, Ward 2
Planning Commission
1600 Truxtun Avenue
Bakersfield, CA 93301

City of Bakersfield
City Hall North
City Clerk's Office
Attn: Dr. Dean Haddock, Ward 3
Planning Commission
1600 Truxtun Avenue
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City of Bakersfield
City Hall North
City Clerk's Office
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1600 Truxtun Avenue
Bakersfield, CA 93301

City of Bakersfield
City Hall North
City Clerk's Office
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1600 Truxtun Avenue
Bakersfield, CA 93301

City of Bakersfield
City Hall North
City Clerk's Office
Attn: Jeffrey G. Tkac, Ward 6
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1600 Truxtun Avenue
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City of Bakersfield
City Hall North
City Clerk's Office
Attn: Andy Stanley, Ward 7
Planning Commission
1600 Truxtun Avenue
Bakersfield, CA 93301

Schools

Margaret Gallegos, Principal
Thorner Elementary School
5501 Thorner Street
Bakersfield, CA 93306

Ruscel Reader, Principal
Cesar E. Chavez Science Magnet School
4201 Mesa Marin Drive
Bakersfield, CA 93306

Organizations

Museums

Jeff Nichol, Interim Museum Director
Kern County Museum
3801 Chester Avenue
Bakersfield, CA 93301

West Kern Oil Museum
1168 Wood Street
Taft, CA 93268

Tribes

Santa Rosa Rancheria
Clarence Atwell, Chairperson
PO Box 8
Lemoore, CA 93245

Kawaiisu Tribe
David Laughinghorse Robinson
PO Box 20849
Bakersfield, CA 93390

Ron Wermuth
P.O. Box 168
Kernville, CA 93238

Kitanemuk & Yowlumne Tejon Indians
Dee Dominguez
981 N. Virginia
Covina, CA 91722

Tejon Indian Tribe
Kathy Montes-Morgan, Chairperson
2234 4th Street
Wasco, CA 93280

Tejon Indian Tribe
Ernie Garcia
23437 Via Gayon
Valencia, CA 91355

Kenneth Woodrow
1179 Rock Haven Ct.
Salinas, CA 93906

Tejon Indian Tribe
Kathy Van Meter
Cultural Resource Team Leader
14035 Rosedale Hwy. #112
Bakersfield, CA 93314

Tejon Indian Tribe
Ernie Garcia
23437 Via Gayon
Valencia, CA 91355

Eshom Valley Band of Indians
Kenneth Woodrow
1179 Rock Haven Ct.
Salinas, CA 93906

Tejon Indian Tribe
Kathy Van Meter
Cultural Resource Team Leader
14035 Rosedale Hwy. #112
Bakersfield, CA 93314

Kudzubitcwanap Palap Tribe
Robert L. Gomez, Jr.
2619 Driller Ave.
Bakersfield, CA 93306

Eshom Valley Band of Indians
Kenneth Woodrow
1179 Rock Haven Ct.
Salinas, CA 93906

Chumash Council of Bakersfield
James R. Leon, Chairperson
P.O. Box 902
Bakersfield, CA 93303

Kern Valley Indian Council
Robert Robinson, Historic Preservation Officer
P.O. Box 401
Weldon, CA 93283

Tubatulabais of Kern Valley
Donna Begay, Tribal Chairwoman
P.O. Box 226
Lake Isabella, CA 93240

Chumash Council of Bakersfield
Ms. Arianne Chow-Garcia
1317 S Chester Avenue
Bakersfield, CA 93304

Tule River Indian Reservation
Ryan Garfield, Chairman
P.O. Box 589
Porterville, CA 93258

Historical Societies

Chairperson
Historic Preservation Commission
City of Bakersfield Economic & Community Development
1600 Truxtun Avenue, Suite 300
Bakersfield, CA 93301

Lori Wear, President
Kern County Historical Society
P.O. Box 141
Bakersfield, CA 93302

Kern Genealogical Society
PO Box 2214
Bakersfield, CA 93303

Utilities

Water Service

East Niles CSD
Tim Ruiz
P.O. Box 60388
Bakersfield, CA 93386

Oildale Mutual Water Company
Doug Nunneley, Chairman
P. O. Box 5638
Bakersfield, CA 93388

North of the River Municipal Water District
Bill Miller
4000 Rio Del Norte Street
Bakersfield, California 93308

Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

California Water Service Co.
3725 South H Street
Bakersfield, CA 93304

Vaughn Water Company
10014 Glenn Street
Bakersfield, Ca 93312-2763

Wastewater

Waste Management Department
Kern County Public Services Building
2700 “M” Street, Suite 500
Bakersfield, CA 93301

Gas

Pacific Gas and Electric (PG&E)
1918 H Street
Bakersfield, CA 93301-4319

Wastewater Division
6901 McCutchen Road
Bakersfield, CA 93313

Southern California Gas Company
3701 Pegasus Drive #114
Bakersfield, CA 93308-6843

Electric

Pacific Gas and Electric (PG&E)
1918 H Street
Bakersfield, CA 93301-4319

Telecommunications

American Telephone and Telegraph
Communication (AT&T)
5101 Office Park Drive #303
Bakersfield, CA 93309-0615

Time Warner Cable
3600 Sillect Avenue
Bakersfield, CA 93308

Appendix A California Environmental Quality Act Checklist

The following checklist identifies physical, biological, social, and economic factors that might be affected by the project. The California Environmental Quality Act impact levels include “potentially significant impact,” “less than significant impact with mitigation,” “less than significant impact,” and “no impact.”

Supporting documentation of all California Environmental Quality Act checklist determinations is provided in Chapter 2 of this document. Documentation of “No Impact” determinations is provided at the beginning of Chapter 2. Discussion of all impacts, avoidance, minimization, and/or mitigation measures is under the appropriate topic headings in Chapter 2.

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, 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 significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm-water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Result in inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
X. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
(f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING: Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
XIV. PUBLIC SERVICES:				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

	Potentially significant impact	Less than significant impact with mitigation	Less than significant impact	No impact
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Appendix B Resources Evaluated Relative to the Requirements of Section 4(f)

This section of the document discusses parks, recreational facilities, wildlife refuges and historic properties found within or adjacent to the project area that, due to the following, do not trigger Section 4(f) protection: 1) they are not publicly owned; 2) they are not open to the public; 3) they are not properties eligible for the National Register of Historic Places; 4) the project does not permanently use the property and does not hinder the preservation of the property; or 5) the proximity impacts do not result in constructive use.

Potentially Affected Facility

Solera Gardens Park is identified as a neighborhood park, local park, city park and an amenity. The park is at 6010 Miramonte Drive is within the project vicinity near the gated Solera community south of State Route 178 along Miramonte Drive.

Accessibility

Access to Solera Gardens Park from the project area is via Miramonte Drive. The proposed project would improve the operation of the State Route 178 and Miramonte Drive intersection. Access to the park would be made easier.

Impacts

Because the park is substantially removed from the state highway and a portion of the Solera Gardens subdivision development is between the highway and the park, there would be no visual, noise, air quality, water quality, wildlife, or vegetation impacts to the park.

Conclusion

With no impacts to Solera Gardens Park, Section 4(f) does not apply.

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Appendix C Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
OFFICE OF BUSINESS AND ECONOMIC OPPORTUNITY
1823 14TH STREET
SACRAMENTO, CA 95811
PHONE (916) 324-0449
TOLL FREE (866) 810-6346
FAX (916) 324-1949
TTY 711

Flex your power!
Be energy efficient!

March 1, 2011

Will McClure, Equal Opportunity Specialist
Federal Highway Administration
650 Capitol Mall, Suite 4-100
Sacramento, CA 95814

Dear Mr. McClure:

Enclosed is the California Department of Transportation's (Caltrans) Title VI Program Annual Element Update report for Federal Fiscal Year (FFY) 2010. This report supplements Caltrans Title VI Program Plan, provides information on accomplishments by Caltrans Districts and Divisions with Title VI components for FFY 2010 and goals for the current FFY 2011. The report was prepared in accordance with 23 Code of Federal Regulations, Part 200, Section 200.9 (b).

If you have any questions or need further information, please contact Sherri Gastinell, Chief, External Equal Opportunity Program, at (916) 324-8399, or by email at sherri_gastinell@dot.ca.gov.

Sincerely,

OLIVIA FONSECA
Deputy Director

Enclosure

c: Sherri Gastinell, Chief, External Equal Opportunity Program
Derrin J. Jourdan, Civil Rights Officer, Federal Transit Administration

"Caltrans improves mobility across California"

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Appendix D Minimization and/or Mitigation Summary

This appendix summarizes the minimization and/or mitigation measures described in the avoidance, minimization and/or mitigation sections for the respective categories.

Parks and Recreational Facilities

- PR-1—Purchase and install four electronic scoreboards
- PR-2—Replace all trees, shrubs, and grass removed as part of the highway project
- PR-3—Relocate the baseball monument at the entrance to a place outside the proposed right-of-way
- PR-4—Install decorative retaining walls along the State Route 178 widening project and the baseball park
- PR-5—Reconstruct all sidewalk and fencing removed as part of the highway project
- PR-6—Install higher or add to fence netting to protect motorists from errant softballs
- PR-7—Relocate the main irrigation supply at the northeast side of the park
- PR-8—Maintain access to State Route 178 following the State Route 178 Access Management Plan between Canteria Road/Bedford Green Drive and Miramonte Drive

Relocations and Real Property Acquisition

- RA-1—The existing sidewalk along the southern edge of State Route 178 will be reconstructed within the right-of-way being acquired from the park and restaurant.
- RA-2—Any impacts to landscaping and irrigation adjacent to the acquired right-of-way will be replaced and repaired.
- RA-3—The restaurant parking area will be reconfigured to allow continued access.

Utilities/Emergency Services

- UE-1—Prior to construction of the proposed project, Caltrans will coordinate with local emergency service agencies and prepare an Emergency Access Plan for their review. The plan will be used during project construction to maintain adequate emergency response times through the project study area.
- UE-2—Prior to construction of the proposed project, a Traffic Management Plan will be prepared by Caltrans in consultation with the city and all emergency service providers within the project study area.

Traffic and Transportation/Pedestrian and Bicycle Facilities

- T-1—A Traffic Management Plan will be prepared and submitted by Caltrans to the City of Bakersfield for review and approval prior to the initiation of construction. The plan would include the following elements: public information/public awareness; designation of haul routes for construction-related trucks; the location of access to the construction site; driveway turn restrictions; temporary traffic control devices or flagmen; travel time restrictions for construction-related traffic to avoid peak travel periods on selected roadways; and designated parking and staging areas for workers and equipment.
- T-2—A Construction Zone Enhanced Enforcement Program may be appropriate during project construction. The program involves the presence at all times of the California Highway Patrol in construction zones to remind motorists to slow down and use caution when traveling through work areas. The Caltrans Construction Division would be consulted to determine if a Construction Zone Enhanced Enforcement Program should be prepared and implemented. The Caltrans Construction Division should be consulted regarding requirements for the program.

Visual/Aesthetics

- VIS-1—The contractor will be required to maintain good housekeeping in and around construction sites, staging areas, and equipment storage areas.
- VIS-2—Where feasible and applicable, the contractor will be required to screen or locate equipment, construction materials, and debris in areas that are not visible to area residents and motorists.
- VIS-3—Where nighttime construction lighting is required, the contractor will, where feasible and applicable, use measures that reduce glare and spillover light.

To enhance the proposed detention basins, the proposed project would use the following measures where feasible and applicable:

- VIS-4—Avoid geometric shapes by undulating detention basins to have a more natural appearance
- VIS-5—Use black vinyl-coated fencing or similar fencing material to reduce the view of the fence surrounding the detention basins
- VIS-6—Select hydroseed material that is native to the area or matches the existing vegetation
- VIS-7—Screen basins from key viewers (motorists and residents) by using native plant materials or similar material to blend with surroundings

To reduce the visual effects of cut and fill slopes exceeding 5 feet in height, the proposed project would use the following measures:

- VIS-8—Round slopes where applicable
- VIS-9—Vary slopes from 2:1 to 4:1 where feasible
- VIS-10—Use native plant materials for erosion control within disturbed areas or match to blend with surrounding plant materials..

Cultural Resources

- CR-1—If cultural materials are discovered during construction, all earthmoving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.
- CR-2—If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities must cease in any area or nearby area suspected to overlie remains. The resident engineer, in addition to the District 6 Native American Liaison, will immediately notify the county coroner. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission. The commission will then select a Most Likely Descendent and notify the resident engineer and District 6 Native American Liaison of the selection. The District 6 Native American Liaison will work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code Section 5097.98 are to be followed as applicable.

Hydrology and Floodplain

- HF-1—A temporary erosion and sediment control plan will be prepared and used during construction.
- HF-2—Best management practices will be used to control storm-water flows in the construction zone.

Paleontology

Paleontological monitoring should take place for construction work below 5 feet such as constructing drainage basins and earthwork that results in cut or fill slopes exceeding five feet in depth that includes, but is not limited to the following measures (refer to the *Paleontological Identification and Evaluation Report and Mitigation Plan* (2011) for additional details of the Paleontological Mitigation Plan):

- PA-1—A qualified principal investigator for paleontology must be retained to provide professional services. The principal investigator will meet the qualifications as outlined in the Caltrans Standard Environmental Reference (Volume 1, Chapter 8) and use the mitigation plan, and maintain professional work standards. The principal investigator will have the project team include a qualified field supervisor and qualified monitors.
- PA-2—The resident engineer will notify the paleontologist if work will be deeper than five feet within any project area. Notification will be at 24 hours in advance. If any fossil discoveries occur when the paleontological team is not present, established procedures will protect the find by isolating the discovery with lath and flagging and moving construction excavation activities a minimum of 25 feet from the discovery.
- PA-3—Fossils observed during work will be treated differently depending on type and circumstance. Generally, discovery of identifiable invertebrate (shells and crustaceans) fossils requires a scientifically significant sample be collected for identification and analysis and that the location be documented. Similar procedures are followed for microvertebrates such as rodents. Current professional standards call for testing 200-pound samples (four to five full five-gallon buckets) from each location, followed by processing up to 6,000 pounds of matrix if significant fossils are recovered during testing. All locations must be documented. If larger fossils are observed, they must be evaluated to determine their condition and to determine if the fossils are sufficiently well preserved to meet preliminary significance criteria. Discovery of a bone bed or other type of fossil site containing multiple large fossils will likely require a formal stop-work order. Depending on the formations affected, additional samples may be collected that include specimens for dating analyses or materials for microfossil, botanical or pollen analyses.
- PA-4—The paleontologist will contact the resident engineer regarding time needed to recover fossils from unanticipated discoveries. The resident engineer will make final decisions regarding formal suspend-work orders.
- PA-5—Daily documentation is required for all members of the paleontology team includes observations of sediment type and distribution, fossil observations, fossil collection, and other information. Fossil locations should be recorded as precisely as possible. A high-resolution, resource-grade global position system (GPS) is required. The paleontologist is responsible for photographing activities, sediments and paleontological resources for documentation purposes, and filling out a Photograph Record Sheet for each digital roll. Paperwork and photographs will be submitted at the end of each week to the principal paleontologist. All documentation will be filed and maintained by the principal paleontologist and submitted to the repository along with any significant fossils upon completion of the project.

- PA-6—A weekly summary will be submitted to the resident engineer by e-mail or fax for all weeks in which paleontological work occurs. If fossils are recovered, additional documentation regarding laboratory work will also be incorporated into the weekly summary. These records and the field notes will be used to prepare a monthly letter report. The monthly reports will summarize the activities of the previous period, discoveries made, progress of laboratory work, incidents, and actions taken. No later than one month after the conclusion of earthmoving, a final report will be submitted to the repository, Caltrans, and the City of Bakersfield.
- PA-7—The Museum of Paleontology at the University of California at Berkeley will be the repository for recovered fossils. Their policy for accepting collections requires that all project paleontology data accompany the specimens. Ownership will be transferred from the Caltrans to the museum, as both are state agencies. Project funds will be allocated to pay costs for transporting, curating, and housing the collection.

Hazardous Waste or Materials

- HAZ-1—Surface and near-surface soil sampling for pesticides and herbicides should be conducted along the shoulders of State Route 178 to determine proper removal, handling, and disposal requirements. All soil sampling for pesticides and herbicides should be conducted during the Build Alternative design phase.
- HAZ-2—During construction of the Build Alternative, testing, removal, and disposal of any yellow traffic striping and pavement-marking materials should be conducted in accordance with the Caltrans Standard Special Provision for Hazardous Waste and Restricted Materials. Removal of yellow paint striping may require transport and disposal to a class 1 landfill. Depending on the method of removal, appropriate Standard Special Provisions shall be provided regarding handling, transport, and disposal of traffic stripe/pavement marking-generated waste.
- HAZ-3—The appropriate Caltrans Standard Special Provision should be edited based on the level of lead concentration found during testing and the method of removal and should indicate the appropriate testing criteria and disposal of generated waste.
- HAZ-4—A Lead Compliance Plan under Section 7-1.07, Lead Compliance Plan, of the Standard Specifications, will be required to address health and safety for workers during construction. Special handling, treatment, or disposal of aerially deposited lead in soils during construction activities shall be consistent with the Department of Toxic Substance Control Lead Variance (No. VO9HQSCD006) dated July 1, 2009.

- HAZ-5—All wooden utility poles and other treated wood waste material that will be removed or relocated as part of the project should be tested for wood treatments/preservatives such as creosote and pentachlorophenol during the Build Alternative design phase. Prior to and during construction, all treated wood waste must be properly disposed of at a wood waste disposal facility approved by California DTSC, Chapter 34, Article 1, Alternative Management Standards for Wood Treated Waste. In addition, the contractor shall ensure that any personnel who come in contact with treated wood waste or contaminated soils will follow all applicable requirements under Caltrans SSP 14-010 for treated wood waste and Titles 8 and 22 Section 34, §67386.1 through §67386.12 (Alternative Management Standards for Treated Wood Waste) of the CCR and be trained in the proper identification, disposal, and safe handling of treated wood waste and contaminated soils.
- HAZ-6—Prior to the start of construction, the contractor shall prepare a plan that will include provisions for emergency response in the event that unidentified underground storage tanks, hazardous materials, petroleum hydrocarbons, or hazardous or solid wastes are discovered during construction activities. The plan will address underground storage tank decommissioning, field screening, contaminant materials testing methods, mitigation and contaminant management requirements, and health and safety requirements for construction workers. If an unexpected release of hazardous substances is found in reportable quantities, the contractor shall notify the National Response Center by calling 1-800-424-8802. Any requisite remediation will be performed in accordance with the applicable federal, state, or local regulations and requirements.
- **HAZ**-7 – Before construction, the utility company shall be notified to ensure that the locations of underground transmissions lines and facilities are marked. In addition, Underground Service Alert of Southern California shall be conacted at least two working days before subsurface excavation.

Air Quality

- AQ-1—Mitigate 20 percent of total nitrogen oxide emissions and 45 percent of total Particulate Matter$_{10}$ (PM_{10}) exhaust emissions from construction equipment greater than 50 horsepower. Emissions can be reduced by using less-polluting construction equipment with add-on controls, cleaner fuels, or newer equipment.
- AQ-2— Pay off-site emission reduction fees for construction activities (Rule 9510 Section 7 of the San Joaquin Valley Air Pollution Control District Regulation IX—Mobile and Indirect Sources).

- AQ-3—All disturbed areas, where needed, including storage piles, not being actively used for construction purposes, would be stabilized for dust emissions by applying water or chemical stabilizer/suppressant.
- AQ-4— All on-site unpaved roads and off-site unpaved access roads, where needed, will be stabilized for dust emissions using water or chemical stabilizer/suppressant.
- AQ-5—All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities will be effectively control fugitive dust emissions by applying water or by presoaking.
- AQ-6—When materials are transported off-site, all material will be covered or effectively wetted to limit visible dust emissions. At least six inches of freeboard space will be maintained from the top of the load to the top of the container.
- AQ-7—All operations will limit or immediately remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit visible dust emissions; blower devices are also expressly forbidden.)
- AQ-8—Within urban areas, track-out will be removed at the end of each workday, where appropriate, when it extends 50 feet or more from the site.
- AQ-9—Sites with 150 or more vehicle trips per day will prevent carryout and track-out.
- AQ-10—Traffic speeds on unpaved roads will be limited to 15 miles per hour.
- AQ-11—Sandbags or other erosion control measures will be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- AQ-12—Wheel washers will be installed for all exiting trucks or all trucks and equipment leaving the site will be washed off.
- AQ-13—Wind breaks will be installed at windward side(s) of construction areas.
- AQ-14—Excavation and grading activities will be suspended when winds exceed 20 miles per hour.
- AQ-15—At any one time, excavation, grading, and other construction activity areas will be limited.
- AQ-16—Alternative fueled or catalyst equipped diesel construction equipment will be used.
- AQ-17—Idling time will be minimized (e.g., 10 minute maximum).

- AQ-18—The hours of operation of heavy duty equipment and/or the amount of equipment in use will be limited.
- AQ-19—Fossil-fueled equipment will be replaced with electrically driven equivalents, provided a portable generator set does not run the equivalent machinery.
- AQ-20—Construction will be curtailed during periods of high ambient pollutant concentrations; this may include stopping construction activity during the peak-hour of vehicular traffic on adjacent roadways.
- AQ-21—Activity management will be used (e.g., rescheduling activities to reduce short-term impacts).

Noise

- N-1—Conform to Caltrans Standard Specifications, Section 14-8.02, Sound Control Requirements. This specification requires the contractor to comply with all local sound control and noise level rules, regulations, and ordinances that apply to any work performed pursuant to the contract.
- N-2—Conform to Caltrans Standard Special Provisions, Section S5-310, Sound Control Requirements. This provision applies to work in a residential or urban area at night. The provisions are also required if night or Sunday noise restrictions apply to the project.
- N-3—Each internal combustion engine used for any purpose on the job, or related to the job, would be equipped with a muffler of a type recommended by the manufacturer.
- N-4—No internal combustion engine would be operated on the project without manufacturer-recommended muffler.
- N-5—Equipment and staging areas would be as far from homes as possible.
- N-6—Appropriate additional noise minimization measures would be used, including relocating stationary construction equipment away from sensitive receptors, turning off idling equipment, rescheduling constriction activity, notifying adjacent residents in advance of construction, and installing acoustic barriers around stationary construction noise sources.
- N-7—Construction activity would be from 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 6 p.m. on weekends where building activities would be near sensitive receptors.

Biological Resources—Natural Communities

Valley Saltbush Scrub and Coastal and Valley Freshwater Marsh

- NC-1—Construction employees will strictly limit their activities, vehicles, equipment, and construction materials to the project footprint, designated staging areas, and routes of travel. The construction area(s) will be fenced using orange flagging, and environmentally sensitive areas will be specified in the construction plans. Construction limits adjacent to coastal and valley freshwater marsh and valley saltbush scrub will be identified using orange environmentally sensitive area fencing. The flagging will be maintained until completion of all construction activities. Employees will be instructed that their activities are restricted to the construction areas. Access to sites will be via pre-existing access routes to the greatest extent possible. Monitoring personnel will review the project area prior to initiation of construction activities.
- NC-2—A Worker Environmental Awareness Program will be established and implemented prior to construction. The program will be presented by a qualified biologist. At a minimum, the program will cover the distribution of natural communities of special concern, special-status species, general behavior and ecology of these species, their sensitivity to human activities, their legal protection, the penalties for violation of state and federal laws, reporting requirements, project mitigation measures, and measures to implement in the event that this species is found during construction. A fact sheet containing this information will also be prepared and distributed. The program will be presented to all members of the construction crew prior to the start of project construction activities. New employees will receive formal, approved training prior to working onsite.
- NC-3—Upon completion of the orientation, employees would sign a form stating that they attended the program and understand all protection measures. These forms must be filed with Caltrans and the City of Bakersfield and would be made available to U.S. Fish and Wildlife Service and California Department of Fish and Game upon request.
- NC-4—Direct impacts on 0.05 acre of freshwater marsh must be mitigated adequately through a contribution to a Regional Water Quality Control Board-approved or California Department of Fish and Game-approved mitigation bank or payment of approved in-lieu fees. A total of 0.05 acre (1:1 ratio) of credits would mitigate the impacts. This is the same mitigation recommended in the Screencheck Preliminary Wetland Delineation and Assessment Report (2011). The exact location of the compensatory mitigation will be determined during the anticipated permitting process with the California Department of Fish and Game and Regional Water Quality Control Board.

- NC-5—The permanent loss of 0.36 acre of valley saltbush scrub would be mitigated by participating in the Metropolitan Bakersfield Habitat Conservation Plan. Sufficient funding will be paid to the Metropolitan Bakersfield Habitat Conservation Trust Group to purchase 1.08 acres of habitat at a 3 to 1 compensation ratio).

Wetlands

- W-1—Impacts on 0.05 acre of waters of the United States can be mitigated through contributions to a U.S. Army Corps of Engineers and Regional Water Quality Control Board-approved mitigation bank or payment of approved in-lieu fees. A minimum of 0.05 acre (1 to 1 ratio) of acquired credits would mitigate the impacts on the 0.05 acre of waters of the United States.

Plant Species

- PS-1—Prior to construction activities, a qualified biologist will conduct a preconstruction plant survey in accordance with the most current protocols approved by U.S. Fish and Wildlife Service and California Department of Fish and Game to ensure no special-status plants will be directly impacted by the project. If special status plants are observed, they will be avoided to the extent feasible. If avoidance is not feasible, conservation requirements will be discussed with U.S. Fish and Wildlife Service and California Department of Fish and Game.
- PS-2—Areas adjacent to the project construction area containing individual Bakersfield cactus will be designated as an environmental sensitive area and avoided by a minimum of 15 feet from the individual cactus to ensure no impacts to the plants occur during construction activities. In addition, signs will be posted identifying the area. A biological monitor will be present during all initial surface disturbance activities. In addition, the biological monitors will regularly inspect construction work, including a once daily monitoring of road construction activities. Qualified biological monitors will have authority to immediately stop any activity to avoid the take or destruction of an individual of a special-status species, if any are present.
- PS-3—The contractor will place storm-water drainages and culverts in areas that will not adversely affect the area within or surrounding known locations of special-status plant species.
- PS-4—A Worker Environmental Awareness Program will be established and implemented prior to construction. The program will be presented by a qualified biologist. At a minimum, the program will cover the distribution of natural communities of special concern, special-status species, general behavior and ecology of these species, their sensitivity to human activities, their legal protection, the penalties for violation of

state and federal laws, reporting requirements, project mitigation measures, and measures to implement in the event that this species is found during construction. A fact sheet containing this information will also be prepared and distributed. The program will be presented to all members of the construction crew prior to the start of project construction activities. New employees will receive formal, approved training prior to working on-site. Upon completion of the Worker Environmental Awareness Program, employees would sign a form stating that they attended the program and understand all protection measures. These forms would be filed with Caltrans and the City of Bakersfield and would be made available to U.S. Fish and Wildlife Service and California Department of Fish and Game upon request.

Animal Species

Burrowing Owl

- AS-1—The permanent loss of 79.85 acres (34.15 acres of ruderal habitat, 45.07 acres of nonnative grassland, and 0.36 acre of valley saltbush scrub) under the Build Alternative associated with burrowing owl is considered a direct impact. Implementation of compensatory mitigation associated with the Metropolitan Bakersfield Habitat Conservation Plan (a minimum of 3 to 1 acres of credit for permanent habitat lost and a 1 to 1 acre of credit for temporary loss of habitat) will mitigate the loss of habitat.
- AS-2—A qualified biologist, using the California Department of Fish and Game (1995) and California Burrowing Owl Consortium (1993) guidelines, will perform burrowing owl surveys 30 days prior to ground disturbance. The preconstruction survey will include the project area and a 300-foot buffer if between February 1 and August 31 (nesting season) or a 100-foot buffer if outside this window.
- AS-3—If burrowing owls are observed during the preconstruction survey, they must be avoided by a minimum of 160 feet during the non-breeding season (September 1 through January 31) or a minimum 250 feet during the breeding season (February 1 through September 15) and then relocated once the nesting season is complete, with coordination from the wildlife agencies particularly California Department of Fish and Game.
- AS-4—On-site passive relocation by a qualified biologist will take place if occupied burrows cannot be avoided. If nesting burrowing owls are found, either (1) construction disturbance cannot occur within 250 feet of the active burrow(s) until it is confirmed by a qualified ornithologist that the pair is no longer nesting and the young (if present) are independently foraging or (2) active relocation by a properly permitted biologist is performed, with concurrence from the California Department of Fish and Game and U.S. Fish and Wildlife Service.

Loggerhead Shrike

- AS-5—The potential for loggerhead shrike nesting is low, but it is recommended that precautions be taken to prevent the destruction of a nest. Clearing and grubbing of natural areas will take place outside the active nesting period (February 1 through September 15). If clearing and grubbing are required during this period, a preconstruction nesting bird survey will be required no more than 7 days prior to vegetation removal. Any documented active nests will require a 250-foot buffer where no construction activity will be permitted until the nesting is complete (failed or young have fledged). The radius of the buffer area may be reduced based on California Department of Fish and Game approval for the nesting species. A worker Environmental Awareness Program will also be established and implemented prior to construction.
- AS-6—Proposed mitigation for San Joaquin kit fox and blunt-nosed leopard lizard will serve to offset effects to the loggerhead shrike. Compensatory mitigation will not be needed if nesting habitat is avoided or construction is done outside the nesting season.

Threatened and Endangered Species

Blunt-nose leopard lizard

- ES-1—Preconstruction surveys would be conducted within the biological study area within 30 days prior to construction. If blunt-nosed leopard lizard is observed within the biological study area, U.S. Fish and Wildlife Service and California Department of Fish and Game would be contacted to discuss ways to proceed with the project and avoid take to the maximum extent practical.
- ES-2—A Worker Environmental Awareness Program for construction personnel would be required before construction begins. The program would state their responsibilities in regard to blunt-nosed leopard lizard: locations of environmentally sensitive areas, exclusion zones, timing constraints, and communication with biological monitors.
- ES-3—During preconstruction surveys, if blunt-nosed leopard lizards are found to be in the project impact area, exclusionary fencing would be installed and maintained throughout construction.
- ES-4—Burrows that may be used by blunt-nosed leopard lizards would be avoided to the greatest extent practicable.
- ES-5—Initial surface disturbing actions that occur during the active blunt-nosed leopard lizard season would be monitored by a qualified biologist. Surface disturbing actions in potentially suitable habitat would be scheduled during the active season (about April 15 to October 15) when air temperatures are between 77° and 95° Fahrenheit to maximize

the lizard's ability to escape from slow-moving equipment and minimize the risk of accidental entombment in burrows.

- ES-6—An approved biologist would monitor initial surface disturbing activities within suitable blunt-nosed leopard lizard habitat.
- ES-7—To prevent inadvertent entrapment of blunt-nosed leopard lizards during construction, any trenches that are open during the active season would be surveyed in the morning and late afternoon hours to remove any blunt-nosed leopard lizards that fall into the trenches.

San Joaquin Kit Fox

- ES-8—Construction activities will adhere to the standard construction and operational requirements as described in the U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to and During Ground Disturbance (U.S. Fish and Wildlife Service 2011).
- ES-9—About 60 days before construction, a U.S. Fish and Wildlife Service- and California Department of Fish and Game-approved biologist will do a survey for San Joaquin kit fox dens within 200 feet of the construction footprint and utility relocations. A letter report and map of known and potential San Joaquin kit fox dens will be given to U.S. Fish and Wildlife Service and California Department of Fish and Game.
- ES-10—Pre-activity clearance surveys for San Joaquin kit fox will be repeated approximately two weeks before construction or after any delays in construction of over two weeks. Any new San Joaquin kit fox dens identified since completing the 60-day survey will be reported to U.S. Fish and Wildlife Service and California Department of Fish and Game in a letter report and map. If no new San Joaquin kit fox dens are identified, an internal record will be maintained that includes the survey date, designated biologist conducting the survey, and general survey findings. The records can be submitted to U.S. Fish and Wildlife Service and California Department of Fish and Game upon request.
- ES-11—Disturbance to all San Joaquin kit fox dens will be avoided to the maximum extent possible. If dens or potential dens are detected within the project footprint during 60-day and/or two-week pre-activity clearance surveys, agency permission will be requested to monitor and excavate dens that would be affected by the project. Active dens will not be excavated during the natal season (about January 1–June 14). The agency-approved biologist will monitor potential dens for three consecutive nights and submit monitoring results in a letter report to U.S. Fish and Wildlife Service and California Department of Fish and Game. The biologist will also oversee the excavation of

abandoned dens following approval by U.S. Fish and Wildlife Service and Department of Fish and Game.

- ES-12—Dens found within 200 feet of project construction not be affected by construction activities will be monitored and buffered by an exclusion zone as measured outwards from the den entrance or cluster of entrances; potential or atypical dens will be flagged by a 50-foot radius buffer, and known dens will be flagged by a 100-foot buffer. If natal/pupping dens are discovered within the action area or within 200 feet of the action area, the U.S. Fish and Wildlife Service will be notified immediately. The biologist will submit results of den excavation and exclusion in a letter report to U.S. Fish and Wildlife Service and California Department of Fish and Game.
- ES-13—The agency-approved biologist will conduct a Worker Environmental Awareness Program for all construction crews before ground-disturbing activities. The training is to inform construction crews of permit terms and conditions, plus the potential for San Joaquin kit fox to be affected by construction activities. The training will be repeated to all new crew members and annually to all crew members working in San Joaquin kit fox habitat. Following the training, crew members will sign a sheet stating that they attended the training and understand the protection measures and construction restrictions. Training materials and records of attendees will be submitted to U.S. Fish and Wildlife Service and California Department of Fish and Game.
- ES-14—The agency-approved biologist will monitor road construction activities once daily. The biologist will verify that construction complies with the measures laid out in the biological opinion, as well as construction and operation requirements described in U.S. Fish and Wildlife Service Standardized Recommendations for the Protection of the San Joaquin Kit Fox Prior to Ground Disturbance (U.S. Fish and Wildlife Service 2011).
- ES-15—The biologist will maintain a daily log that can be summarized and given to U.S. Fish and Wildlife Service and California Department of Fish and Game at their request.
- ES-16—Permeable fencing will be installed along the proposed State Route 178 right-of-way in all locations where new fencing is required. One or a combination of the following three design options may be adopted to provide San Joaquin kit fox with movement opportunities: elevating the bottom of the fence 5 inches above ground to allow unobstructed movement by San Joaquin kit fox under the fence; installing ground-level 8 x 8-inch-wide gaps no more than 100 feet apart for the length of the fence to allow San Joaquin kit fox movement at regular intervals along the right-of-way; and installing fencing with a minimum mesh size of 3½ x 7 inches (preferably 5 x 12 inches) that would allow unlimited movement by San Joaquin kit fox through the fence. Permeable fence

design, when implemented in conjunction with all project design modifications, is expected to reduce the potential to disrupt north-south San Joaquin kit fox movement in the project area.

- ES-17—The project proposes to retain existing culverts to the extent feasible; however, if modification (including extension) and/or replacement of the culverts are required to accommodate the proposed widening of the roadway, then the culverts should be designed in such a way as to increase the openness index to provide movement opportunities for the San Joaquin kit fox. Grating will be installed at the entrance to each culvert that is expected to serve as a crossing structure. Hinged iron grates within 6- x 6-inch grating are recommended, but the grating should be small enough to exclude San Joaquin kit fox predators.
- ES-18—A U.S. Fish and Wildlife Service- and California Department of Fish and Game -approved biologist will inspect culverts included in the project design modifications in the biological study area once annually during April and May for three years following construction to verify that access is not impeded by debris.
- ES-19—The permanent loss of San Joaquin kit fox habitat includes 45.07 acres of non-native grassland, 0.36 acre of valley saltbush scrub and up to 34.15 acres of ruderal habitat habitat that will be mitigated by participating in the Metropolitan Bakersfield Habitat Conservation Plan fee payment program. Fees will be paid at a ratio of 3 to 1 for a total of up to 238.74 acres of mitigation. Prior to construction, the limits of impacts would be verified and mapped by habitat type within those limits. The map would be submitted for approval from the U.S. Fish and Wildlife Service before submittal to the City of Bakersfield Planning Department for fee payment. See table below.

Compensatory Mitigation Ratios for Loss of Habitat

Habitat Type Affected	Proposed Compensatory Mitigation Ratios for Permanent Impacts	Permanent Impacts(Acreage)	Acreage to Mitigate with MBHCP[1]
Nonnative Grassland	Acquisition of habitat of similar or greater value at 3:1 ratio	45.07	135.21
Valley Saltbush Scrub	Acquisition of habitat of similar or greater value at 3:1 ratio	0.36	1.08
Ruderal Habitat	Acquisition of habitat at 3:1 ratio	34.15	102.45
Total Acreage to Mitigate with the Metropolitan Bakersfield Habitat Conservation Plan		79.58	238.74

[1]All impacts within the project area are considered permanent. No temporary impacts have been defined. MBHCP=Metropolitan Bakersfield Habitat Conservation Plan

Invasive Species

In compliance with Executive Order 13112 on Invasive Species and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project would not use species listed as noxious weeds. In areas of particular sensitivity, extra precautions would be taken if invasive species were found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies.

Project construction is expected to disturb the ground and remove both non-native and native vegetation. To minimize the spread of invasive plants and/or seeds during construction, the following measures would be implemented:

- IS-1—Construction equipment will be cleaned of mud or other debris that may contain invasive plants and/or seeds and inspected to reduce the potential of spreading noxious weeds to the project site and before leaving the site during the course of construction.
- IS-2—Trucks carrying vegetation will be covered and vegetation materials removed from the site will be disposed of in accordance with applicable laws and regulations.
- IS-3—During post-construction, any disturbed areas remaining as bare ground will be hydroseeded with a U.S. Fish and Wildlife Service- and California Department of Fish and Game-approved seed mix.
- IS-4—Reclamation of disturbed areas will be done as soon as possible following construction.
- IS-5—Fertilizer will not be applied to reclaimed areas with known weed infestations; nutrients can enhance the growth of weeds.
- IS-6—Straw bales used for sediment barriers or mulch will be certified weed-free.
- IS-7—Post-construction monitoring and treatment of weed infestation within the biological study area will be implemented as needed.

Appendix E Section 4(f) *De minimis* Concurrence

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 6
855 M STREET, SUITE 200
FRESNO, CA 93721-2716
PHONE (559) 445-6461
FAX (559) 445-6236
TTY (559) 488-4066

Flex your power!
Be energy efficient!

December 19, 2011

Ms. Dianne Hoover
Director of Recreation and Parks
City Hall North
1600 Truxton Avenue
Bakersfield, CA 93301

Dear Director Hoover,

State Route 178 Widening Project, Post Miles R8.4/T9.8 and 8.2/10.4
0600000075
Section 4(f) *De Minimis* Impacts Finding Concurrence Request

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

The California Department of Transportation (Caltrans) proposes to widen a 3.5 mile segment of State Route 178 from 0.68 mile east of Morning Drive at Post Mile R8.4/T9.8 to 0.20 mile east of Miramonte Drive at Post Mile 8.2/10.4 within northeast Bakersfield in Kern County, California. The project would increase traffic capacity and enhance mobility for future traffic demand in the area. The roadway widening and new retention/detention basins would require additional right of way.

The State Route 178 Widening project proposes one Build Alternative with two design variations and a No-Build Alternative. Design Variation 1 of the Build Alternative proposes to shift the roadway alignment north between Canteria Drive/Bedford Green Drive and Masterson Street. Design Variation 2 of the Build Alternative proposes to shift the roadway alignment south between Canteria Drive/Bedford Green Drive and Masterson Street. The alignment shift in this location is the only major design difference between the two variations with the main component affecting the Mesa Marin Sports Park (Sports Complex), a Section 4(f) resource. The southern alignment shift proposed under Design Variation 2 would require a sliver acquisition of approximately 14,600 square feet (0.33 acre) of land from the 40-acre Mesa Marin Sports Complex (Figure 2-5). An average of 12-feet of additional right-of-way would be required from the park to complete the proposed roadway improvements.

Because the Sports Complex is a public park, the approval of the project is subject to compliance with Section 4(f). Section 6009(a) of SAFETEA-LU amended Section 4(f) legislation at 23 USC

"Caltrans improves mobility across California"

138 and 49 USC 303 to simplify the processing and approval of projects that have only *de minimis* impacts on lands protected by Section 4(f). This revision provides that Caltrans, in coordination with the agency that has jurisdiction over a Section 4(f) resource, may make a Section 4(f) *de minimis* finding.

The purpose of this letter is to outline the rationale for a *de minimis* finding for the direct use of a portion of the Sports Complex property and to request concurrence from the City of Bakersfield, the park owner, with Caltrans' recommendation that a Section 4(f) *de minimis* impact finding is appropriate. Caltrans makes the recommendation pursuant to Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and the associated FHWA guidance dated December 13, 2005.

The area to be acquired includes currently vacant undeveloped land and landscaped areas outside of the softball fields, which are the primary recreational feature of the park. The existing sidewalk along the south edge of State Route 178 will be reconstructed within the right of way being acquired from the park to continue to provide safe pedestrian access to the park. The area of direct impact would not affect any of the essential features or attributes of the Sports Complex. The project would not adversely affect the softball fields, concession and restroom building, or access and parking. Any impacts to landscaping and irrigation adjacent to the acquired right-of-way would be repaired.

In addition, with the following mitigation/enhancement measures, the Sports Complex would be improved by the State Route 178 Widening Project:

- Purchase and install four electronic scoreboards
- Replace all trees, shrubs, and grass removed as part of the highway project
- Relocate the entrance baseball monument outside of the proposed right of way
- Install decorative retaining walls along the State Route 178 widening project and the baseball park
- Reconstruct all sidewalk and fencing removed as part of the highway project
- Install higher or add fence netting to protect motorists from errant baseballs
- Relocate the main irrigation supply at the northeast side of the park
- Maintain access to State Route 178 in accordance with the State Route 178 access management plan between Canteria Road/Bedford Green Drive and Miramonte Drive.

With the selection of Design Variation 2 of the Build Alternative, the transportation use of the Mesa Marin Sports Complex, as summarized above, does not adversely affect any of the activities, features, and attributes that qualify this portion of the Mesa Marin Sports Complex property for protection under Section 4(f). This letter indicates that the public will be afforded an opportunity to review and comment on this project, including its effects on the Mesa Marin Sports Complex property. This opportunity will be afforded during the 30-day public circulation and comment period of the Draft Environmental Document. A Public Notice will inform the public of the availability of the Draft Environmental Document as well as the date and time of an anticipated Public Hearing. All comments will be considered and the responses will be incorporated into the Final Environmental Document.

Because the project would not adversely affect the important recreational activities, attributes, and essential features of the park and because mitigation/enhancement measures listed above would be included as part of the project, Caltrans requests that the City of Bakersfield concur with a Section 4(f) *de minimis* finding for this project. We request your concurrence on City of Bakersfield letterhead by January 20, 2012.

Should you have questions concerning this matter, please call me at 559-445-6282.

Sincerely,

Bryan Apper
Senior Environmental Planner
Caltrans Environmental Division
Bakersfield TRIP Program
855 M Street, Suite 200
Fresno, CA 93721

Attachment: Mesa Marin Sports Complex Figure 2-5

c: Darin Budak, Assistant Parks Director

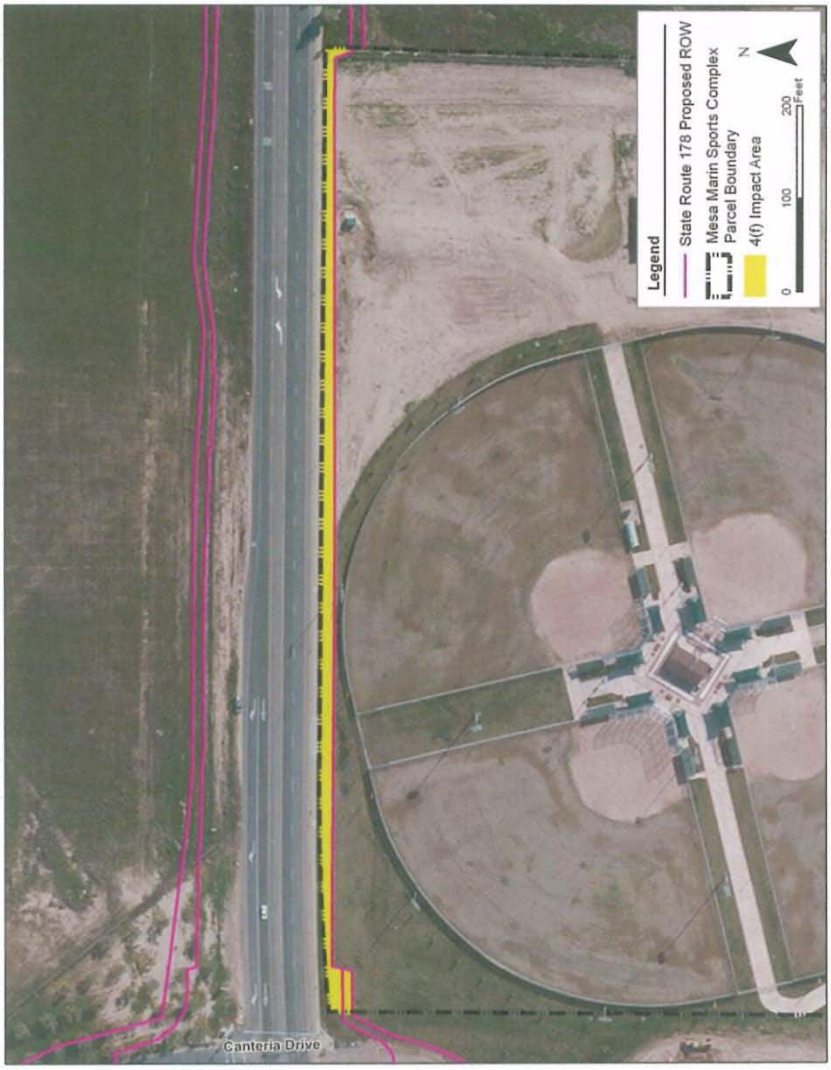

Figure 2-5 Use of Mesa Marin Sports Complex

BAKERSFIELD

DEPARTMENT OF RECREATION & PARKS

DIANNE HOOVER, DIRECTOR

January 20, 2012

Mr. Bryan Apper
Senior Environmental Planner
855 M Street, Suite 200
Fresno, CA 93

Subject: Section 4(f) Consultation for the Proposed State Route 178 Widening Project

Dear Mr. Apper,

The City of Bakersfield received Caltrans's letter dated December 19, 2010 requesting that the City of Bakersfield concur with a Section 4(f) *de mimimis* finding for the proposed State Route 178 Widening Project.

In response to Caltrans's letter dated December 19, 2010 identifying the Mesa Marin Sports Park as a Section 4(f) property with potential use effects under the proposed State Route 178 Widening Project, the City agrees that the short-term visual impacts (e.g. temporary views of construction activities and possible intrusion from nighttime lighting) associated with the project would not substantially impair the activities, features, or attributes of the Sports Complex that qualify the park for protection under Section 4(f). In addition, the City agrees that the project will not result in any constructive use impacts at the Sports Complex and a noise barrier is not necessary at this location. Therefore; City concurs with the California Department of Transportation's finding of a Section 4(f) *de mimimis*.

Sincerely,

Dianne Hoover

Dianne Hoover
Director of Recreation and Parks
City of Bakersfield

c: Theodore Wright, TRIP Program Manager
David Clark, TRIP Program Environmental Manager

City of Bakersfield · Department of Recreation & Parks · 1600 Truxtun Avenue, 3rd Floor
Bakersfield · California · 93301
(661) 326-3866 · Fax (661) 852-2140

Appendix F Special Status Species List from the United States Fish and Wildlife Service

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

September 29, 2011

Document Number: 110929103357

Mikael Romich
ICF International
1776 Park Avenue, Suite 146
Redlands, CA 92373

Subject: Species List for State Route 178 Widening Project

Dear: Mr. Romich

We are sending this official species list in response to your September 29, 2011 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be December 28, 2011.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 110929103357

Database Last Updated: September 18, 2011

Quad Lists

Listed Species

Invertebrates

Branchinecta lynchi
vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
valley elderberry longhorn beetle (T)

Fish

Hypomesus transpacificus
delta smelt (T)

Amphibians

Rana draytonii
California red-legged frog (T)

Reptiles

Gambelia (=Crotaphytus) sila
blunt-nosed leopard lizard (E)

Thamnophis gigas
giant garter snake (T)

Birds

Empidonax traillii extimus
southwestern willow flycatcher (E)

Mammals

Dipodomys nitratoides nitratoides
Tipton kangaroo rat (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Plants

Caulanthus californicus
California jewelflower (E)

Monolopia congdonii (=Lembertia congdonii)
San Joaquin woolly-threads (E)

Opuntia treleasei
Bakersfield cactus (E)

Pseudobahia peirsonii
San Joaquin adobe sunburst (T)

Quads Containing Listed, Proposed or Candidate Species:

RIO BRAVO RANCH (239A)

OIL CENTER (239B)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) Candidate - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) Critical Habitat designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be December 28, 2011.

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Appendix G State Historic Preservation Office Interagency Consultation Letter of Concurrence

Awaiting State Historic Preservation Officer concurrence letter determination.

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List of Technical Studies that Are Bound Separately

- Air Quality Study Report (May 2011)
- Archaeological Survey Report (July 2011)
- Biological Assessment (October 2011)
- Historical Property Survey Report (January 2012)
- Initial Site Assessment (February 2011)
- Location Hydraulic Study (May 2011)
- Final Natural Environment Study (September 2011)
- Noise Study Report (February 2011)
- Noise Abatement Decision Report (April 2011)
- Paleontological Resources: Paleontological Identification and Evaluation Report and Mitigation Plan (May 2011)
- Visual Assessment (July 2011)
- Water Quality Study Report (June 2011)
- Supplemental Archaeological Survey Report (February 2012)
- Wetland Delineation and Assessment Report (February 2012)
- Traffic Report (March 2011)
- Hydrology and Hydraulics Study Report (January 2012)
- Draft Project Report (February 2012)
- Draft Thomas Roads Improvement Program San Joaquin Kit Fox Effects Analysis, Mitigation Strategy, and Implementation Plan FINAL (March 2010)

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