

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

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This chapter describes the current state of the resources in the project area and identifies the potential impacts of implementing the proposed project. Each subsection describes the present conditions, discusses the potential impacts of building the Proposed Project, and indicates what measures would be taken to avoid or minimize those impacts.

The environmental analysis contained within the following chapter considers the potential environmental consequences associated with implementation of the three proposed alternatives, Alternative 1 (the No Build Alternative), and Build Alternatives 2 and 3. For the purposes of this analysis, the proposed Build Alternatives are analyzed concurrently where potential environmental impacts would be similar; however, where applicable, the Build Alternatives analyses are separated and discussed individually.

The environmental impact analyses discuss potential impacts in four general categories: human environment, physical environment, biological environment, and cumulative impacts. The following discussion of potential impacts is presented by environmental resource area. No impact discussion is provided in this chapter for the following topics due to the absence of these resources or the lack of impacts to these resources due to the Proposed Project:

- Farmlands/Timberlands: No farmlands or timberlands are located within the project area
- Coastal Zone: The Proposed Project is not located within a coastal zone
- Wild and Scenic Rivers: No wild and scenic rivers are located within project area
- Plant Species: No special-status plant species are present within the project area
- Threatened and Endangered Species: No state or federally listed species are present within the project area.

Refer to Appendix A, CEQA Checklist, for a summary of the determination of significance under the California Environmental Quality Act (CEQA) for potential environmental impacts associated with the Build Alternatives. This includes an analysis of the findings of significance for the topic areas.

Refer to Appendix C, Environmental Commitment Record, for a list of measures that would be implemented to avoid, minimize or mitigate environmental impacts.

## **2.1 Land Use**

This section describes the current and planned land uses for the project area and discusses potential direct and indirect land use impacts that could result from implementation of the proposed project. The section also examines the project's compatibility with adjacent land uses and consistency with applicable General Plans and regional plans.

The City of Anaheim (City) General Plan was reviewed to identify designated land uses, and planning policies and goals. Aerial photographs were examined to identify existing land uses, and the Southern California Association of Governments (SCAG) Draft 2008 Regional Comprehensive Plan was reviewed to identify general growth projections within the project area.

### **2.1.1 Existing and Future Land Uses**

#### **2.1.1.1 Existing Land Uses**

According to land use data provided by the City and site observations, land uses surrounding the project area include residential, recreation, commercial, light industrial, institutional, mixed-use, and nonresidential mixed uses. The existing land uses in the project area are shown in Figure 2.1-1

As shown in Figure 2.1-1, commercial uses are located on both the east and west sides of Tustin Avenue north of State Route 91 (SR-91). Mixed-use areas (consisting of residential, retail, service, entertainment, and office uses) are located north of these commercial use areas and east of the Orange County Transportation Authority (OCTA) Metrolink track, north of SR-91. Industrial uses straddle SR-91 in the western end of the study area. The southern portion of the study area contains flood control land uses and the Santa Ana River. The eastern end of the study area contains single-family residential uses to the east of SR-55 and high density residential to the west of SR-55.

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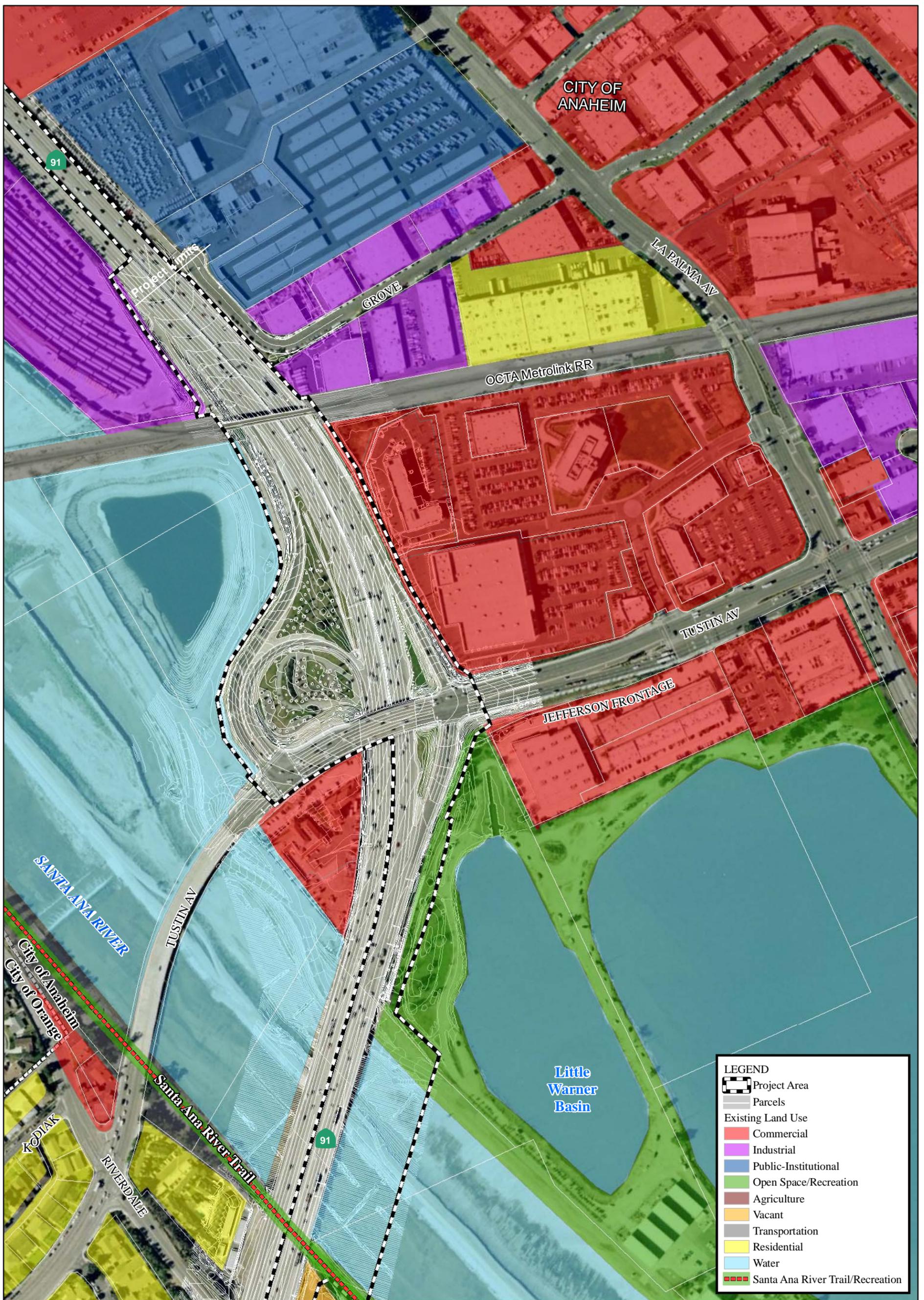


FIGURE 2.1-1

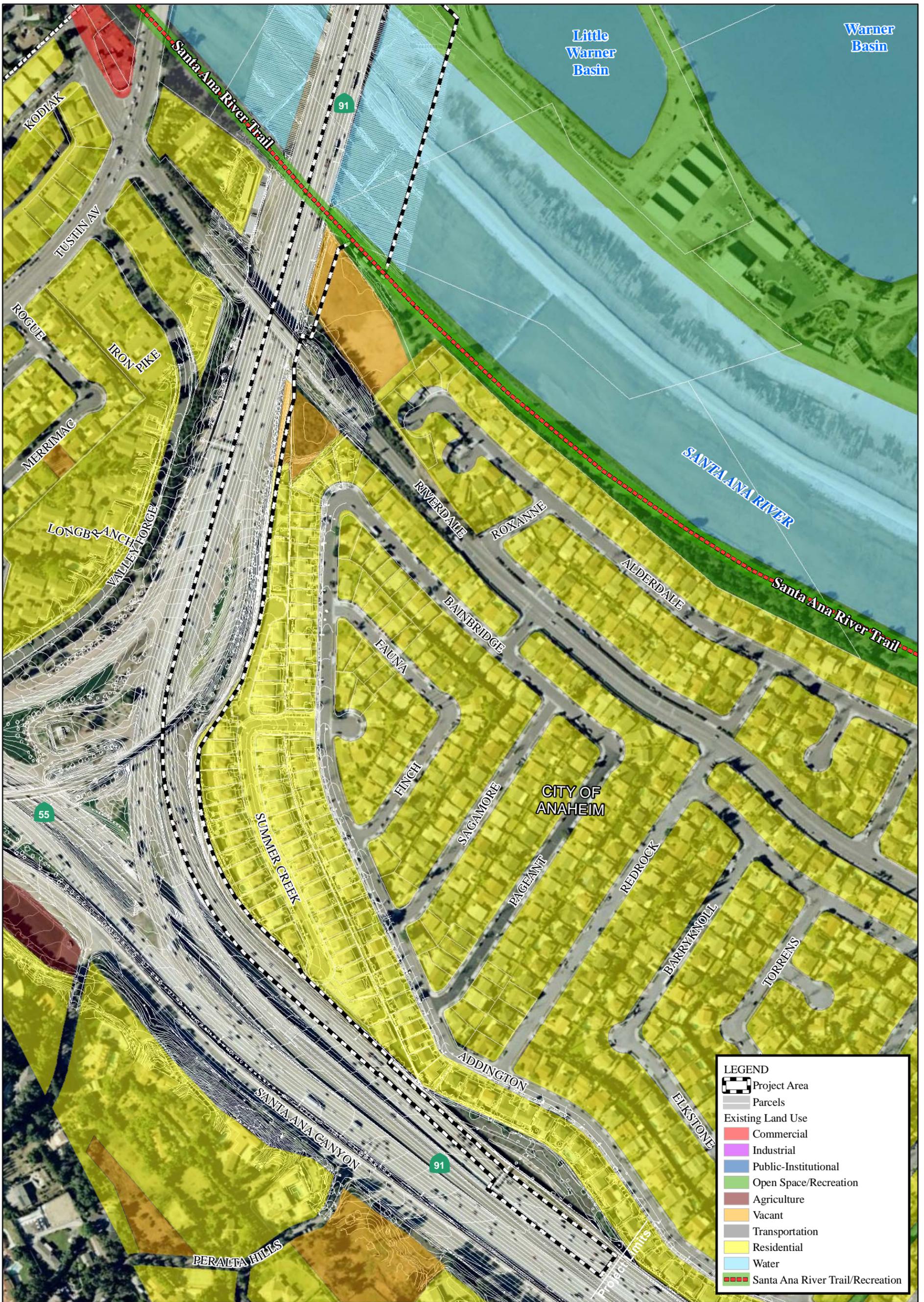
Sheet 1 of 2

Westbound State Route 91 Lane Extension  
 and Auxiliary Lane Reconstruction  
 Existing Land Use Map  
 12-ORA-91 PM 7.9/9.5  
 Project ID No. 120000078 (EA# 0C5600)



SOURCE: Microsoft Virtual Earth (2008); RBF (05/2009); CITY OF ANAHEIM (2010)  
 I:\CDT0806A\GIS\ExistingLandUseMap.mxd (11/4/2010)

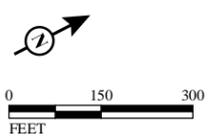
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**LEGEND**

- Project Area
- Parcels
- Existing Land Use
- Commercial
- Industrial
- Public-Institutional
- Open Space/Recreation
- Agriculture
- Vacant
- Transportation
- Residential
- Water
- Santa Ana River Trail/Recreation

FIGURE 2.1-1  
Sheet 2 of 2



SOURCE: Microsoft Virtual Earth (2008); RBF (05/2009); CITY OF ANAHEIM (2010)  
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### **2.1.1.2 Future Land Uses**

Information provided by the City of Anaheim Planning Department,<sup>1</sup> identified the following proposed developments adjacent to the project area. The remaining uses within the project study area reflect established residential and commercial developments. There are no other large parcels within the study area that would be available for new development.

#### ***Kaiser Permanente Hospital Campus***

Construction of the 27-acre (ac) Kaiser Permanente Hospital Campus was initiated during the summer of 2008 and is currently in Phase II of project construction. The new Kaiser facility is located at 3400–3450 La Palma Avenue, within the Canyon Business Center, and will replace the existing Kaiser Foundation Hospital located at 441 Lakeview Avenue. Phase I of the construction which included a four-story, 118,500-square-foot (sf) medical office building has been completed and opened in the summer of 2009. Phase II of the project includes a 180,000 sf medical office building, a six-story, 433,000 sf hospital with 200 beds, a six-story parking structure (681,102 sf), and a 44,694 sf central utility plant. Phase II of the project is currently under construction and is expected to open in 2014. Phase III of the project includes two medical office buildings (100,000 sf and 120,000 sf), a six-story, 200,000 sf extension of the hospital with 160 additional beds, and a six-story parking structure. Phase III is expected to open in 2020, if the need for this phase of the project remains. Total build out of this facility is expected to be approximately 1.2 million sf.

#### ***Pacificenter***

The proposed redevelopment of the Pacificenter complex includes the intensification of existing office and retail developments located at the southwest corner of Tustin Avenue and La Palma Avenue. The proposed project consists of mixed land uses, with an office building, residential units, retail uses, the expansion of the existing Anaheim Metrolink Canyon train station and an associated parking structure. This project is currently in the design phase. The existing Pacificenter Specific Plan is discussed in the following section.

#### ***Anaheim Canyon Metrolink Station***

The improvements planned for the existing Anaheim Canyon Metrolink train station, located in the southwest corner of Tustin Avenue and La Palma Avenue, will include

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<sup>1</sup> City of Anaheim Planning Department, *The Canyon Area Development Update*, July 2009.

an expanded platform, a new plaza area under the existing tracks, and a 600-foot pedestrian connection from the station to the new Kaiser Permanente Hospital Campus. The project is currently in the design phase.

### ***The Crossing***

The Crossing, a transit-oriented development, is a 312-unit residential condominium project with 39 live/work units. The new condominiums will be located at 3520–3570 East La Palma Avenue on a total property of 5.2 ac. This project is currently under construction.

### ***Boeing Site***

Redevelopment of 60 ac of the 100 ac site located at 3370 East Miraloma is being proposed. The proposed development would refurbish the existing offices and industrial buildings and construct new retail stores. This project is currently in the design phase.

### ***Concourse Bowling***

The Concourse Bowling project proposed remodeling of the existing bowling facility located on a 2.7 ac parcel. The remodeling will include an expanded management office, outdoor patio, relocated telecommunications tower, and two freeway-oriented business identification signs. The Anaheim City Council approved this proposed project on March 8, 2008.

## **2.1.2 Consistency with State, Regional, and Local Plans and Programs**

For this analysis, relevant land use, air quality, and circulation/transportation-related goals and policies in the City of Anaheim General Plan (May 25, 2004) and County of Orange General Plan (February 1, 2000) were evaluated for consistency with the proposed project and to understand the development trends, land use-related goals, and specific policies that could affect or be affected by the proposed Build Alternatives.

### **2.1.2.1 General Plans**

#### ***City of Anaheim General Plan (Adopted May 25, 2004)***

##### ***General Plan Land Use Element***

- Goal 3.1** Pursue land uses along major corridors that enhance the City's image and stimulate appropriate development at strategic locations.

**Policy 3** Ensure quality development along corridors through adherence to established development standards and Community Design Element goals, policies, and guidelines.

**Policy 4** Continue to pursue additional open space, recreation, and landscaping amenities along major transportation routes.

#### *Air Quality Element*

**Goal 8.1** Reduce locally generated emissions through improved traffic flows and construction management practices.

**Policy 2** Regulate construction practices, including grading, dust suppression, chemical management, and encourage pre-determined construction routes that minimize dust and particulate matter pollution.

#### *Circulation Element*

**Goal 1.1** Provide a comprehensive multimodal transportation system that facilitates current and long-term circulation of people and goods in and through the City.

**Goal 1.2** Support improvements to highways passing near and through the City.

**Policy 1** Continue working with the Department and the Federal Highway Administration to address traffic flow along State highways that traverse the City.

**Policy 2** Discourage Riverside (SR-91) Freeway bypass traffic through the Hill and Canyon Area by participating in related Major Investment Studies and working with the Department and OCTA to improve traffic flow on SR-91.

**Policy 3** Work with the Department to identify needed improvements to its facilities in the City as necessary.

**Policy 4** Work with the Department and adjacent jurisdictions to improve the operational performance of highways within and adjacent to the City.

**Policy 5** Work with the Department in analyzing the performance of freeway interchanges located in the City and seek appropriate improvements.

**Goal 2.3** Improve regional access for City residents and workers.

**Policy 1** Continue to implement the State-mandated Congestion Management Program and Orange County’s Growth Management Program.

**Policy 2** Actively engage in inter-jurisdictional planning efforts as part of the Measure M program.

**Policy 3** Engage in regionally based planning efforts to improve the jobs-housing balance and regional transit systems.

**Policy 4** Participate in cooperative planning processes to promote effective regional transportation and sustainable development and ensure that citizens of Southern California can access jobs and housing in Anaheim.

### **2.1.2.2 Specific Plans**

The City of Anaheim has adopted the following Specific Plans within the project area.

#### ***Northeast Area Specific Plan***

The Northeast Area Specific Plan covers approximately 2,645 ac in the City of Anaheim and is located in Santa Ana Canyon between Anaheim Hills to the east and downtown Anaheim to the west. The Specific Plan allows for the addition of 7.5 million square feet of building area to the existing inventory of 21.8 million sf for a build out of 29.3 million sf. Development in the Specific Plan area includes a mix of industrial, office, and retail uses.

#### ***Pacificcenter Specific Plan***

The Pacificcenter Specific Plan encompasses 25.71 ac, which are located north of SR-91 and west of Tustin Avenue. The Specific Plan provides for up to 500,000 sf of industrial-related office space, 2,400 sf of industrial-related commercial uses, an 8,000 sf freestanding restaurant, a 4,000 sf fast food restaurant, and a 150-room hotel. Existing businesses include a 116-room Extended Stay America Hotel, a 7,500 sf

general retail building, a 97,600 sf furniture showroom, and two existing drive-through fast food restaurants.

### **2.1.2.3 Transportation Plans**

As discussed in detail earlier in Chapter 1, the proposed project is a major east-west regional transportation corridor serving travelers to areas in Los Angeles, Orange, Riverside, and San Bernardino Counties, including travelers destined to out-of-state locations.

Several regional and subregional transportation plans and programs apply to the City of Anaheim, including the Regional Transportation Plan (RTP), Regional Transportation Improvement Program (RTIP), Regional Improvement Program (RIP), Orange County Congestion Management Program (CMP), and the Air Quality Management Program (AQMP).

#### ***Regional Transportation Plan***

The 2008 RTP (adopted in May 2008) addresses transportation issues for the six-county region in Southern California, which includes Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial Counties. The RTP emphasizes the need for balance between land use and current and future transportation systems. The SCAG is required to develop, maintain, and update the RTP every 3 years. The RTP provides the basic policy and program framework for long-term investment in Southern California's vast regional transportation system in a coordinated, cooperative, and continuous manner. The proposed project is included in the RTP (RTP ID 2M01125) and is described as "ADD 1 AUX LANE WESTBOUND."

#### ***Federal Transportation Improvement Program***

Transportation projects planned within the SCAG region that utilize State or federal transportation funds must be consistent with the RTP and must be included in the FTIP when the proposed project is ready to receive funding. The 2011 FTIP was adopted on September 2, 2010, and lists all transportation projects proposed over a 6-year period within the SCAG region. Projects listed in the FTIP (including highway improvements; transit, rail, and bus facilities; high-occupancy vehicle [HOV] lanes; signal synchronization; intersection improvements; and freeway ramps, etc.) require a large commitment of public funds. The project is included in the 2011 FTIP (Project ID ORA000821) and is described as "SR-91 (SR-55/TUSTIN INTERCHANGE) ADD LANES."

### ***Regional Improvement Program***

As discussed within Chapter 1, as part of the OCTA Freeway Chokepoint Program, freeway improvements were identified to alleviate localized freeway chokepoints. Funds for these projects were allocated from the RIP. The RIP is a State funding category created by Senate Bill (SB) 45 that can be used for a variety of projects, including freeways, carpool lanes, rail lines, transit stations, and road rehabilitation. RIP funds become part of a funding program known as the RTIP.

### ***Orange County Congestion Management Program***

The CMP addresses State requirements for transportation planning and funding in Orange County. Available State funding from increased gas taxes is available only if specific actions outlined in the legislation are employed to reduce levels of congestion on State highways and “principal” arterial highways that are designated by the responsible local agency. The CMP Highway System includes SR-91 within the Cities of Anaheim and Yorba Linda. Cities are encouraged to comply with the required actions to qualify for participation in the CMP program and funding distributions.

### ***Air Quality Management Plan***

The South Coast Air Quality Management District (SCAQMD) and SCAG are responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the South Coast Air Basin (Basin). Every 3 years, the SCAQMD prepares a new AQMP that updates the previous plan and has a 20-year horizon. The SCAQMD adopted the 2003 AQMP in August 2003 and forwarded it to the California Air Resources Board (ARB) for review and approval. ARB approved a modified version of the 2003 AQMP and forwarded it to the United States Environmental Protection Agency (EPA) in October 2003 for review and approval.

The 2003 AQMP updates the attainment demonstration for the federal standards for ozone (O<sub>3</sub>) and particulate matter less than 10 microns in size (PM<sub>10</sub>); replaces the 1997 attainment demonstration for the federal carbon monoxide (CO) standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal nitrogen dioxide (NO<sub>2</sub>) standard that the Basin has met since 1992.

The 2003 AQMP proposes policies and measures to achieve federal and State standards for healthful air quality in the Basin.

This revision to the AQMP also addresses several State and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. This AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the O<sub>3</sub> State Implementation Plan (SIP) for the Basin for the attainment of the federal O<sub>3</sub> air quality standard. However, this revision points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/1999 Plan) to offset increased emission estimates from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the federal Clean Air Act (CAA).

The SCAQMD approved the Final 2007 AQMP (Final 2007 AQMP) on June 1, 2007, as part of a regional and multiagency effort (SCAQMD Governing Board, ARB, SCAG, and the EPA). The Final 2007 AQMP includes developing control strategies, attainment demonstration, reasonable progress, maintenance plans, and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The ARB approved the 2007 AQMP on September 27, 2007, and adopted it as part of the 2007 SIP. The ARB has forwarded the 2007 SIP, which included the 2007 AQMP, to the EPA for its review and approval.

#### **2.1.2.4 Regional Growth Plans**

##### ***Southern California Association of Governments Draft 2008 Regional Comprehensive Plan***

SCAG is responsible for a portion of the regional planning in Southern California. SCAG has been responsible for producing long-range growth and development plans for the Southern California region since the early 1970s. SCAG establishes the framework for the coordination of local and regional decision-making pertaining to future growth and development, and the preparation of growth forecast policies at 3- to 5-year intervals.

Growth forecast policies that are adopted become the basis for SCAG's functional plans (transportation, housing, air, and water) for the region. Population totals and growth distribution information are utilized in planning the future capacity of highways and transit systems, the quantity and location of housing, water supply systems, and the siting and sizing of sewage treatment systems.

### 2.1.3 Parks, Schools, and Recreational Facilities

One school and one recreational facility were identified in the immediate vicinity of the proposed project:

- **Trinity International University (formerly known as Simon Greenleaf University)** – located within the northeast quadrant of the La Palma Avenue and Tustin Avenue intersection (approximately 0.3 mile from the project area)
- **Santa Ana River Lakes** – located south of La Palma Avenue, east of Tustin Avenue, and north of SR-91 (immediately adjacent to the project area)

**Table 2.1.1 Park/Recreational Facilities**

Facility	Size
Santa Ana River Lakes	84.8 ac

Source: City of Anaheim General Plan 2000. City of Orange website:  
[www.cityoforange.gov](http://www.cityoforange.gov)  
ac = acres

Trinity International University functions as a law school and graduate school, enrolling an average of 100 people on an annual basis. The Santa Ana River Lakes are privately operated on Orange County Water District property and offers fishing 7 days a week as well as boat rentals and camping activities.

#### 2.1.3.1 Regional and Local Trails

SR-91 is an existing major highway and does not include a bicycle trail. However, there is an existing recreational trail within the project limits. As listed in the County of Orange General Plan, the Santa Ana River Trail (SART) is located along the south side of the Santa Ana River and crosses under SR-91 within the project limits. The SART begins near the Prado Dam in the City of Corona and continues 30 miles southwest to the Pacific Ocean, eventually joining the Huntington Beach and Newport/Balboa bike trails. The SART is regional Class 1 bikeway and serves recreational and commuter cyclists, walkers, joggers and equestrians on a paved right-of-way completely separated from any street or highway.

## **2.1.4 Environmental Consequences**

### **2.1.4.1 Temporary Impacts**

#### ***No Build Alternative (Alternative 1)***

Under the No Build Alternative, no temporary impacts resulting from construction activities would occur. Therefore, there are no temporary impacts related to land use under the No Build Alternative.

#### ***Build Alternatives 2 and 3***

Under Build Alternatives 2 and 3, some temporary impacts may result from construction activities. Six temporary construction easements (TCEs) would be required for the proposed project. However, these changes in existing uses during project construction would be temporary and would not conflict with established land use plans, affect adjacent uses, or divide an established community.

The SART would be temporarily impacted during the construction phase of the project under both Build Alternatives. The SART would be detoured for up to 4 months during the widening of the SR-91/Santa Ana River Bridge to accommodate the additional improvements. Full use of the SART would be restored following completion of the Santa Ana River Bridge widening. The SART detour plan would be included in the Transportation Management Plan (TMP) for the project (discussed in Section 2.5 of this document). SART access would be maintained during the temporary detour and would provide accommodation to all recreational users. Therefore, temporary impacts to the SART are considered less than significant.

### **2.1.4.2 Permanent Impacts**

#### ***No Build Alternative***

The No Build Alternative would not relieve congestion and improve operational efficiency on the project segment of SR-91 from SR-55 to Tustin Avenue. Therefore, it is not consistent with the City of Anaheim General Plan, RTP, RTIP, and the RIP. In addition, the No Build Alternative would not require a change in existing land use due to parcel acquisitions. Therefore, no land use impacts would occur, and no mitigation measures are required.

#### ***Build Alternatives 2 and 3***

Build Alternative 2 would not require the relocation of any housing or businesses since the proposed project improvements occur mostly within the existing right-of-way. Partial acquisition of one parcel and three permanent easements are required for construction of the proposed improvements.

Build Alternative 3 would not require the relocation of any housing or businesses since the proposed project improvements occur mostly within the existing right-of-way. Partial acquisitions of 16 parcels and three permanent easements are required for construction of the proposed improvements.

The majority of the areas surrounding SR-91 have already been developed for residential and commercial uses. The proposed project would not require complete acquisition of existing adjacent properties and would not result in the need for a change in land use designation or zoning nor would the existing land use pattern be altered. Therefore, no permanent, substantial effects to existing land use would result.

Because the proposed project supports the goals of existing State, regional, and local plans, as discussed above, and is intended to meet the existing and forecasted traffic demand based on adopted land use plans, no impacts would occur.

### **2.1.5 Avoidance, Minimization, and/or Mitigation Measures**

The proposed project is consistent with local, regional and state land use plans. No permanent substantial effects to existing land use would result from implementation of the project; therefore, no avoidance, minimization or mitigation measures are specifically identified for Land Use.

## 2.2 Growth

### 2.2.1 Regulatory Setting

The California Environmental Quality Act (CEQA) requires the analysis of a project's potential to induce growth. CEQA guidelines, Section 15126.2(d), require that environmental documents "...discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment..."

#### 2.2.1.1 First-Cut Screening

The growth-related impacts of the proposed project were assessed using the California Department of Transportation (Caltrans) *Guidance for Preparers of Growth-Related, Indirect Impacts Analyses* (May 2006). The guidance specifically deals with the subset of indirect effects that are referred to as "growth-related impacts" associated with highway projects that encourage or facilitate land use or development that changes the location, rate, type or amount of growth.

The first-cut screening serves to determine whether or not the proposed project would result in changes to accessibility that would ultimately affect land use, growth and development.

Highway projects can affect the location, rate, type, or amount of growth in an area. Some types of development may be directly induced by a project (e.g., a project serving specific types of land development). However, most land use changes in California are not a direct consequence of a highway project, but rather occur indirectly due to changes in accessibility in areas that may be suitable for development. The result may be a change in spatial distribution of development over time, such as commercial development around a new highway interchange. In California, transportation projects are rarely designed to encourage or facilitate growth. Most projects are proposed as a response to traffic congestion that results from growth that has already occurred or will soon occur, rather than attracting new growth to an area that otherwise would not receive it. From this perspective, growth causes the project; the project is not designed to cause growth. Therefore, when California transportation projects have growth-related impacts, they are usually an unintended outcome of the project. However, transportation projects may reduce the time-cost of travel, thereby enhancing the attractiveness of surrounding land to developers and consumers. When the change in accessibility provided by a transportation project facilitates land use change and growth in population and employment, one outcome can be growth-related impacts to environmental resources.

## 2.2.2 Affected Environment

This section describes the demographic characteristics of Orange County (County) and the City of Anaheim (City). The study area for potential growth effects includes the City and the County and, as a result, extends beyond the immediate project limits to include areas in those cities and counties anticipated to be potentially directly and/or indirectly affected and/or benefited by the proposed project. To portray the demographic characteristics of this community impact study area, the 2008 Regional Transportation Plan (RTP) Growth Forecast population estimates adopted by Southern California Association of Governments (SCAG) were evaluated, along with the 1990 United States Census. Table 2.2.1 shows the 1990, 2000, and 2005 populations, the projected 2035 populations, and the projected percent increase in population between 2005 and 2035 for Orange County and the City of Anaheim.

**Table 2.2.1 Population Growth Estimates**

City or County	1990 Population	2000 Population	2005 Population	2035 Population	Projected Growth
Orange County	2,410,556	2,846,289	3,103,337	3,552,742	13%
City of Anaheim	266,406	328,014	341,189	383,739	9%

Sources: United States 1990 Census; SCAG-adopted 2008 RTP Growth Forecast.

SCAG = Southern California Association of Governments

RTP = Regional Transportation Plan

### 2.2.2.1 Historic and Projected Growth Trends

#### **Orange County**

According to the United States Census, the population in Orange County was 2,410,556 persons in 1990, and increased 18 percent to 2,846,289 persons in 2000. According to the SCAG 2008 RTP Growth Forecast, the population in Orange County was 3,103,337 persons in 2005, an increase of nine percent from 2000. By 2007, the population of Orange County was 3,107,500, making it the third largest county in California and the fifth largest county in the nation. Orange County's population grows each year although it has slowed considerably. According to the SCAG 2008 RTP Growth Forecast, between 1990 and 2000, the average annual increase was 1.8 percent, compared to 1.5 percent between 2000 and 2005 and just 0.9 percent between 2006 and 2007. The SCAG 2008 RTP Growth Forecast projects that the population in Orange County will increase by 13 percent, to 3,552,742 persons, by 2035.

## **City of Anaheim**

The City of Anaheim is home to over 330,000 residents, 11,000 businesses, and 1,500 acres (ac) of passive and active parks and open space areas; however, the City is nearing its build-out potential. According to the United States Census, the population of Anaheim increased by 23 percent between 1990 and 2000. Also according to the United States Census, in 2000, the population of Anaheim accounted for 12 percent of Orange County's total population. Anaheim's growth rate was the highest among the 10 largest cities in California and eighth highest among all cities nationally with a population over 300,000. Based on the SCAG 2008 RTP Growth Forecast, the 2005 population in the City of Anaheim was 341,189 persons, a 4 percent increase from 2000. The population increased 1.2 percent by 2008, and is projected to increase just 11 percent between 2008 and 2035, according to SCAG. The City is still growing, but at a slower pace than the County.

### **2.2.2.2 Land Use and Development**

As described in Section 2.1, Land Use, and shown on Figure 2.1-1, the land uses surrounding the project area are completely built out and include residential, recreation, commercial, institutional, water, mixed use, nonresidential mixed use, and industrial. Commercial uses are located on the east and west sides of Tustin Avenue north of State Route 91 (SR-91). Mixed-use areas are located north of SR-91 and east of the Orange County Transportation Authority (OCTA) Metrolink track, while industrial uses are located on both sides of SR-91 on the western end of the study area. Medium-density residential uses comprise most of the south-eastern end of the study area, around the State Route 55 (SR-55)/SR-91 interchange.

There are several highway and roadway improvement projects in the project vicinity that are either in the planning or construction stages. These projects are on existing facilities and are listed in Table 2.2.2.

### **2.2.3 Environmental Consequences**

#### **2.2.3.1 Temporary Impacts**

##### ***No Build Alternative***

Under the No Build Alternative, there would be no improvements within the study area, the existing configuration of the facility would remain, and traffic congestion and operational problems would be anticipated to continue to increase. No project-related temporary growth impacts would occur.

**Table 2.2.2 Improvements within the Project Vicinity**

<b>Project Name</b>	<b>Description</b>
SR-57 Northbound Widening from Orangethorpe Avenue to Lambert Road	Add mixed-flow and auxiliary lanes.
SR-57 Northbound Widening from Katella Avenue On-ramp to Lincoln Avenue Off-ramp.	Add a mixed-flow lane.
SR-91 Eastbound Lane Addition Between SR-241 and SR-71	The 6.9-mile-long project will add one general-purpose lane between SR-241 and SR-71, as well as widening all lanes and shoulders, widening five bridges, constructing retaining walls and sound walls, and adding landscaping.
SR-91 Corridor Improvement Project	Improvements to a 14-mile stretch of SR-91 between SR-241 to Pierce Street (in Riverside, California) and improve I-15 between Cajalco Road and Hidden Valley Road.
SR-91 Improvements from the I-5 to the SR-57	Add capacity in the westbound direction and provide operational improvements at on- and off-ramps to SR-91 between I-5 and SR-57 generally within existing right-of-way.
SR-91 Widening Project Between SR-91/SR-55 Separation and SR-91/SR-241 Separation	Improvements as part of this 6-mile-long widening project include adding one general-purpose lane in the eastbound direction from SR-55 to east of the Weir Canyon Road on-ramp and adding one general-purpose lane in the westbound direction from SR-241 to Imperial Highway.

Sources: Caltrans District 12 Orange County Freeway Projects, <http://www.dot.ca.gov/dist12/ocffreewayprojects.htm>, accessed June 3, 2009; and OCTA Freeways and Streets, <http://www.octa.net/freeway.aspx>, accessed June 3, 2009.

BNSF = Burlington Northern Santa Fe  
 Caltrans = California Department of Transportation  
 I-5 = Interstate 5  
 I-15 = Interstate 15  
 OCTA = Orange County Transportation Authority  
 SR-55 = State Route 55  
 SR-57 = State Route 57  
 SR-71 = State Route 71  
 SR-90 = State Route 90  
 SR-91 = State Route 91  
 SR-241 = State Route 241

### **Build Alternatives 2 and 3**

Alternatives 2 and 3 would not have any temporary impacts on growth-inducing factors since short-term construction activities do not induce growth. Alternatives 2 and 3 would introduce jobs within the project area on a temporary basis during the construction period. These jobs are expected to be filled by existing workers in the Southern California area, and therefore would not require additional housing and would not have a temporary impact on growth.

#### **2.2.3.2 Permanent Impacts**

##### **No Build Alternative**

As stated previously, under the No Build Alternative, no improvements within the study area would be constructed and no project-related permanent growth impacts

would occur (see discussion in section 2.2.3.1 Temporary Impacts, No Build Alternative).

### **Build Alternatives 2 and 3**

Neither Build Alternative 2 nor 3 would open any new areas to development or change the accessibility of the areas surrounding the project site since the project area is located in an urbanized, built-out area.

The pattern of land use development in the vicinity of the proposed project is well established, with no vacant parcels available for development.

The proposed roadway projects within the project vicinity, as shown in Table 2.2.2, are currently in the environmental review process or entitlement process independent from this proposed project. These projects are on existing roadways and no substantial growth inducing effects are expected.

The proposed project would relieve an existing and forecast traffic chokepoint. The project is essentially a reconfiguration and improvement project and neither mixed-flow lanes nor high-occupancy vehicle (HOV) lanes would be added to the mainline as part of this project. As discussed in the Caltrans *Guidance for Preparers of Growth-Related, Indirect Impacts Analyses*, growth-related impacts are not reasonably foreseeable for an auxiliary lane project in a highly urbanized area with low growth rates and little remaining development capacity. Therefore, Alternative 2 or 3 would not influence growth.

The proposed project would accommodate forecast population growth and traffic increases. However, because the project would not substantially increase the capacity of either SR-55, SR-91, or Tustin Avenue, it would not influence the amount, timing, or location of growth in the area. Pressure for growth is typically a result of a combination of factors, including economic, market, and land use demands and conditions. New transportation facilities in areas without those facilities can influence the amount of location of growth in an area in combination with other pressures such as economic and market conditions. The project is located in a well-developed urban area with no vacant land for development. Therefore, Alternative 2 or 3 would not influence growth.

### **2.2.4 Avoidance, Minimization, and/or Mitigation Measures**

Project-related growth is not reasonably foreseeable, and no avoidance, minimization or mitigation measures are required.

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## **2.3 Community Impacts**

### **2.3.1 Community Character and Cohesion**

#### **2.3.1.1 Regulatory Setting**

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.

#### **2.3.1.2 Affected Environment**

The proposed project traverses the central boundary of the City of Anaheim in Orange County, California. This section is based on information from the United States Census Bureau, Census 2000, and the United States Census 2006–2008 American Community Survey 3-Year Estimates. The American Community Survey (ACS) is a new nationwide survey designed to provide communities with a population of 20,000 or more a fresh look at how they are changing. ACS does not provide tract level data; therefore, tract data from the 2000 Census is used in this analysis. Citywide (City of Anaheim) and Countywide data are available from the 2000 Census and the 2006–2008 ACS. The tract data from the 2000 Census will not be updated until the 2010 Census. Therefore, 2000 Census data for the census tracts, City and County, were used in this analysis, with 2008 City and County data provided for context and comparison for certain topics. The study area census tracts for the proposed project are provided on Figure 2.3-1.

As shown in Table 2.3.1, the population of Orange County has increased nearly 5 percent since 2000, while the population of the City of Anaheim has increased approximately 2 percent since 2000. Generally, the other community indicators shown in Table 2.3.1 reflect a similar trend of minimal population increases since 2000, with the exception of the Hispanic population in the City of Anaheim. Based on the review of Census data from the 2006–2008 ACS and observations during a site visit conducted on June 25, 2009, the community character of the study area has not changed substantially since the 2000 Census.

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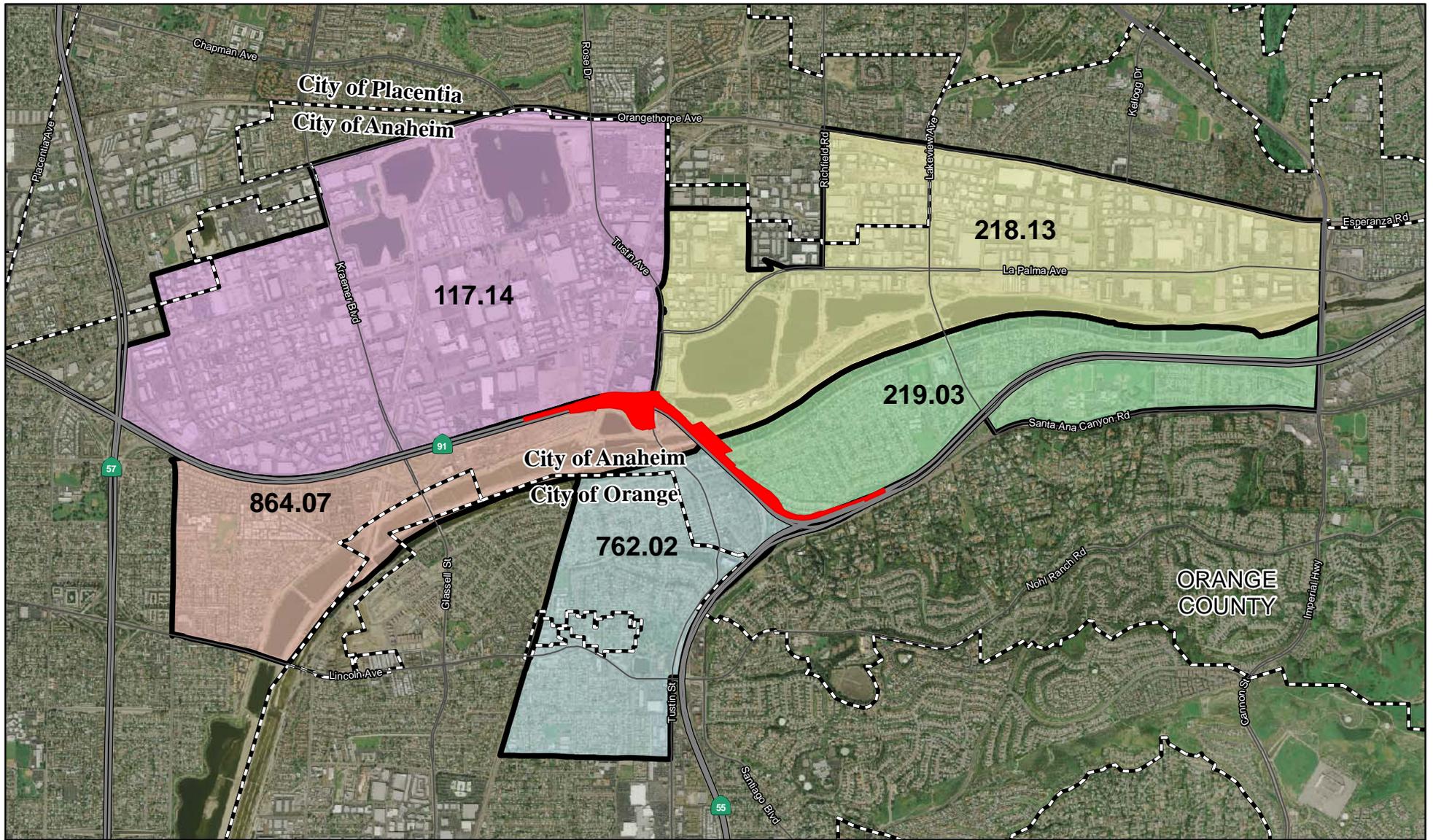
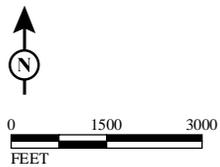


FIGURE 2.3-1

LEGEND

- City Boundary
- Project Study Area
- Census Tracts
- 117.14
- 218.13
- 219.03
- 762.02
- 864.07



SOURCE: RBF (05/2009); U.S. CENSUS BUREAU, 2000; Digital Globe (04/2008)  
 I:\CDT0806A\GIS\CensusTracts.mxd (11/4/2010)

Westbound State Route 91 Lane Extension  
 and Auxiliary Lane Reconstruction  
 Study Area Census Tracts  
 12-ORA-91 PM 7.9/9.5  
 Project ID No. 1200000078 (EA# 0C5600)

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**Table 2.3.1 Community Indicators**

Jurisdiction	Community Indicators							
	White <sup>1</sup>	Non-White <sup>1</sup>	Hispanic <sup>1,2</sup>	Persons per Household	Population > 64	Owner-Occupied Housing Units	Total Population	Housing Units
Counties								
<b>Orange County</b>	64.8% (63.9%) <sup>3</sup>	35.2% (34.5%)	30.8% (3.03%)	3.00 (3.03%)	9.8% (11.1%)	62.4% (62.0%)	2,846,289 (2,985,995)	969,484 (1,029,310)
Affected Communities								
<b>City of Anaheim</b>	54.8% (64.0%)	45.2% (33.5%)	46.8% (52.4%)	3.34 (3.42%)	8.2% (9.2%)	51.5% (50.3%)	328,014 (334,795)	99,719 (102,553)
Study Area Census Tracts								
<b>Tract 117.14</b>	41.4%	47.7%	75.2%	3.87	6%	14.1%	302	82
<b>Tract 218.13</b>	53.5%	35.0%	67.4%	3.23	14%	46.2%	43	14
<b>Tract 219.03</b>	69.1%	26.7%	24.5%	3.39	8%	86.7%	3,965	1,176
<b>Tract 762.02</b>	71.8%	23.2%	29.2%	2.93	9%	59.9%	5,689	1,977
<b>Tract 864.07</b>	48.3%	46.7%	73.7%	4.20	6%	60.2%	6,217	1,498

Source: United States Census Bureau, Census 2000.

<sup>1</sup> Percentages do not add up to 100% because individuals may identify with, and report, more than one category.

<sup>2</sup> The Census Bureau recognizes Hispanic heritage as an ethnic group rather than a separate race. If the Hispanic percentage is added to other groups, the total may exceed 100%.

<sup>3</sup> United States Census, 2006–2008 American Community Survey.

Community cohesion, as defined by the California Department of Transportation (Caltrans) Environmental Handbook Volume 4, is the degree to which residents have a sense of belonging to their neighborhood, their level of commitment to the community, or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Cohesion refers to the degree of interaction among the individuals, groups, and institutions that make up a community. Cohesive communities are associated with specific social characteristics that 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 homeownership, 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. The character and cohesion of this community is also defined by the land uses, services, facilities, and other features within the study area. As shown in Figure 1-1 of Chapter 1, the project area is within the City of Anaheim.

Indicators that a community has a high degree of cohesion include long-term residents, households of two or more people, high rates of homeownership, ethnic homogeneity, and a high percentage of elderly residents. These indicators were

identified in the Census 2000 summary files for the County of Orange (County), City of Anaheim (City), and census tracts within the project area (see Table 2.3.1).

An average of 53.4 percent of housing units within the study area census tracts are owner occupied, which is lower than the County at 62.4 percent but slightly higher than the City at 51.5 percent. Tracts 117.14 and 218.13 have substantially lower percentages of owner-occupied units at 14.1 percent and 46.2 percent, respectively, compared with the other tracts, the City, and the County. These tracts are located within an area of the City that is mostly commercial and industrial with few residences, and the combined total population of these tracts is approximately 350 persons.

The average number of persons per household located in the study area census tracts are reported at approximately 3.5 persons per household. This average is higher than both the City and County. Tracts 864.07 and 117.14 have the highest number of persons per household, at 4.20 and 3.87, respectively.

The County is characterized by an approximately 65 percent White population, and the City by an approximately 55 percent White population. Tracts 762.02 and 219.03 have the highest percentage of white residents, 71.8 and 69.1 percent, respectively, which is substantially higher than the City or County. The City has substantially more Hispanic residents (46.8 percent) than the County (31 percent). Tracts 117.14, 864.07, and 218.13 have the highest percentage of Hispanic residents, approximately 25 percent higher than the City and approximately 41 percent higher than the County.

The population of the City of Anaheim has a fairly high degree of ethnic homogeneity, with Whites and Hispanics comprising the majority of the population. The study area census tracts follow a similar pattern as the City, with all the tracts reporting higher percentages of White population compared to the City, with the exception of Tracts 117.14 and 218.13 where Hispanic populations are greater than the City, at 75.2 percent and 67.4 percent, respectively.

The City of Anaheim has a similar percentage of residents over age 64 as the County (8.2 percent and 9.8 percent, respectively). Two of the census tracts in the study area have substantial populations over age 64 (Tract 218.13 has 14 percent, and Tract 762.02 has 9 percent), while two report 6 percent of the population over age 64 (Tracts 117.14 and 864.07).

Based on the indicators of community cohesion, there is an average degree of community cohesion within the study area. The average number of persons per household in the study area census tracts are slightly higher than the City of Anaheim and County of Orange averages, with the exception of Census Tract 762.02, and the populations are ethnically homogeneous with the populations comprised of either White or Hispanic residents. There is a high percentage of owner-occupied housing units in all tracts compared to the City percentage, except Tract 117.14. Tract 218.13 has a substantially higher proportion of the population over age 64 (14 percent) compared to the other tracts and the reference populations. In addition, some of the data are skewed due to the limited population and number of housing units, particularly in Tracts 117.14 and 218.13.

Additionally, the study area census tracts are separated by State Route 91 (SR-91) and Tustin Avenue, which would limit accessibility and interaction between census tracts.

In summary and based on the study area's demographic characteristics, it is expected that there is an average degree of community cohesion within the five study area census tracts, which diminish at the regional and city levels.

### ***Community Facilities and Services***

Community facilities and services (i.e., schools, libraries, and community centers) are discussed in this section as they pertain to community character and cohesion. There is an existing recreational trail within the project limits. The Santa Ana River Trail is located along the south side of the Santa Ana River and crosses under SR-91 within the project limits.

The project site is within the service boundaries of the Orange Unified School District. There are no adult education centers or public or private elementary, intermediate or high schools within approximately 0.5 mile (mi) of the study area.

There are no parks located within 0.5 mi of the project or the study area.

There are no public libraries, community centers, police departments, fire stations or post offices located within 0.5 mi of the project site. Section 2.4, Utilities and Emergency Services, describes police and fire stations that are located 1 mi or greater from the project site.

### **2.3.1.3 Environmental Consequences**

#### ***Temporary Impacts***

##### *No Build Alternative*

The No Build Alternative does not propose construction of any improvements and therefore would not result in any temporary impacts to community character and cohesion.

##### *Build Alternatives 2 and 3*

Construction activities associated with Alternative 2 would result in temporary impacts to community character and cohesion. Construction staging, road detours, access restrictions, and temporary ramp closures would impact local businesses and residents living in the communities surround the project area, most directly in Tracts 219.03 and 762.02, where residences are adjacent to the project area. Residential areas in other tracts are located farther from the freeway and would be less affected by construction staging, road detours, access restrictions, and/or ramp/freeway closures.

Temporary reductions or closures may occur when barriers are being moved into position, when lanes are being restriped, when falsework is being installed or removed, or when the freeway is being restored to its completed condition. These closures would occur during nonpeak hours, and adequate notification would be provided to the public and appropriate service purveyors.

Local businesses may be impacted due to construction staging and activities. The existing pedestrian crosswalk at the westbound Tustin Avenue off-ramp will be temporarily detoured during construction of the ramp realignment.

The project area does not have a substantially high degree of community cohesion. The implementation of a TMP would minimize temporary construction impacts that have the potential to affect the local community; therefore, temporary impacts to community character and cohesion would be considered less than significant.

#### ***Permanent Impacts***

##### *No Build Alternative*

As stated previously, the No Build Alternative does not propose construction of any improvements; therefore, it would not result in any permanent impacts to community character and cohesion.

### **Build Alternatives 2 and 3**

Alternative 2 and Alternative 3 would not physically divide an established community, as the communities in the immediate project vicinity are already separated by the existing SR-55/SR-91 junction and the existing SR-91/Tustin Avenue interchange facilities. As discussed previously in Section 2.2, Growth, the project site is located within a developed, urbanized area. Alternative 2 and Alternative 3 would not open any new areas to development or change the accessibility of the areas surrounding the project site because all proposed improvements are on the existing freeway. Both Alternatives 2 and 3 would provide long-term benefits to the local community by relieving congestion and improving access and circulation by correcting operational deficiencies of the SR-55 through SR-91 westbound Tustin Avenue connector. Therefore, the construction and operation of either Alternative 2 or Alternative 3 would not permanently affect the character or cohesion of the study area census tracts, the City of Anaheim, or the County of Orange.

#### **2.3.1.4 Avoidance, Minimization, and/or Mitigation Measures**

Implementation of Alternatives 2 and 3 would not result in permanent, adverse impacts to community character and cohesion. Temporary construction-related impacts will be minimized with implementation of the TMP, which is described in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities.

### **2.3.2 Relocations**

#### **2.3.2.1 Regulatory Setting**

The Department's Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons 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 U.S.C. 2000d, et seq.). Please see Appendix C for a copy of the Department's Title VI Policy Statement.

### 2.3.2.2 Affected Environment

The affected environment in the project area was described earlier in Section 2.3.1, Community Character and Cohesion. The proposed project would not result in any displacements or relocations; therefore, a relocation impact report was not prepared.

### 2.3.2.3 Environmental Consequences

#### **Temporary Impacts**

##### *No Build Alternative*

The No Build Alternative would not result in the acquisition of any property and, therefore, would not result in temporary relocation impacts.

##### *Build Alternatives 2 and 3*

Temporary construction activities would occur under Alternatives 2 and 3 that affect property owners whose properties are impacted by the proposed project. However, no temporary relocations would be required, and no relocation impacts to property owners would occur. Alternative 2 and Alternative 3 would require 4 TCEs and 3 PCEs, as shown in Table 2.3.2.

**Table 2.3.2 TCEs under Alternatives 2 and 3**

APN	Area Needed for TCE for Alternative 2 (sf)	Area Needed for TCE for Alternative 3 (sf)
346-121-01	14,960.19	20,458.30
346-121-02	53,324.23	53,349.53
346-121-03	7,986.66	9,245.37
360-184-01	11,042.67	11,042.48
<b>Total</b>	<b>87,313.75</b>	<b>94,095.68</b>

Source:  
APN = Assessor's Parcel Number  
sf = square feet  
TCEs = temporary construction easements

Temporary construction impacts would occur to property owners whose properties are affected by TCEs. These property owners would be temporarily impacted during the construction process by construction staging, including storage and movement of construction supplies and equipment.

#### **Permanent Impacts**

##### *No Build Alternative*

As stated previously, the No Build Alternative would not result in the acquisition of any property; therefore, it would not result in permanent relocation impacts.

### Build Alternatives 2 and 3

Alternative 2 would require one partial property acquisition and three permanent easements as shown in Table 2.3.3. The partial acquisition and permanent easements occur in various locations of the project, including along the Santa Ana River. No displacements or relocations of residences or businesses are required under Alternative 2.

**Table 2.3.3 Properties Impacted By Partial Acquisitions and Permanent Easements Under Alternatives 2 and 3**

APN	Area Needed (sf) Partial Acquisitions	Permanent Easements	Existing Use	General Plan Land Use
<b>Alternative 2</b>				
346-121-01	3,078.35	3,080.46	Open Space <sup>1</sup>	Parks/Water/Open Space
346-121-02		20,433.08	SAR Bridge	Transportation
346-121-03		1,472.41	SAR Bridge	Transportation
<b>Alternative 3</b>				
346-121-01	9,667.65	9,407.28	Open Space <sup>1</sup>	Parks/Water/Open Space
346-121-02		28,951.00	SAR Bridge	Transportation
346-121-03		2,292.99	SAR Bridge	Transportation
359-211-26	1,169.42		SFR	Low Density Residential
359-211-27	429.09		SFR	Low Density Residential
359-211-28	453.35		SFR	Low Density Residential
359-211-29	508.26		SFR	Low Density Residential
359-211-30	472.52		SFR	Low Density Residential
359-211-31	510.95		SFR	Low Density Residential
359-211-32	404.23		SFR	Low Density Residential
359-211-33	371.79		SFR	Low Density Residential
359-211-34	344.20		SFR	Low Density Residential
359-211-35	421.59		SFR	Low Density Residential
359-211-36	492.30		SFR	Low Density Residential
359-211-37	655.20		SFR	Low Density Residential
359-211-38	452.48		SFR	Low Density Residential
359-211-39	449.78		SFR	Low Density Residential
359-211-40	390.46		SFR	Low Density Residential

Source: Final Project Report, LAN Engineering, February 2009, City of Anaheim Geographic Information System, <http://gis.anaheim.net/ParcelInfo/Default.aspx> (accessed September 10, 2009).

<sup>1</sup> Orange County Water District  
APN = Assessor's Parcel Number  
sf = square feet  
SAR = Santa Ana River  
SFR = single-family residential

Alternative 3 would require 16 partial acquisitions and 3 permanent easements, as shown in Table 2.3.3. No relocations or displacements of residences or businesses are required under Alternative 3.

#### **2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures**

All acquisitions will be in compliance with the Caltrans Right-of-Way Manual, which requires compensation at fair market value for temporary use (TCEs), permanent easements, and permanent property acquisitions. The project will conform to the guidelines and requirements of the Caltrans Relocation Assistance Program and the Uniform Relocation Assistance and Real Property Acquisitions Policies Act (Uniform Act) of 1970 (Public Law 91-646, 84 stat. 1894). The TMP, identified in Section 2.5, will include coordination with property owners regarding the construction schedule and phasing.

### **2.3.3 Environmental Justice**

#### **2.3.3.1 Regulatory Setting**

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2009, this was \$22,050 for a family of four. All consideration under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The California Department of Transportation's (Department's) commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix B of this document.

#### **2.3.3.2 Affected Environment**

This section is based on information from the United States Census Bureau, Census 2000, and the United States Department of Health and Human Services 2009 Poverty Guidelines.

The environmental justice analysis was conducted using census tract information from the 2000 United States Census since this is the most current demographic information available at the census tract level.

The following analysis provides a comparison of the measures with which to evaluate environmental justice:

- Percentage of Non-White residents in the study area census tracts

- Percentage of Hispanic residents (the Census Bureau considers Hispanic or Latino ethnicity distinct from racial background) in the study area census tracts
- Percentage of population below poverty level in the study area census tracts
- Median household income in the study area census tracts

As shown in Table 2.3.4, Non-White residents make up over 45 percent of the population of Tracts 117.14 and 864.07, and approximately 27 percent of the population of Tract 219.03. Hispanic residents make up approximately 75 percent of the population of Tracts 117.14 and 864.07, and 67 percent of Tract 218.13. Tracts 219.03 and 762.02 have the lowest number of Non-White and Hispanic residents. In addition to having the highest proportion of Non-White and Hispanic residents, Tracts 117.14 and 864.07 have the lowest median household income and greatest percentage of persons below poverty. Tracts 219.03 and 762.02, with the lowest proportion of Non-White and Hispanic residents, also have the highest median household income and the lowest number of persons below poverty.

**Table 2.3.4 Environmental Justice Populations**

<b>Census Tract</b>	<b>Non-White Residents</b>	<b>Hispanic Residents<sup>1</sup></b>	<b>Percent Below Poverty Level</b>	<b>Median Household Income</b>	<b>Percent Transit-Dependent Persons</b>
County of Orange	35.2%	30.8%	7%	\$58,820	36.9%
City of Anaheim	45.2%	46.8%	10%	\$47,122	38.4%
Tract 117.14	47.7%	75.2%	45.8%	\$35,893	43%
Tract 218.13	35.0%	67.4%	7.9%	\$52,500	47%
Tract 219.03	26.7%	24.5%	3.2%	\$75,923	37%
Tract 762.02	23.2%	29.2%	7.9%	\$55,303	39%
Tract 864.07	46.7%	73.7%	8.7%	\$49,583	41%

Source: United States Census Bureau, Census 2000.

<sup>1</sup> The Census Bureau recognizes Hispanic heritage as an ethnic group rather than as a separate race. If the Hispanic percentage is added to other groups, the total may exceed 100%.

Compared to the County and City, the study area census tracts, on average, have a median household income that is comparable to the average of the City and the County. All the study area census tracts, except one (Tract 117.14), report fewer persons below poverty than either the County or the City.

Transit-dependent persons are those under 18 or over 65 years of age. As shown in Table 2.3.4, most of the percentages of transit-dependent persons residing in the study area census tracts are comparable to those of the County and City. Tracts 117.14 and

218.13 have slightly higher percentages of transit-dependent persons compared to the City and County. However, these tracts are skewed due to their populations, which total less than 350 persons.

### **2.3.3.3 Environmental Consequences**

#### ***Temporary Impacts***

##### *No Build Alternative*

The No Build Alternative would not result in property acquisition, community disruption, or other changes that could adversely affect populations. The No Build Alternative would not result in adverse temporary environmental justice impacts.

##### *Build Alternatives 2 and 3*

The proposed improvements would occur along the existing freeway. Temporary construction impacts (e.g. detouring public services, construction noise, visual changes, detouring accessibility to retail services), would occur under Alternatives 2 and 3. However, these impacts would not have a substantial, disproportionate impact on environmental justice populations.

#### ***Permanent Impacts***

##### *No Build Alternative*

The No Build Alternative would not result in property acquisition, community disruption, or other changes that could adversely affect minority and low-income populations. The No Build Alternative would not result in adverse permanent environmental justice impacts.

##### *Build Alternatives 2 and 3*

The factors related to environmental justice, discussed above in Section 2.3.3.2, indicate that the project would not cause disproportionately high and adverse effects on any minority or low-income populations as per EO 12898 regarding environmental justice. Therefore, no avoidance, minimization, or mitigation measures are required.

## **2.4 Utilities and Emergency Services**

### **2.4.1 Affected Environment**

This section is based on a review of existing utility and service providers and facilities in and immediately adjacent to the project disturbance limits.

#### **2.4.1.1 Utilities**

Water and electrical service in the City of Anaheim (City) is provided by Anaheim Public Utilities, which is owned and operated by the City. The City maintains the sewer lines and select water lines, while the Orange County Water District (OCWD), UTI for Orange County Water District (UTI), and Metropolitan Water District of Southern California (MWD) own and maintain the remaining water lines in the project area. The City has its own fiber optics network that provides services to the project area.

The Orange County Sanitation District (OCSD) collects and treats sewer discharges in the City. The Southern California Gas Company (SoCalGas) provides natural gas and the Southern California Edison (SCE) provides underground and above-ground electrical service. Cable and telephone services in the project area are provided by Time Warner Cable, AT&T, Pacific Bell, and Verizon.

The Metrolink railroad, which is operated by the Southern California Regional Rail Authority, traverses the project limits in a general north-south direction, underneath the existing State Route 91 (SR-91) freeway, west of the Tustin Avenue interchange. The Anaheim Canyon Metrolink train station is located approximately 800 feet (ft) northwest of the project site.

Several SCE overhead electrical lines traverse the project site. The locations of these overhead power lines are discussed in detail in Section 2.4.2.

#### **2.4.1.2 Emergency Services**

Fire services in the City are provided by the Anaheim Fire Department. The closest station to the project site is Fire Station 8, located at 4555 East Riverdale Avenue, approximately 0.44 mile northeast of the project area. Fire Station 8 houses Battalion 1, which provides paramedic services, fire suppression, rescue, and hazardous materials response capabilities. Fire Station 8 responds to both the SR-91 and State Route 55 (SR-55) freeways, and has the potential to respond to river rescues in the Santa Ana River, which is located behind the station.

The City is also part of a regional coordination system with other firefighting agencies in which fire units are dispatched through the Metro Cities Fire Authority. The Metro Cities Fire Authority Communications Center serves seven cities: Anaheim, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Newport Beach, and Orange.

Law enforcement services in the City of Anaheim are provided by the Anaheim Police Department. The closest police facility to the project site is the East Station, which is located at 8201 East Santa Ana Canyon Road. Law enforcement services for the unincorporated areas of Orange County near the project site are provided by the Orange County Sheriff's North Patrol.

Law enforcement on SR-91 is provided by the Border Division of the California Highway Patrol (CHP). The closest CHP station to the project site is located in Santa Ana at 2031 East Santa Clara Avenue.

There are no hospitals adjacent to the project area. The nearest hospital to the project area is the Kaiser Foundation Hospital of Anaheim located at 441 North Lakeview Avenue, which is northeast of the project area. However, the Kaiser Foundation Hospital will be relocated to a new 27-acre Kaiser Permanente Hospital Campus located at 3400–3450 La Palma Avenue (north of SR-91 and west of the Anaheim Canyon Metrolink train station, approximately 0.24 mile from the project site) by the year 2014. The following hospitals are located within 10 miles of the project area:

- Placentia Linda Hospital – 1301 North Rose Drive, Placentia
- Universal Hospital – 1440 South College Boulevard, Anaheim, CA
- St. Joseph Hospital – 100 West Stewart Drive, Orange
- Western Medical Center Hospital – 1025 South Anaheim Boulevard, Anaheim

## **2.4.2 Environmental Consequences**

### **2.4.2.1 Temporary Impacts**

#### ***No Build Alternative***

There would be no construction activities for improvements associated with the proposed project under the No Build Alternative, and no temporary impact to utilities and emergency services would occur.

#### ***Build Alternatives***

There is a potential to impact the utilities located in the project area under Build Alternatives 2 and 3. Potential impacts to utilities resulting in temporary service

disruptions and/or utility relocations as a result of the proposed project are summarized in Table 2.4.1.

**Table 2.4.1 Utility Impacts within the Project Limits**

<b>Utility Provider</b>	<b>Type of Utility</b>	<b>Location</b>
City of Anaheim	Underground Electrical Line	The 60-foot (ft) long underground electrical line located north of State Route 91 (SR-91) traverses the project limits in a northeast-southwest direction.
City of Anaheim	Overhead electrical line	The 12.5 kilovolt (kV) line traverses the project limits in a northeast-southwest direction. The line is parallel to and 25 ft north of SR-91.
City of Anaheim	Overhead electrical line	The 12 kV line traverses the project limits in a northeast-southwest direction. The line is parallel to the SR-91 and located approximately 25 ft east of the Metrolink railroad tracks.
City of Anaheim	Overhead electrical line	The 12 kV line traverses the project limits in a north-south direction. The line begins 25 ft north of and ends at 55 ft south of SR-91.
City of Anaheim	Potable water line	The 36-inch water line begins 300 ft north of and 50 ft west of SR-91. The water line then continues 200 ft south, 300 ft southeast for 160 ft before continuing for another 200 ft south, then 800 ft southeast parallel to the centerline of SR-91. The water line then continues 360 ft southwest across SR-91 and then 400 ft southeast of and parallel to SR-91.
City of Anaheim	Overhead electrical line	The overhead electrical line begins 365 ft north of centerline of Riverdale Avenue and 550 ft east of centerline of SR-91. The electrical line then continues southwest for 770 ft, then travels southeast for 100 ft.
City of Anaheim	Sewer Line	The 15-inch sewer line begins 400 ft north of the centerline of Riverdale Avenue and 400 ft east of the centerline of SR-91. The sewer line then continues southwest for 575 ft and beyond the project boundary.
City of Anaheim	Water Line	The 24-inch water line starts beyond the project limits and begins within the project limits 350 ft north of the centerline of Riverdale Avenue and 550 ft east of the centerline of SR-91. The water line then continues another 1,725 ft southwest across SR-91 and beyond the project limits.
City of Anaheim	Underground 12 kV electrical line	The underground 12 kV electrical line begins 365 ft north of the centerline of Riverdale Avenue and 450 ft east of the centerline of SR-91.
City of Anaheim	Potable Water Line	The 14-inch water line starts within the project limits, 600 ft of the centerline of SR-91 and 150 ft west of the joining of East Addington Drive and East Bainbridge Avenue. The water line continues southwest for approximately 900 ft and then beyond the project limits.
Metropolitan Water District	Potable Water Line	The 79-inch welded steel water line begins within the project limits, 500 ft north of the centerline of SR-91, 150 ft west of the joining of East Addington Drive and East Bainbridge Avenue, and continues southwest 900 ft and beyond the project limits.
Orange County Sanitation District	Sewer lines	The 78-inch sewer line is located along the northern side of Grove Street, perpendicular to SR-91. The sewer line continues southward beyond SR-91. The average depth of these sewer lines is estimated at 20 ft below ground surface.
Orange County Water District	Water pipeline	The 66-inch water pipeline starts 180 ft north and 25 ft west of SR-91 and continues 150 ft west, curving northwest for approximately 80 ft, and then continues north for at least 100 ft, past the project limits.
Orange County Water District	Potable water outlet pipes (pumped from Warner Basin)	The 30-inch outlet pipe starts at the northeast portion of the Warner Bypass Pipeline Structure, located approximately 400 ft north of SR-91. The water outlet continues northeast for approximately 250 ft and beyond the project limits.
Orange County Water District	Potable water outlet pipes (pumped from Warner Basin)	The 30-inch outlet pipe starts at the northeast portion of the Warner Bypass Pipeline Structure, located approximately 400 ft north of SR-91. The water outlet continues northeast for approximately 250 ft and beyond the project limits.
Orange County Water District	Potable Water Line	The 36-inch water line starts at the northeast portion of the Warner Bypass Pipeline Structure, located approximately 400 ft north of SR-91. The water pipeline then continues northeast for at least 250 ft and beyond the project limits.

**Table 2.4.1 Utility Impacts within the Project Limits**

Utility Provider	Type of Utility	Location
Pacific Bell	Underground telecommunications cable	The telecommunication cable starts at the end edge of Tustin Avenue, 225 ft south of SR-91, and continues 25 ft west, curves northeast for approximately 225 ft and then straightens out and continues 400 ft, crossing SR-91, before ending northeast of the northeast corner of the Tustin Avenue and SR-91 overpass.
Pacific Bell	Underground telecommunications conduit	The underground telecommunications conduit starts 75 ft of East Tustin Avenue, 225 ft south of SR-91. The conduit then continues northeast for 75 ft, then southeast for 100 ft, 170 ft northeast, and ending 25 ft south of the northern edge of SR-91.
Southern California Edison	Overhead electrical lines	Starts at Metal Electrical Tower 340/1c 1929 and continues northeast approximately 925 ft to Metal Electrical Tower 339/1c 1929. The overhead electrical line continues northeast beyond the project boundaries for at least 300 ft.
Southern California Edison	Overhead electrical lines	The three separate overhead electrical lines traverse the project site from the northeast to the southeast, parallel to the Metrolink railroad tracks.
Southern California Edison	Overhead electrical line	The overhead electrical line begins 375 ft north of the centerline of Riverside Avenue and 550 ft east of centerline of SR-91, and then travels southwest for 650 ft.
Southern California Edison	Overhead electrical line	The overhead electrical line begins 365 ft north of the centerline of Riverside Avenue and 550 ft east of centerline of SR-91, and then travels southwest for 770 ft, and then southeast for 100 ft.
Southern California Edison	Overhead electrical line	The overhead electrical line begins 175 ft north of and 25 ft west of SR-91, then continues south for 75 ft, then southeast, parallel to the SR-91 for 950 ft. The electrical line then crosses the freeway and travels southwest for 300 ft, then southeast for 200 ft.
Southern California Gas Company	Gas line	The 36-inch gas line (with a 42-inch casing) traverses the project limits in a northeast to southwest direction, approximately 40 ft west of the Metrolink railroad tracks until the SR-91. The pipeline continues north of the SR-91, perpendicular to the highway and south of Grove Street.
Time Warner Cable	Fiber optic overhead cable	The overhead fiber optic cable is parallel to SR-91.
Time Warner Cable	Overhead cable	The overhead telecommunications cable is parallel to SR-91.
Time Warner Cable	Overhead cable	The overhead telecommunications cable is parallel to SR-91.
Unknown	Underground electrical line	The underground electric line is parallel to and at the east edge of Tustin Avenue North, for approximately 800 ft. The underground electric line then travels east for 75 ft and then southeast for 25 ft.
Unknown	Underground electrical line	The underground electric line is begins 175 ft south of SR-91, then continues west across Tustin Avenue for 100 ft, then along the west edge of Tustin Avenue for 130 ft.
Unknown	Potable Water Line	The 12-inch water line starts within the project limits, 600 ft north of centerline of SR-91 and 150 west of the joining of East Addington Drive and East Bainbridge Avenue and continues 900 ft southwest and beyond the project limits.
Unknown	Fiber optic cable	The overhead fiber optic cable begins 175 ft north of the centerline of the westbound State Route 55 (SR-55) and 550 ft east of the centerline of SR-91 eastbound to the SR-55 south on-ramp. The fiber optic cable continues parallel to SR-91 west-northwest for 825 ft, then northeast for 140 ft, where it splits into two lines. One line goes southwest for 100 ft to the centerline of SR-91, and the other line continues northwest, parallel to SR-91 for 1,400 ft, then continues 125 ft west, 125 ft northwest, 75 ft west, and finally 200 ft northwest.
Verizon	Fiber optic overhead cable	The overhead fiber optic cable is parallel to SR-91.
Verizon	Fiber optic overhead cable	The overhead fiber optic cable begins on the east curb of Peralta Hills Drive East, 90 ft southeast of the intersection of Peralta Hills Drive East and Santa Ana Canyon Road, and then curves northwest then northeast for about 50 ft.

Source: RBF Engineering, October 2009

The Metrolink railroad tracks would not be affected by the Build Alternatives.

To minimize temporary impacts related to the disruption of utility services, overhead and underground utilities disturbed by Build Alternatives 2 and 3 and not planned for relocation will be protected in place. The remaining utilities will be relocated within the proposed right-of-way as necessary. Utility relocations that occur as a result of the Build Alternatives would be implemented such that utility service interruptions would be minimized. In addition, the appropriate service purveyors would be notified of all facilities planned for relocation prior to construction. Measure U-2 would ensure that disruption of services and impacts to the facilities are minimized or avoided during construction.

There is the potential for implementation of the Build Alternatives to temporarily increase the response times for emergency services vehicles along westbound (WB) SR-91 during construction. No street closures are anticipated; however, there would be short-term ramp and lane closures. No ramp closures would exceed 10 consecutive days. Overnight closures would occur during nonpeak traffic hours. The temporary closures anticipated during the construction of the proposed project are listed below in Table 2.4.2.

**Table 2.4.2 Temporary Closures**

Location of Temporary Closure	Period of Temporary Closure	Purpose of Temporary Closure
Tustin Ave WB off-ramp	One or two weekend closures	Construct concrete termini and match existing grade
Tustin Ave WB on-ramp	overnight closures	Install K-rail and restripe roadway
NB SR-55 to WB SR-91	overnight closures	Install K-rail, restripe, and construct gore
WB SR-91 mainline	overnight lane closures	Install K-rail and restripe roadway

Source: RBF Engineering, November 2009  
WB = westbound

Alternative routes would be available for use by emergency services vehicles during temporary ramp and lane closures, as applicable. Short-term delays for emergency response vehicles would be minimized with implementation of a Transportation Management Plan (TMP) (refer to Section 2.5, Traffic and Transportation).

#### **2.4.2.2 Permanent Impacts**

##### ***No Build Alternative***

The No Build Alternative would not result in disturbance or relocation of utilities, and no permanent impact to utilities would occur.

The No Build Alternative would not reduce traffic congestion on the project section of SR-91; therefore, there would be no corresponding improvement in emergency response times on the SR-91.

### **Build Alternatives**

The existing power poles adjacent to the WB Tustin Avenue off-ramp would be permanently relocated during construction.

The Build Alternatives would improve the level of service and reduce traffic delays on the project section of SR-91 (refer to Section 2.5, Traffic and Transportation). By improving congestion and delays within the project area, the Build Alternatives may improve response times for emergency services vehicles that utilize the freeway.

### **2.4.3 Avoidance and/or Minimization Measures**

**U-1 Emergency Services.** The Anaheim Fire Department, the Anaheim Police Department, and the California Highway Patrol require prior notice of the commencement of construction activities and that a minimum of one lane on westbound State Route 91 (SR-91) be maintained during construction.

**U-2** Prior to commencement of construction, the Project Engineer will coordinate with all affected utility purveyors to establish exact procedures and specifications for all facilities to be relocated during construction to the satisfaction of the California Department of Transportation (Department). Additionally, the Project Engineer will notify other service purveyors in the vicinity of the project improvements to verify that the proposed activities will not disrupt services to the community.

## **2.5 Traffic and Transportation/Pedestrian and Bicycle Facilities**

This section is based on the State Route 91 (SR-91) Westbound Widening Project between SR-91/State Route 55 (SR-55) Interchange through Tustin Avenue Overcrossing Traffic Analysis Report (California Department of Transportation [Department], May 2009) and discusses the impacts of the proposed project on traffic and circulation, both during construction (temporary impacts) and after completion of the project (long-term impacts).

Existing annual average daily traffic (AADT) data are based on volumes reported on the Freeway Performance Measurement System (PEMS) for 2007 conducted by the Department. Both existing average daily traffic (ADT) and peak-hour volumes are also based on the Caltrans Vehicle Count Report supplied by the PEMS. The freeway segment AADT and peak-hour volumes used in the analysis are directional volumes. Existing ramp ADT volumes were obtained from the Caltrans Traffic Volumes on California State Highways (2008). The freeway segment analysis, weaving analysis, and intersection analysis were conducted based on the Highway Capacity Manual (HCM) methodology using HCS2000 Software.

The project build-out year is 2015, and the project design year is 2035; traffic volumes for both the build-out year and the design year were derived by applying a growth factor to the existing volumes. The growth rate was based on the Orange County Transportation Analysis Model 3.2 developed and maintained by the Orange County Transportation Authority (OCTA).

### **2.5.1 Regulatory Setting**

The Department directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of highway projects. It further directs that the special needs of the elderly and disabled must be considered in all 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.

The Department is committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

## 2.5.2 Affected Environment

The existing roadway configuration and traffic conditions on SR-91 are described in detail in Section 1.2 of this Initial Study and are summarized in the following subsections.

### 2.5.2.1 Existing Roadway System

SR-91 is the only major transportation facility connecting Orange County and Riverside County. It is also a major link connecting the Los Angeles region with the Inland Empire, and SR-91 accommodates interstate traffic. As such, it is heavily used for goods movement, including throughput from the Ports of Los Angeles and Long Beach, commuter traffic between residential developments in the Inland Empire and employment centers in Orange and Los Angeles Counties, and interregional traffic, including weekend recreational traffic to Las Vegas and Colorado River destinations.

The proposed project study area includes the following intersections:

- Pacificcenter Drive/Tustin Avenue
- SR-91 westbound (WB) off-ramp/Tustin Avenue
- SR-91 eastbound (EB) off-ramp/Tustin Avenue

Existing pedestrian facilities within the project limits consist of sidewalks along both the east and west sides of Tustin Avenue and crosswalks located at the WB ramp intersections and the EB on-ramp intersection. The sidewalk on the west side of Tustin Avenue extends through the project limits from north of the WB on-ramp to Riverdale Avenue on the south. The sidewalk on the east side of Tustin Avenue extends from north of the WB off-ramp, and on the south it ends at the crosswalk at the EB on-ramp intersection. There are no on-street parking spaces within the project limits. SR-91 is an existing major highway and does not currently include a bicycle trail. However, there is an existing recreational trail within the project limits. The Santa Ana River Trail is located along the south side of the Santa Ana River and crosses under SR-91 within the project limits. No other modes of transportation exist or are proposed in the near future within the project limits.

Traffic volume is usually discussed in terms of ADT and/or peak hour volumes. The ability of a highway to accommodate traffic is typically measured in terms of level of service (LOS). LOS for freeway mainline is determined by traffic density based on criteria outlined in the Highway Design Manual (HDM). LOS is based on the ratio of traffic volume to the design capacity of the facility. LOS is expressed as a range from LOS A (free traffic flow with low volumes and high speeds, resulting in low

densities) to LOS F (traffic volumes exceed capacity and result in forced flow operations at low speeds, resulting in high densities). Pictorial representations of the six LOS for two-lane (Existing and No Build conditions) and multilane (proposed project) highways based on the 2000 HCM are provided in Table 1.1.

### **2.5.2.2 Traffic Conditions at Mainline and Interchanges**

Within the project limits, the existing (2008) ADT on SR-91 (WB direction) is approximately 113,200 vehicles, the constrained a.m. peak-hour volume is 7,619 vehicles, and the p.m. peak-hour volume is 7,123 vehicles. Truck traffic is estimated to be 6.5 percent of the total traffic, based on the 2006 Annual Average Daily Truck Traffic on the California State Highway System.<sup>1</sup>

#### ***Freeway Mainline***

Table 1.4, summarizes the existing LOS along the freeway for the without project scenario upstream (before) and downstream (after) of Tustin Avenue in the WB direction. Based on the peak-hour traffic volumes, the table shows that the SR-91 in the WB direction in the a.m. peak hour operates at LOS E (substantial delays) upstream of Tustin Avenue. Traffic demand in the project area is reaching capacity and mainline traffic is experiencing speed reductions and substantial delays.

#### ***Weaving Analysis***

Weaving occurs when traffic on the NB SR-55 connector merges left to the WB SR-91 mainline and when traffic on the WB SR-91 mainline merges right to access the Tustin Avenue off-ramp. Table 1.12 summarizes the existing density and weaving LOS along the section of the freeway between the NB SR-55 connector and Tustin Avenue off-ramp in the WB direction. Based on the weaving analysis, the table shows that SR-91 in the WB direction in the a.m. and p.m. peak hour operates at LOS F (substantial delays) between the NB SR-55 connector and Tustin Avenue off-ramp. Existing traffic volumes in the weaving area are at capacity and traffic in the weaving area is experiencing substantial speed reductions and delays.

#### ***Ramp Capacity***

The existing peak-hour and AADT data for ramps/connectors along SR-91 in the vicinity of the project are shown in Table 1.3. Based on existing traffic conditions and the Caltrans Highway Design Manual, the average capacity of single-lane on- and off-ramps without an auxiliary lane is approximately 1,500 vehicles per hour. The

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<sup>1</sup> <http://www.dot.ca.gov/hq/traffops/saferesv/trafdata/truck2006final.pdf>.

existing ramps are metered single-lane on-ramps with a capacity of 900 vehicles per hour. The Tustin Avenue on- and off-ramps that tie to the freeway mainline (WB) within the project limits were tested for their capacities against their existing volumes. Based on volumes shown in Table 1.3, the connector from NB SR-55 to WB SR-91 is operating at capacity.

The results of the existing intersection LOS analysis for the ramp intersections at Tustin Avenue and the intersection of Tustin Avenue/Pacificcenter Drive are summarized in Table 1.7. The analysis indicates that all intersections are currently operating at LOS D or better during peak traffic hours.

## **2.5.3 Environmental Consequences**

### **2.5.3.1 Temporary Impacts**

#### ***No Build (No Project) Alternative (Alternative 1)***

The No Build Alternative does not include a construction component and would retain the existing roadway. The No Build Alternative would not result in temporary changes to traffic volumes or circulation.

#### ***Build Alternatives (Alternatives 2 and 3)***

During construction, the Build Alternatives would temporary impact freeway and local circulation on SR-91 due to traffic diversions resulting from temporary ramp and lane detours. In addition, movement of construction vehicles has the potential to impact local circulation. Ramp closures would occur during off-peak periods and no adjacent interchange ramps would be closed at the same time.

The existing pedestrian crosswalk at the WB Tustin Avenue off-ramp will be temporarily detoured for a short period during construction of the ramp realignment.

The Santa Ana River Trail (SART) would be temporarily impacted during the construction phase of the project. The trail would be detoured for up to four months during construction of the widened portion of the SR-91/Santa Ana River Bridge above the trail. Full use of the trail would be restored following completion of the Santa Ana River bridge widening.

### **2.5.3.2 Permanent Impacts**

#### ***No Build Alternative***

The No Build Alternative does not include a construction component and would retain the existing roadway. Future routine maintenance activities would be implemented as needed. Existing conditions along SR-91 are congested in the WB

direction of travel during the a.m. peak period and in the EB direction of travel during the p.m. peak period. As growth continues, SR-91 will become increasingly congested unless capacity enhancements are made or additional corridors are created. The heavy traffic demand is projected to increase by 2035 within the project area. The increased traffic volumes, in conjunction with the limited capacity of the existing freeway, are expected to result in the deterioration of the LOS along SR-91. Based on the information contained in the traffic report, and as shown in Table 1.5 in Chapter 1, the No Build Alternative would not meet the purpose and need to enhance build-out year capacity (2015). The No Build Alternative would not affect any trails or crosswalks in the study area, as there would be no physical improvements.

### **Build Alternative 2**

No permanent impacts to trails or crosswalks are anticipated under Build Alternative 2 because the proposed project does not alter existing access or inhibit existing use of these facilities.

### **Build-Out Year (2015)**

#### *Freeway Mainline*

As shown in Table 2.5.1, the mainline would operate at acceptable LOS (D or better) with implementation of the proposed project in the Build-Out Year 2015.

**Table 2.5.1 Build-Out Year (2015) Freeway Mainline LOS Summary**

Build Alternative 2	Upstream			Downstream		
	Volume	Lanes	LOS (Density - pc/mi/l <sub>n</sub> )	Volume	Lanes	LOS (Density - pc/mi/l <sub>n</sub> )
AM Peak Hour	8,970	5	D (32)	6,580	4	D (28)
PM Peak Hour	8,370	5	D (34)	5,500	4	C (22)

Source: Department May 2009.

LOS = level of service

pc/mi/l<sub>n</sub> = passenger cars per mile per lane

#### *Weaving Analysis*

Alternative 2 would eliminate the mandatory lane change for traffic on the NB SR-55 connector to WB SR-91. However, the merging action for WB SR-91 off-ramp traffic to Tustin Avenue will remain.

#### *Ramp Capacity*

With the lane configuration proposed in Alternative 2, in 2015 all ramp traffic demands will be within capacity. Alternative 2 projected LOS for the various intersections within the project limits ranges from LOS C to LOS D (acceptable

levels) in 2015 (see Table 1.8). Traffic conditions at intersections within the project limits are not expected to improve in 2015 with Alternative 2 because the widening project does not include any improvements at the study intersections.

**Design Year (2035)**

**Freeway Mainline**

Traffic congestion through the project limits is expected to be reduced in 2035 with implementation of Alternative 2. Table 2.5.2 shows that for the mainline, the LOS would range from C to E in 2035. It is anticipated that traffic delays would be reduced from the No Build. However, due to the substantial increase in forecast traffic demand, traffic congestion will continue within the project limits even with implementation of Build Alternative 2.

With Alternative 2, the freeway segment both upstream and downstream of Tustin Avenue in the WB direction is projected to operate at LOS E in the a.m. peak hour and LOS D upstream and LOS C downstream of Tustin Avenue in the p.m. peak hour. Alternative 2 would reduce congestion along SR-91 in the WB direction between SR-55 and Tustin Avenue.

**Table 2.5.2 Design Year (2035) Freeway Mainline LOS Summary**

Build Alternative 2	Upstream			Downstream		
	Volume	Lanes	LOS (Density - pc/mi/ln)	Volume	Lanes	LOS (Density - pc/mi/ln)
AM Peak Hour	10,400	5	E (43)	7,630	4	E (36)
PM Peak Hour	9,720	5	D (34)	6,390	4	C (26)

Source: Department May 2009.

LOS = level of service

pc/mi/ln = passenger cars per mile per lane

**Weaving Analysis**

Alternative 2 would eliminate the mandatory lane change for the traffic on the NB SR-55 connector to WB SR-91. However, merging action for WB SR-91 off-ramp traffic to Tustin Avenue will remain to be required.

**Ramp Capacity**

With the lane configuration proposed in Alternative 2, in 2035 all ramp traffic demands will be within capacity with an exception for traffic on the connector from NB SR-55 to WB SR-91 which will operate at or near capacity during peak hours. With the implementation of Alternative 2, the projected LOS for the various intersections within the project limits ranges from LOS C to LOS E in 2035 (see

Table 1.9). Traffic conditions at intersections within the project limits are not expected to improve in 2035 with Alternative 2 because the widening project does not include any improvements at the study intersections.

**Build Alternative 3**

No permanent impacts to trails or crosswalks are anticipated under Build Alternative 3 because the proposed project does not alter existing access or inhibit existing use of these facilities.

**Build-Out Year (2015)**

*Freeway Mainline*

As shown in Table 2.5.3, the mainline would operate at acceptable LOS (D or better) with the implementation of Build Alternative 3 in the Build-Out Year 2015.

**Table 2.5.3 Build-Out Year (2015) Freeway Mainline  
Level of Service Summary**

Build Alternative 3	Upstream			Downstream		
	Volume	Lanes	LOS (Density - pc/mi/ln)	Volume	Lanes	LOS (Density - pc/mi/ln)
AM Peak Hour	8,700	6	C (24)	5,690	4	C (24)
PM Peak Hour	8,180	6	C (21)	4,680	4	C (19)

Source: Department May 2009.  
LOS = level of service  
pc/mi/ln = passenger cars per mile per lane

*Weaving Analysis*

Build Alternative 3 will eliminate the weaving movement that currently occurs when traffic on the NB SR-55 connector merges left to the WB SR-91 mainline and when traffic on the WB SR-91 mainline merges right to access the Tustin Avenue off-ramp.

*Ramp Capacity*

With the lane configuration proposed in Alternative 3, in 2015, all ramp traffic demands will be within capacity. The projected LOS for the various intersections within the project limits ranges from LOS C to LOS D in 2015 (see Table 1.8). Traffic conditions at intersections within the project limits are not expected to improve in 2015 with Alternative 3 because the widening project does not include any improvements at the study intersections.

**Pedestrian Facilities**

ADA requirements will be specifically applied to sidewalks, crosswalks and curb ramps at all ramp intersections modified by Alternative 3.

**Design Year (2035)**

**Freeway Mainline**

Traffic congestion through the project limits is expected to be reduced in 2035 with implementation of Alternative 3. As shown in Table 2.5.4, the freeway segment both upstream and downstream of Tustin Avenue in the WB direction is projected to operate at LOS D in the a.m. peak hour and LOS C in the p.m. peak hour with Build Alternative 3. Based on the LOS, it is anticipated that existing traffic delays will be substantially reduced with implementation of Build Alternative 3.

**Table 2.5.4 Design Year (2035) Freeway Mainline  
Level of Service Summary**

Build Alternative 3	Upstream			Downstream		
	Volume	Lanes	LOS (Density - pc/mi/ln)	Volume	Lanes	LOS (Density - pc/mi/ln)
AM Peak Hour	10,100	6	D (29)	6,600	4	D (29)
PM Peak Hour	9,490	6	C (25)	5,430	4	C (22)

Source: Department May 2009.

LOS = level of service

pc/mi/ln = passenger cars per mile per lane

With implementation of Alternative 3, the freeway segment both upstream and downstream of Tustin Avenue in the WB direction is projected to operate at LOS D in the a.m. peak hour and LOS C in the p.m. peak hour. Alternative 3 would reduce congestion along SR-91 in the WB direction between SR-55 and Tustin Avenue.

**Weaving Analysis**

The weaving movement that currently occurs when traffic on the NB SR-55 connector merges left to the WB SR-91 mainline and when traffic on the WB SR-91 mainline merges right to access the Tustin Avenue off-ramp will be eliminated in Build Alternative 3.

**Ramp Capacity**

With the lane configuration proposed in Alternative 3, in 2035, all ramp traffic demands will be within capacity, except for traffic on the connector from NB SR-55 to WB SR-91 which will be operating at or near capacity during peak hours.

Alternative 3 projected LOS for the various intersections within the project limits ranges from LOS C to LOS D in 2035 (see Table 1.9). Traffic conditions at intersections within the project limits are not expected to improve in 2035 with Alternative 3 because the widening project does not include any improvements at the study intersections.

#### *Pedestrian Facilities*

ADA requirements will be specifically applied to sidewalks, crosswalks and curb ramps at all ramp intersections modified by Alternative 3.

### **2.5.4 Avoidance, Minimization, and/or Mitigation Measures**

The following measure is required to minimize traffic and transportation impacts during construction.

**TRA-1** A Traffic Management Plan (TMP) will be included in the Plans, Specifications, and Estimates (PS&E) for implementation by the contractor prior to and during construction of any improvements. The TMP will consist of prior notices, adequate sign posting, detours, phased construction, and temporary driveways where necessary. The TMP will specify implementation timing of each Plan element (prior notices, sign posting, detours, etc.) as determined appropriate by the Department. The TMP will also address the temporary detour of the SART during construction of the widening of the State Route 91 (SR-91) bridge over the Santa Ana River. The SART detour plan will be included in the TMP. Adequate local emergency access will be provided at all times to adjacent uses. Proper detours and warning signs will be established to ensure public safety. The TMP will be devised so that construction will not interfere with any emergency response or evacuation plans. Construction activities will proceed in a timely manner to reduce impacts.

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## **2.6 Visual/Aesthetics**

A *Visual Impact Assessment* (VIA) (California Department of Transportation, District 12, Landscape Architecture Branch) February 2010 was prepared to assess the potential adverse visual impacts of the proposed project and to identify measures to avoid, minimize, and/or mitigate those adverse impacts. The VIA for the proposed project follows the guidance contained in the Federal Highway Administration's (FHWA) *Visual Impact Assessment for Highway Projects* (FHWA 1981) to assess visual impacts of proposed freeway improvements. The findings of the VIA are summarized in this section.

### **2.6.1 Regulatory Setting**

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

#### **2.6.1.1 California Scenic Highway Program**

California's Scenic Highway Program was established in 1963 through Senate Bill 1467. The purpose of this program is to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

Highway construction proposed on designated State Scenic Highways is evaluated in terms of the visual impact to scenic views. If major adverse impacts occur, then appropriate avoidance, minimization, and mitigation measures will be proposed. Generally, designating segments of a route as a scenic highway would not substantially alter the type of project proposed or the environmental compliance process. There are no special restrictions for construction or maintenance activities on scenic highways. However, Caltrans works with appropriate agencies to coordinate transportation proposals and maintenance activities and to ensure the protection of scenic corridors to the maximum extent feasible.

### **2.6.2 Affected Environment**

State Route 91 (SR-91) is a major east-west freeway that links the cities and communities of Orange, Riverside, and San Bernardino Counties. The Orange County Master Plan of Scenic Highways designates portions of SR-91 as a Type I Scenic Highway (Viewscape Corridor).

SR-91 is a State-Designated Scenic Highway from State Route 55 (SR-55) to east of the Anaheim city limits. The eastern portion of the State-Designated Scenic Highway lies on the floor of the Santa Ana River canyon adjacent to two Orange County recreational areas, Yorba Regional Park and Featherly Regional Park. The western portion of the State-Designated Scenic Highway (SR-91 between approximately Lakeview Avenue and SR-55) has some suburban development within the corridor. Views from this portion of the scenic highway lack any prominent visual resources, such as unique rock outcroppings, scenic vistas, scenic views, or historic buildings. However, the eastern portion of the scenic highway (SR-91 approximately east of Lakeview Avenue) is located along the banks of the Santa Ana River, with predominantly scenic views of cottonwood and oak tree groves and distant views of chaparral-covered hillsides. The eastern limits of the proposed project area on SR-91, approximately from SR-55 at post mile (PM) 9.1 to approximately PM 9.5, are located within the State-Designated Scenic Highway.

### **2.6.2.1 Visual Character**

Visual character is descriptive and nonevaluative. It is based on defined attributes that are neither good nor bad. A change in visual character cannot be described as having good or bad attributes until it is compared with the viewer response to that change. The visual character of the project limits, which includes SR-55 north to SR-91 westbound interchange, ramps, and slopes, is urban because the site is primarily existing highway and interchanges. The area surrounding the project limits includes residential, commercial, light industrial, and recreational land uses, and the visual character is urban in nature.

The visual environment of the project area consists primarily of views of suburban development in the City of Anaheim, the Santa Ana River bed, and the Peralta Foothills. The vegetation in the suburban areas in the City of Anaheim consists of ornamental plant materials. Background views include vegetation in the foothills consisting primarily of coastal sage scrub (CSS). The visual character of the background vegetation creates a distinctive view quality that is consistent with a high level of visual quality.

### ***Suburban River Basin Landscape Unit***

The Suburban River Basin is primarily composed of suburban development within the Santa Ana River basin. CSS dominates the natural hillsides. The ridgeline development introduces views of ornamental plantings. Riparian vegetation of the Santa Ana River provides a visual buffer for the manufactured channel. To the north

and south are views of rolling hills with suburban development, much of which is screened by vegetation. The ornamental vegetation complements the visual character of the native sagebrush scrub plant communities.

### 2.6.2.2 Visual Quality

Visual quality is evaluated by identifying the vividness, intactness, and unity present in the existing view, then comparing these three criteria with the view as modified by the Build Alternatives. The three criteria for evaluating visual quality are defined as follows:

- **Vividness** is the strength and how memorable the visual images and patterns are as distinct components of the landscape unit.
- **Intactness** is the visual value of the natural and unnatural landscape with the level of intrusive and encroachment components of the visual character upon the character of the setting. This applies to urban and rural landscape units.
- **Unity** is the logical visual connections, similarities and harmony of the elements that comprise the landscape unit. Sensitive design of individual components unifies the visual encroachment.

Three existing setting photographs, or key views, demonstrate general views of the project site. The key view location and directions are shown in Figure 2.6-1, and the key views are shown in Figures 2.6-2 through 2.6-4.

Table 2.6.1 provides quality ratings for the three key views. The existing quality rating (from 1 to 7, or very low to very high) is an average of the ratings assigned to the three visual character and quality criteria: vividness, intactness, and unity.

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**LEGEND**

-  Project Area Limits
-  City Boundary
-  Key View



SOURCE: Calltrans District 12 (February, 2010); Digital Globe (2008); RBF (05/2009)

F:\CDT0806A\GIS\KeyViewMap.mxd (11/4/2010)

FIGURE 2.6-1

*Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction*  
**Key View Location Map**

12-ORA-91 PM 7.9/9.5  
Project ID No. 120000078 (EA# 0C5600)

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**Existing view from westbound SR-91 east of northbound SR-55 connector.**



**View Simulation of proposed project Alternative 3.**

Note: Alternative 2 has no project elements at Key View 1.

FIGURE 2.6-2

*Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction*  
Key View 1  
12-ORA-91 PM 7.9/9.5  
Project ID No. 120000078(EA#0C5600)

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Existing view from westbound SR-91 east of Santa Ana River.



View Simulation of proposed project Alternative 2.



View Simulation of proposed project Alternative 3.

FIGURE 2.6-3

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Existing view from westbound SR-91 at the Tustin Avenue off ramp.



View Simulation of proposed project Alternative 2.



View Simulation of proposed project Alternative 3.

FIGURE 2.6-4

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### **Key View 1**

Key View 1 is from a motorist's perspective traveling west on SR-91 in the westbound lanes at the northbound SR-55 connector. Since this view is of a major highway and right-of-way landscaping, the existing visual quality of Key View 1 is rated 3.7, moderately low, as shown in Table 2.6.1. Because of the color and texture elements provided by the trees and plants on the north side of the road, the vividness is moderate. The intactness is moderately low because there are several negative visual elements, such as the bridge overcrossing, sound wall, drainage, pavement, and traffic that encroach upon the intactness of the view. The line elements formed by the road, striping, the shoulder, the wall, and the plants provide for a view with moderate unity.

### **Key View 2**

Key View 2 is from a motorist's perspective traveling northwest on SR-91 in the westbound lanes at the Santa Ana River Bridge. Similar to Key View 1, the visual quality is assessed with the understanding that the view is of a major highway in an urban area. The existing visual quality for Key View 2 is rated 2.2. As shown in Table 2.6.1, the existing vividness, intactness, and unity are rated low. This rating reflects the bridge deck and bridge rail, Santa Ana River Flood Control basins, and suburban development.

### **Key View 3**

Key View 3 is from a motorist's perspective traveling west on SR-91 in the westbound lanes at the Tustin Avenue off-ramp. Similar to Key Views 1 and 2, the visual quality is assessed with the understanding that the view is of a major highway in an urban area. The existing visual quality for Key View 3 is rated 3.7, moderately low, as shown in Table 2.6.1. Because of the color and texture elements provided by right-of-way landscaping on the north side of the road, the vividness is moderate. The intactness is moderately low because there are several negative visual elements, such as the Tustin Avenue bridge overcrossing, pavement, traffic, and artificially graded slopes that encroach upon the intactness of the view. The line elements formed by the road, striping, shoulder, artificially graded slopes, overcrossing bridge abutment, median K-rail, and the plants provide for a view with moderate unity.

#### **2.6.2.3 Viewer Groups and Viewer Response**

The proposed project would be viewed primarily by motorist consisting of local and regional daily commuters and travelers who use SR-91. Viewer exposure to the SR-91 project site from the road is high considering that approximately 113,200

vehicles travel westbound on this portion of Route 91 daily. Daily commuters may have increased awareness of views from the road due to the amount of time spent on the freeway each day.

The local streets are Tustin Avenue and Riverdale Avenue. All of these roadways cross over the freeway. The views from these roadways are generally east and west toward the roadway bridge structures, highway landscaping, and median plantings.

The residents on the south and east sides of SR-91 generally have views of the Santa Ana River Basin either from their private property or from local streets within the community. Project construction will affect the view from some of the surrounding residential development. Structural elements such as the existing sound wall along westbound SR-91 block views of the project area from surrounding residential development. However, some of the existing landscaping within state right-of-way is visible from the adjacent residential developments.

The Santa Ana River Trail runs east/west through the project area and intersects SR-91 on the south side of the River. The trail is at a lower elevation than SR-91, and views of the project area from the trail are limited to the bridge structure.

The Santa Ana River Lakes is a recreation fishing area northeast of the project area. Although project elements are visible from the recreational area, the focus direction of this viewer group is toward the lake.

The commercial areas are predominantly north of the Santa Ana River in the western portion of the project limits. There are existing drainage basins, roadways, utilities, bridges, overcrossings, power lines, and on- and off-ramps in the project area. The commercial uses have limited exposure to the views of SR-91 since their visual orientation is focused on the services being provided.

## **2.6.3 Environmental Consequences**

### **2.6.3.1 Temporary Impacts**

#### ***No Build Alternative***

The No Build Alternative would not involve any construction activity; therefore, it would not result in temporary impacts to existing views to and from adjacent areas, and no visual/aesthetic impacts would occur.

### **Alternatives 2 and 3**

The Build Alternatives would involve the use of construction equipment such as cranes and would involve the use of scaffolding other support structures. Therefore, the Build Alternatives may result in temporary aesthetic nuisances associated with construction activities.

Construction activities would include the removal of ornamental vegetation in some areas, staging of construction equipment and materials, truck hauling, excavation activity, and construction area signage. Consequently, landscaping removal during project construction will change the viewshed from residential properties located adjacent to the roadway. Construction of retaining walls adjacent to the freeway would require the use of heavy construction equipment. The resulting exposed surfaces, construction debris, and equipment and truck traffic may temporarily impact views of the roadway from the freeway (motorists) and from adjacent land uses.

The project area is well illuminated by the existing commercial and residential land uses, vehicle headlights, and highway security lighting. Short-term light and glare impacts associated with construction activities would likely be limited to lighting in the evening hours. Security lighting installed as part of the project would be directed into the roadway away from adjacent development and is not anticipated to adversely impact the project area. The project would require nighttime construction activities in some parts of the project area. Portable equipment would be used to light up the work areas. Lighting for nighttime construction activities would be directed away from adjacent land uses.

These construction impacts would be temporary and would cease upon project completion.

#### **2.6.3.2 Permanent Impacts**

##### ***No Build Alternative***

The No Build Alternative would maintain the existing roadway condition and would not alter existing views to and from the freeway.

##### ***Build Alternatives***

Table 2.6.1 shows a comparison of the changes to the three key views with implementation of the Build Alternatives.

### **Key View 1 – Alternative 2**

Alternative 2 has no project elements at Key View 1. Therefore, no changes would occur at Key View 1 as a result of Alternative 2.

### **Key View 1 – Alternative 3**

The proposed visual quality rating for this key view of westbound SR-91 at the northbound SR-55 connector is low (2.2, which is a reduction from the existing visual rating of 3.7). As shown in Figure 2.6-2, the slight reduction in visual quality is the result of the addition of two bypass lanes for the Tustin Avenue exit from westbound SR-91. The lane addition increases the width of the road/pavement, increases the view of vehicle activity (due to the additional lane), and removes some of the right-of-way landscaping, all of which reduce the view's vividness, intactness, and unity.

The predicted viewer response is moderate for the motorist viewer group. The number of viewers is very high, the viewing time is short (the time it takes a motorist to drive the length of the project), the distance from the viewer to the project is short, and the sensitivity of the viewer group is moderate. The loss of plants and trees and the increase in urban elements such as the roadway would change the existing view. The visual character would remain that of a freeway in an urban setting, and future conditions would become more similar to existing conditions as the project landscaping matures. Visual impacts would be minimized through implementation of aesthetic treatments such as vegetation and design enhancements.

### **Key View 2 – Alternative 2**

The proposed visual quality rating for this key view of westbound SR-91 at the Santa Ana River Bridge is very low (1.2), which is a reduction from the existing visual quality rating of 2.2. As shown in Figure 2.6-3, the slight reduction in visual quality is the result of the extension of one general-purpose lane from the two-lane northbound SR-55 to the westbound SR-91 connector to the Tustin Avenue interchange. The lane addition increases the width of the roadway pavement, increases the view of vehicle activity (due to the additional lane), and reduces the view of the Santa Ana River flood control basin. The visual character would remain that of a freeway in an urban setting.

The predicted viewer response is low for the motorist viewer group. The number of viewers is very high, the viewing time is short (the time it takes a motorist to drive the length of the project), the distance from the viewer to the project is short, and the sensitivity of the viewer group is moderate. Visual impacts would be minimized

through implementation of aesthetic treatments such as vegetation and design enhancements.

**Key View 2 – Alternative 3**

The proposed visual quality rating for this key view of westbound SR-91 at the Santa Ana River Bridge is very low (0.7), which is a reduction from the existing visual quality rating of 2.2. As shown in Figure 2.6-3, the reduction in visual quality is the result of the extension of one general-purpose lane from the two-lane northbound SR-55 to westbound SR-91 connector to the Tustin Avenue interchange and one auxiliary bypass lane initiated east of SR-55. The lane additions increase the width of the roadway pavement, increase the view of vehicle activity (due to the two additional lanes), and reduce the view of the Santa Ana River flood control basin, all of which reduce the view's visual quality. The visual character would remain that of a freeway in an urban setting.

The predicted viewer response is low for the motorist viewer group. The number of viewers is very high, the viewing time is short (the time it takes a motorist to drive the length of the project), the distance from the viewer to the project is short, and the sensitivity of the viewer group is moderate. Visual impacts would be minimized through implementation of aesthetic treatments such as vegetation and design enhancements.

**Key View 3 – Alternative 2**

The proposed visual quality rating for this key view of westbound SR-91 at the Tustin Avenue off-ramp is moderately low (3.2), which is a reduction from the existing visual quality of 3.7. As shown in Figure 2.6-4, the slight reduction in visual quality is the result of the additional general-purpose westbound lane. The lane extension increases the width of the roadway pavement and increases the view of vehicle activity (due to the additional lane).

The predicted viewer response is moderate for the motorist viewer group. The number of viewers is very high, the viewing time is short (the time it takes a motorist to drive the length of the project), the distance from the viewer to the project is short, and the sensitivity of the viewer group is moderate.

The loss of planting area and the wider roadway would increase urban elements and change the existing view. Visual impacts would be minimized by replacement vegetation that would mature over time. Visual impacts would be minimized through implementation of aesthetic treatments such as vegetation and design enhancements.

### **Key View 3 – Alternative 3**

The proposed visual quality rating for this key view of westbound SR-91 at the westbound Tustin Avenue off-ramp is moderately low (3), which is a reduction from the existing visual quality of 3.7. As shown in Figure 2.6-4, the reduction in visual quality is the result of the additional westbound general-purpose lane. The lane extension increases the width of the roadway pavement and increases the view of vehicle activity (due to the additional lane).

The predicted viewer response is moderate for the motorist viewer group. The number of viewers is very high, the viewing time is short (the time it takes a motorist to drive the length of the project), the distance from the viewer to the project is short, and the sensitivity of the viewer group is moderate.

The loss of planting area and the wider roadway would increase urban elements and change the existing view. The visual character would remain that of a freeway in an urban setting, and future conditions would become more similar to existing conditions as the project landscaping matures. Visual impacts would be minimized through implementation of aesthetic treatments such as vegetation and design enhancements.

**Table 2.6.1 Existing and Proposed Visual Quality**

Key View	Existing Visual Quality				Alternative 2 Proposed Visual Quality				Alternative 3 Proposed Visual Quality				Difference from Existing Visual Quality	
	Vividness (V)	Intactness (I)	Unity (U)	Existing (E) Visual Quality $([V+I+U]/3)$	Vividness (V)	Intactness (I)	Unity (U)	Existing (E) Visual Quality $([V+I+U]/3)$	Vividness (V)	Intactness (I)	Unity (U)	Existing (E) Visual Quality $([V+I+U]/3)$	Alt. 2	Alt. 3
1	Moderate 4	Moderately Low 3.5	Moderately Low 3.5	Moderately Low 3.7	N/A	N/A	N/A	N/A	Low 2.5	Low 2	Low 2	Low 2.2	N/A	-1.5
2	Low 2.5	Low 2	Low 2	Low 2.2	Very Low 1.5	Very Low 1	Very Low 1	Very Low 1.2	Very Low 1	Very Low 0.5	Very Low 0.5	Very Low 0.7	-1	-1.5
3	Moderate 4	Moderately Low 3.5	Moderately Low 3.5	Moderately Low 3.7	Moderately Low 3.5	Moderately Low 3	Moderately Low 3	Moderately Low 3.2	Moderately Low 3.5	Moderately Low 3	Moderately Low 3	Moderately Low 3.2	-0.5	-0.5

Rating Scale: 1–7 (1=very low, 2=low, 3=moderately low, 4=moderate, 5=moderately high, 6=high, 7=very high).

Source: Visual Impact Assessment on Westbound (WB) State Route 91 Auxiliary Lane from the Northbound (NB) SR-55/WB SR-91 Connector to the Tustin Avenue Interchange (California Department of Transportation District 12, February 2010)

### **Summary of Project Impacts**

The above analysis indicates that the Build Alternatives would have a low to moderate visual impact on each of the three key views. Both Build Alternatives include roadway widening and construction of retaining walls that would result in a visual impact and a decrease in visual quality within the project limits. However, Alternative 3 would have a greater visual impact than Alternative 2 because it would widen the roadway by one additional lane and construct three more retaining walls than would be constructed under Alternative 2. The visual simulations for the postproject conditions at each of the key views show that both Build Alternatives would result in a general degradation of the visual environment. The visual character would remain that of a freeway in an urban setting, and future conditions would become more similar to existing conditions as the project landscaping matures.

#### *Impacts to Scenic Highways*

The eastern limits of the proposed project, east of SR-55, are located within a State-Designated Scenic Highway. While the eastern limits of the proposed project are within the State-Designated Scenic Highway, all project improvements are at grade and construction of the Build Alternatives would not block views of surrounding hillsides or natural features within the canyon. Additionally, any alteration in views from the portion of the project area within the Scenic Highway would alter views of existing urban areas but would not alter the background views of the San Gabriel Mountains or the Peralta Hills. Therefore, any impacts to views from the Scenic Highway would be considered less than significant and would be lessened by implementation of the minimization measures below.

#### *Impacts to Recreational Uses*

The Santa Ana River Trail intersects SR-91 between the SR-55 interchange and Tustin Avenue off-ramp on the south side of the Santa Ana River. Implementation of the proposed Build Alternatives would widen the bridge over the Santa Ana River and recreational trail. The existing views of the project area from the trail consist of views of the Santa Ana River bridge, and proposed views would consist of a bridge that is widened. Therefore, the impact to the Santa Ana River Trail recreational user's viewer group would be considered minimal for both Build Alternatives.

Although project elements are visible from the Santa Ana River Lakes fishing and recreational area, the focus direction of the users of this facility is toward the lake. Additionally, this resource currently has views of SR-91. Implementation of the proposed Build Alternatives would not substantially alter existing views from the

Santa Ana River Lakes, and recreational users would continue to have views of transportation uses. Therefore, any impact to the Santa Ana River Lakes recreational uses would be considered minimal.

#### *Light, Glare, Shade, and Shadow*

The study area receives light at night from traffic and street lighting; signalization at the intersections and freeway on- and off-ramps; commercial zone lighting; and limited light sources from residential development. The proposed project would increase the number of vehicles on SR-91, thereby increasing the amount of nighttime light on SR-91. Existing light fixtures on SR-91 and along the ramps may require relocation as part of the proposed project. However, no additional lighting is proposed. Any relocated lighting would comply with Measure V-4 which requires lighting to be directed on the road and ramp facilities and away from adjacent land uses. Additionally, the project will comply with Department Standard Construction Specifications, reducing any potential light and glare impacts during construction.

#### **2.6.4 Avoidance, Minimization, and/or Mitigation Measures**

Implementation of the following minimization measures would reduce potential impacts on the visual environment resulting from construction of Alternatives 2 and 3. The following are treatment and design considerations for the minimization requirements.

- V-1 Trees.** The California Department of Transportation (the Department) will save existing mature trees where practical as identified in the Landscape Plan.
- V-2 Landscape Plan.** A Landscape Plan shall be prepared to minimize visual impacts prior to completion of project plans, specifications, and estimates. The Landscape Plan will be submitted for approval by the California Department of Transportation (the Department) District 12 Landscape Architecture Branch. Preparation of the Landscape Plan will be coordinated with the City of Anaheim.

The Landscape Plan will include the following components, as feasible:

- Incorporation of applicable procedures and requirements as detailed in the publication “Caltrans Highway Design Manual, Topic 902, Highway Planting Standards and Guidelines” (September 2006), and the Orange County General Plan.

- Identification of areas within or adjacent to the project limits for revegetation, including landscaping for graded areas with noninvasive plant species consistent with adjacent vegetation to the greatest extent possible. The landscape plant palette shall not contain species that have been identified as invasive by the California Invasive Plant Council (Cal-IPC) and the United States Department of Agriculture (USDA), at a minimum.
- Planting of trees and shrubs is required along State Route 55 (SR-55) and State Route 91 (SR-91) to enhance the visual character and quality of the area.
- Planting shall include a 3-year plant maintenance/replacement establishment period.
- Water quality features are to be visually compatible by vegetative screening and placement. These elements need to be consistent with the considerations in the “Master Plan of Freeway and Transit Corridor Enhancements: Creating a Quality Environment Along Orange County’s Transportation Network.”

**V-3 Retaining Walls.** Retaining walls will incorporate aesthetic treatments such as colored concrete and the use of natural materials and forms that complement the surrounding environment. At the discretion of the District Landscape Architect, wall design elements will be consistent with the Master Plan of Freeway and Transit Corridor Enhancements: Creating a Quality Environment Along Orange County’s Transportation Network, City of Anaheim planning documents, and input received from the City of Anaheim.

**V-4 Lighting Plan.** The lighting fixtures will be selected and installed to minimize glare on adjacent properties and into the night sky. Lighting will be shielded with nonglare hoods and focused within the project State right-of-way (ROW) for State Route 91 (SR-91). The lighting plan will be reviewed and approved by the California Department of Transportation (the Department) District 12 Landscape Architect prior to construction to ensure compliance with these criteria.

## **2.7 Cultural Resources**

### **2.7.1 Regulatory Setting**

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

### **2.7.2 Affected Environment**

This section is based on the Historic Resources Compliance Report (HRCR) (January 2010) and the Archaeological Survey Report (ASR) (December 2009).

The Project Area Limits (PAL) for the project were established in November 2009 and include the limits of the proposed construction and staging areas for Build Alternatives 2 and 3.

The methodology used to support the conclusions in the HRCR and ASR included field surveys, Native American consultation, and a records search conducted at the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS), located at California State University, Fullerton. The records search included a review of all recorded historic and prehistoric archaeological sites within a 0.25-mile (mi) radius of the PAL as well as a review of known cultural resource survey and excavation reports. In addition, the following inventories were examined:

- National Register of Historic Places
- California Register of Historical Resources

- California Historical Landmarks
- California Points of Historical Interest

No archaeological sites or historic resources have been identified within a 0.25 mi radius of the PAL. Three prehistoric isolated finds have been documented between 0.12 and 0.2 mi from the PAL. Isolated finds 30-100473, 30-100474, and 30-100475 were all documented while monitoring grading of a construction project north and west of the PAL.

Ten cultural resource studies have been conducted within a 0.25 mi radius of the PAL. Seven of these studies include portions of the current PAL. Approximately 75 percent of the PAL had been previously surveyed.

A site visit and survey of the PAL were conducted on September 4, 2009. The PAL is located within an urban environment and have been completely disturbed by prior land uses and developments. No prehistoric or historic cultural material was observed, nor were any historic buildings present. No historic properties were identified within the PAL.

#### **2.7.2.1 Native American Consultation**

Native American consultation was initiated in March 2009, with 8 Native American individuals and groups recommended by the Native American Heritage Commission (NAHC). The following groups and individuals were contacted by letter on March 27, 2009:

- Sam Dunlap
- Gabrielino Tongva Nation: Sam Dunlap, Tribal Secretary
- Ti'At Society: Cindi Alvitre
- Gabrielino Band of Mission Indians of California: Susan Frank
- Tongva Ancestral Territorial Tribal Nation: John Tommy Rosas, Tribal Administrator
- Gabrielino Tongva Indians of California Tribal Council: Robert Dorame, Tribal Chair/Cultural Resources
- Gabrielino/Tongva San Gabriel Band of Mission Indians: Anthony Morales, Chairperson
- Gabrielino Tongva Indians of California Tribal Council: Mercedes Dorame, Tribal Administrator

The letters discussed the project and requested information on Native American heritage resources.

Letters were followed by telephone calls and emails during April 2009. Mr. Rosas requested full Section 106 consultation that all project-related documents be submitted to the Tribe for review. He also stated his opposition to the project based on its location in a very sensitive area and the potential for there to be “many negative impacts.” Mr. Morales recommended monitoring by an archaeologist and a Native American when ground-disturbing activities are conducted in undisturbed native soil because these soils could be sensitive for cultural resources. No other responses were received.

### **2.7.3 Environmental Consequences**

#### **2.7.3.1 Temporary Impacts**

##### *Alternative 1 (No Build)*

The No Build Alternative does not involve any construction activities or improvements; therefore, no temporary impacts to cultural resources would occur.

##### *Build Alternatives 2 and 3*

The Build Alternatives would require ground disturbance and modification to existing freeway structures and within the Santa Ana River Channel. These construction activities could result in impacts to unknown buried cultural materials or human remains. Any impacts to buried resources would be considered permanent; therefore, an analysis of temporary impacts is not applicable.

#### **2.7.3.2 Permanent Impacts**

##### *Alternative 1 (No Build)*

Because there would be no disturbance to the project site, the No Build Alternative would not result in any adverse impacts related to historical resources and/or archaeological resources.

##### *Build Alternatives 2 and 3*

Since no cultural resources were identified within or immediately adjacent to the PAL, there would be no adverse impacts related to cultural resources from the construction of either of these alternatives.

Although considered unlikely, there is a potential to encounter unknown buried cultural materials or human remains within the PAL during construction of the Build Alternatives. In the event that previously unknown cultural materials or human

remains are encountered during construction, compliance with Measures CR-1 and CR-2 would avoid and/or minimize potential impacts to previously unknown cultural resources or human remains.

#### **2.7.4 Avoidance, Minimization, and/or Mitigation Measures**

The minimization measures below would substantially reduce the potential for impacts related to the discovery of previously unknown cultural materials and human remains during construction of Alternatives 2 and 3.

**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 disturbance and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner shall be contacted. Pursuant to Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the Coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendant (MLD). At this time, the person who discovered the remains will contact the California Department of Transportation, District 12 Environmental Analysis Branch, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

## **2.8 Hydrology and Floodplains**

### **2.8.1 Regulatory Setting**

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative.

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/restore any beneficial floodplain values impacted 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.”

The Santa Ana Regional Water Quality Control Board designates the section of the Santa Ana River at the SR-91 crossing as Reach 2. The same section of the Santa Ana River is designated as Reach 7 by the U.S. Army Corps of Engineers. To maintain consistency with other sections of this document and to eliminate confusion only the “Reach 2” designation will be used in this section, but both designations are implied.

### **2.8.2 Affected Environment**

The information contained in this section is derived from the Location Hydraulic Study (November 2010) which was prepared for this project in compliance with 23 CFR Part 650 Subpart “A”.

The land uses within and adjacent to the project are detailed in the City of Anaheim’s General Plan and are listed as being: Low and medium density residential, commercial, light industrial, institutional, mixed use, and non-recreational mixed use. However there are no occupied structures or commercial/industrial structures within the 100 year floodplain.

Floodplains and wetlands in their natural or relatively undisturbed state provide natural and beneficial resource values (e.g., fish, wildlife, plants, open space, natural

beauty, scientific study, outdoor recreation, agriculture, natural moderation of floods, water quality maintenance, and groundwater recharge).

In the area of the project the Santa Ana River is a manufactured channel with an earthen bottom with little or no vegetation contained within the channel. The small amount of vegetation present consists of upland ruderal vegetation. As discussed in the Jurisdictional Delineation Report, the Santa Ana River is considered a deepwater aquatic water, which is recognized as having a high habitat value and living resource value due to use as a fish and wildlife resource and limited distribution in the arid west. However, the Santa Ana River's location at the project is seasonally dry and does not have any fish populations. The lack of sustained water flows and vegetation also presents limited forging/nesting habitat for wildlife and waterfowl.

The floodplain within/immediately adjacent to the project limits supports two venues of recreation. The first is the Santa Ana River Trail, which is a bicycle route, and the nearby, Santa Ana River Lakes. The Santa Ana River Trail is a bicycle route that travels longitudinally along the south/southwest shore of the Santa Ana River and passes under the SR-91 Bridge at the Santa Ana River. North of the SR-91 Santa Ana River Bridge, the Santa Ana River Lakes encompass ground water recharge basins which are also used as publicly accessible recreational fishing areas.

Within the project area, the 180' wide State Route 91 (SR-91) Bridge perpendicularly crosses Reach 2 of the Santa Ana River which is within the 100-year floodplain. According to Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06059C0152J, December 3, 2009, the Santa Ana River 100-year floodplain at this location is designated as Zone A (Zone A is a 1 percent annual chance floodplain with no base flood elevations determined). According to the FIRM, a 100-year flood discharge would be contained within the existing Santa Ana River channel. The FEMA FIRM is shown in Figure 2.8-1.

Beneficial uses as identified by the Santa Ana Regional Water Quality Control Board's (RWQCB) Water Quality Control Plan for this Reach of the Santa Ana River (Basin Plan, updated February 2008) are identified as the following:

- GWR: Groundwater Recharge
- REC-1: Body-contact recreations (swimming/wading)
- REC-2: Non-body contact recreation (boating/fishing)
- WARM: Warm water habitat for fish amenable for reproduction in warm water
- WILD: Habitat for wild plants and animals

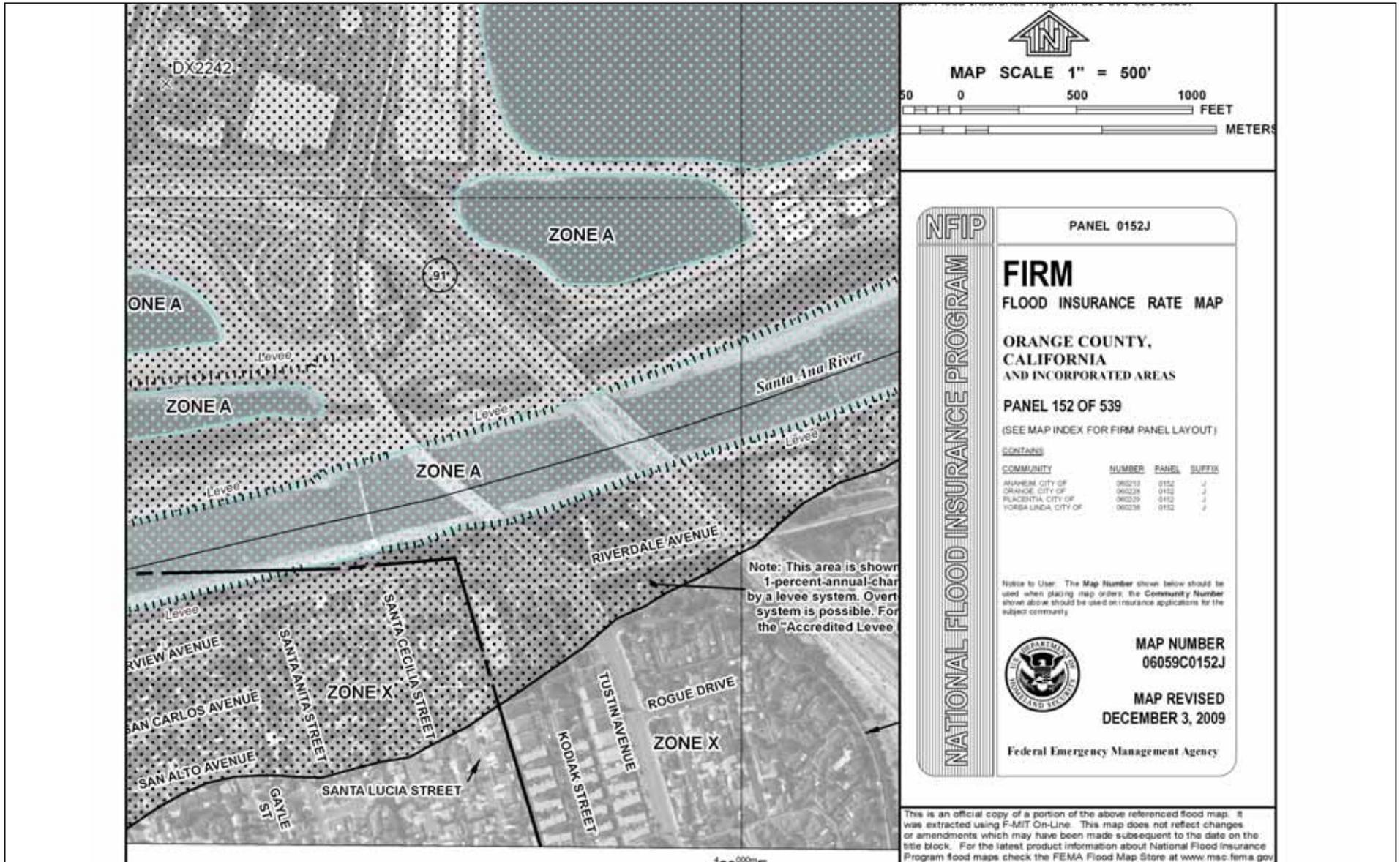


FIGURE 2.8-1

Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction

FEMA Map

12-ORA-91 PM 7.9/9.5

Project ID No. 1200000078(EA#0C5600)

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- RARE: Habitat for rare (threatened/endangered) plants and animals
- AGR: Agricultural use

### **2.8.3 Environmental Consequences**

To analyze potential impacts to the floodplain and perform a risk assessment of the proposed bridge widening, the existing U.S. Army Corps of Engineers HEC-RAS Hydraulics Model for the 100-year flood condition in the Santa Ana River Reach 2 was compared to the same model with appropriate modifications to account for the proposed project. Because Alternative 3 results in the largest change to the footprint at the Santa Ana River and greatest potential for impacts, Alternative 3 is the basis for the hydraulic model as the representative alternative. Conclusions drawn herein for Alternative 3 are also conservatively considered as applicable to Alternative 2.

#### **2.8.3.1 Temporary Impacts**

##### ***Alternative 1 (No Build)***

The No Build Alternative would not result in the construction of any improvements within the Santa Ana River channel. Therefore, the No Build Alternative would not result in temporary adverse impacts related to natural and beneficial floodplain values.

##### ***Build Alternatives 2 and 3***

Temporary hydraulic related potential impacts to the 100-year floodplain would include the possibility of a moderate stream diversion should there be a rain event during the dry season work schedule, and minimal potential impact to biological resources. With the implementation of avoidance and minimization measures as outlined in section 2.9 Water Quality and Storm Water Runoff, Section 2.15 Biological Resources, including resource agency permit conditions, there will be no temporary impacts to the natural and beneficial floodplain values resulting from potential hydraulic changes in the project area; including ground water recharge or recreational fishing.

#### **2.8.3.2 Permanent Impacts**

##### ***Alternative 1 (No Build)***

The No Build Alternative would not result in the construction of any improvements within the Santa Ana River channel. Therefore, the No Build Alternative would not result in permanent adverse impacts to the natural and beneficial floodplain values.

### **Build Alternatives 2 and 3**

The extension of the Santa Ana River channel piers for the SR-91 Bridge widening would result in only a transverse encroachment (i.e., perpendicular to the direction of flow), of the Santa Ana River 100-year floodplain. Therefore, there would be no impacts from a longitudinal encroachment.

The existing Santa Ana River channel is capable of conveying the 100-year flood with approximately 8.4 ft of freeboard (the clearance between the lowest structural member of the bridge and the river's water surface level during a 100-year flood event). The maximum increase in the Santa Ana River's surface level in the 100-year flood due to the proposed improvements would be approximately 0.29 ft, which would occur approximately 240 ft upstream of the proposed northern side of the bridge. The water surface elevation would return to existing conditions approximately 5,000 ft upstream of the bridge. The outside edge of the proposed widened portion of the bridge (29' wide) will slope down toward the river at a 2% cross-slope. This cross-slope drop will result in the proposed widened section of bridge deck being slightly lower than the existing bridge deck height. Both of these factors, the drop in the bridge deck height and the nominal potential increase in water surface level during a 100-year flood from the existing 100-year flood surface level, will change the freeboard (the clearance between the lowest structural member of the bridge and the river's water surface level during a 100-year flood event) from the existing 8.4 ft to approximately 7.7 ft.

After widening of the bridge and extension of the bridge channel piers, a 100-year flood containment would be maintained within the Santa Ana River channel, and the proposed bridge would continue to have sufficient freeboard. By maintaining adequate freeboard (7.7 ft), the proposed project would not result in flood-related interruption of emergency vehicles utilizing the bridge. There are no occupied structures nor any commercial/industrial structures or uses within the 100-year floodplain at the SR-91 Bridge over the Santa Ana River, or violations/impacts to existing National Flood Insurance Program elements. Thus the Build Alternatives does not support/promote incompatible floodplain development.

The Build Alternatives would result in a net increase in impervious surfaces and an increase in surface runoff from the bridge. The runoff from the proposed roadway improvements would have the potential to impact the beneficial uses of the Santa Ana River as defined by the Regional Water Quality Control Board (as discussed in Section 2.9 Water Quality and Storm Water). Although this is a potential water

quality impact, there will be no change to the hydrology of the area or impact to 100-year flood conditions.

The Natural and Beneficial Floodplain Values that currently exist at SR-91 Bridge at the Santa River will not be affected by the nominal hydraulic changes from the implementation of the Build Alternatives. The existing limited foraging/nesting opportunities for wildlife and water fowl, ground water recharge capacity of nearby basins, recreational fishing at the Santa Ana Lakes, use of the Santa Ana River Trail, water quality maintenance, natural moderation of floods or any other use will not be adversely impacted by the nominal change in the hydrology by implementation of the Build Alternatives.

Given the above discussion, there would be no longitudinal encroachments, no substantial flood-related risks to life or property, and no impacts to natural and beneficial floodplain values associated with implementation of the Build Alternative. Based on the risk assessment in the *Location Hydraulic Study*, the project is considered “low” risk. “Significant encroachment,” as defined in 23 Code of Federal Regulation (CFR) 650.105(q), is a highway encroachment that would result in (1) a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community’s only evacuation, (2) a significant risk, or (3) a significant adverse impact on natural and beneficial floodplain values. The proposed encroachment would not result in any adverse impacts on the natural and beneficial floodplain values, would not result in a substantial change in flood risks or damage, and does not have substantial potential for interruption or termination of emergency services or emergency routes. Therefore, the proposed project does not constitute a significant floodplain encroachment as defined in 23 CFR 650.105(q).

#### **2.8.4 Avoidance, Minimization, and/or Mitigation Measures**

Measures to minimize temporary construction impacts and long-term operational impacts on the natural and beneficial floodplain values are addressed in Section 2.9, Water Quality and Storm Water Runoff, and Section 2.15, Biological Resources. No additional avoidance, minimization, and compensatory measures for impacts resulting from the nominal change to hydraulics of the 100-year floodplain are required.

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## **2.9 Water Quality and Storm Water Runoff**

### **2.9.1 Regulatory Setting**

Section 401 of the Clean Water Act requires water quality certification from the State Water Resource Control Board (SWRCB) or a Regional Water Quality Control Board (RWQCB) when the project requires a Federal permit. Typically this means a Clean Water Act Section 404 permit to discharge dredge or fill into a water of the United States, or a permit from the Coast Guard to construct a bridge or causeway over a navigable water of the United States under the Rivers and Harbors Act. The 401 water quality certification must convey that the project will comply with the water quality standards, including beneficial uses, water quality objectives, and the state antidegradation policy.

Along with Clean Water Act Section 401, Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) for the discharge of any pollutant into waters of the United States. The federal Environmental Protection Agency has delegated administration of the NPDES program to the SWRCB and the nine RWQCBs. To ensure compliance with Section 402, the SWRCB has developed and issued the Department an NPDES Statewide Storm Water Permit to regulate storm water and non-storm water discharges from Department' right-of-way, properties and facilities. This same permit also allows storm water and non-storm water discharges into waters of the State pursuant to the Porter-Cologne Water Quality Act.

Storm water discharges from the Department's construction activities disturbing one acre or more of soil are permitted under the Department's Statewide Storm Water NPDES permit. These discharges must also comply with the substantive provisions of the SWRCB's Statewide General Construction Permit. Non-Departmental construction projects (encroachments) are permitted and regulated by the SWRCB's Statewide General Construction Permit. All construction projects exceeding one acre or more of disturbed soil require a Storm Water Pollution Prevention Plan (SWPPP) to be prepared and implemented during construction. The SWPPP, which identifies construction activities that may cause discharges of pollutants or waste into waters of the United States or waters of the State, as well as measures to control these pollutants, is prepared by the construction contractor and is subject to Department review and approval.

Finally, the SWRCB and the RWQCBs have jurisdiction to enforce the Porter-Cologne Act to protect groundwater quality. Groundwater is not regulated by Federal law, but is regulated under the state's Porter-Cologne Act. Some projects may involve placement or replacement of on-site water treatment systems (OWTS) such as leach fields or septic systems or propose implementation of infiltration or detention treatment systems which may pose a threat to groundwater quality. Currently the OWTS program is without SWRCB regulation but you should be aware of threats to groundwater quality on the project site and evaluate and address accordingly in the environmental document. Design standards for installation and operation of infiltration and detention treatment systems should protect groundwater quality and those protections should also be addressed in the environmental document.

## **2.9.2 Affected Environment**

The Water Quality Assessment Report (WQAR) (February 2010) that was prepared for this project provided the basis for the information contained in this Section 2.9 Water Quality and Storm Water Runoff of this document.

### **2.9.2.1 Surface Water**

The project area is located within the Santa Ana Narrows Subwatershed of the Lower Santa Ana River Watershed. The project area crosses Reach 2 of the Santa Ana River between the State Route 91 (SR-91)/Tustin Avenue interchange and the SR-91/State Route 55 (SR-55) junction. The Santa Ana River, Reach 2, is defined as the length of the River from 17th Street in Santa Ana to the Prado Dam. Within the project area, runoff from SR-91 discharges into drainage inlets, which discharge to the Santa Ana River, Reach 2, via various culverts.

Currently, there is no engineered water quality treatment provided in the project area. Although storm water does generally drain in some areas to adjacent existing landscape areas that act as biofiltration strips or biofiltration swales, there are no preexisting water quality treatment facilities within the project area.

Reach 2 of the Santa Ana River is not listed as impaired on the 2006 Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments. In addition, there are

no existing or proposed Total Maximum Daily Loads (TMDLs)<sup>1</sup> for Reach 2 of the Santa Ana River.

The Porter-Cologne Act establishes a regulatory program to protect water quality and to protect beneficial uses of State waters. It empowers the RWQCBs to formulate and adopt, for all areas within their jurisdiction, a Basin Plan that designates beneficial uses and establishes such water quality objectives that in its judgment will ensure reasonable protection of beneficial uses. The following beneficial uses are identified in the Basin Plan for Reach 2 of the Santa Ana River. The beneficial uses include the following:

- GWR: Groundwater Recharge
- REC-1: Body-contact recreations (swimming/wading)
- REC-2: Non-body contact recreation (boating/fishing)
- WARM: Warm water habitat for fish amenable for reproduction in warm water
- WILD: Habitat for wild plants and animals
- RARE: Habitat for rare (threatened/endangered) plants and animals
- AGR: Agricultural use

### **2.9.2.2 Groundwater**

The project is within the Santa Ana River – Orange Groundwater Management Zone per the Santa Ana RWQCB Basin Plan.

The primary source of groundwater in the project vicinity is the Santa Ana River. Secondary sources of groundwater include springs, runoff from the hills, and developed areas adjacent to SR-91.

Historic records show that the shallow groundwater at the project site can be as close as 9.8 feet (ft) below the ground surface (bgs), increasing to approximately 29 ft bgs near the south end of the Peralta Hills. The groundwater levels may vary since the site is adjacent to percolation basins maintained by the Orange County Water District (OCWD) for the purpose of recharging the groundwater basin. A nearby California

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<sup>1</sup> The TMDL is the total amount of a constituent that can be discharged while meeting water quality objectives and protecting beneficial uses. It is the sum of the individual load allocations for point-source inputs (e.g., an industrial plant), load allocations for nonpoint-source inputs (e.g., runoff from urban areas), and the natural background with a margin of safety included.

Department of Water Resources (DWR) monitoring well has recorded groundwater elevations varying from 54 to 140 ft bgs. The most recent measurement at this well indicates that water is approximately 95 ft bgs. These variations are caused by changes to groundwater pumping, irrigation, seasonal rainfall, climatic variations, and use of the basins for recharge. The groundwater table elevation above mean seal level (amsl) measured 231 ft during the Riverdale (Batavia) Street overcrossing investigation in 1965, between 214 and 210 ft at the southeast and northwest side of Santa Ana River bridge widening in 1965, 200 ft during the Tustin Avenue original construction investigation in 1965, and between 193 and 194 ft for the Tustin Avenue widening project in 2002.

As listed in the RWQCB's Basin Plan, the Orange Groundwater Management Zone beneficial uses include:

- MUN: Municipal and Domestic Supply
- AGR: Agricultural use
- IND: Industrial Service Supply
- PROC: Industrial Process Supply

As stated above, a portion of the project is adjacent to a section of the Santa Ana River that is used by the OCWD for recharging the groundwater basin. The majority of the project is downstream of the recharging basins. However, a portion of Tustin Avenue (northeast of the existing interchange and the westbound lanes of the SR-91 overcrossing of the Santa Ana River, from midpoint of the River crossing to Tustin Avenue) drains to one of the basins. This section of the project area is considered a "high risk" area, defined as a location where spills from the State-owned rights-of-way, activities, or facilities can discharge directly to municipal or domestic water supply reservoirs or groundwater recharge basins.

## **2.9.3 Environmental Consequences**

### **2.9.3.1 Temporary Impacts**

#### ***Alternative 1 (No Build)***

Under Alternative 1, no improvements other than routine roadway and bridge maintenance would be made. Therefore, Alternative 1 would result in no short-term water quality impacts from construction-related activities.

### **Build Alternatives 2 and 3**

Pollutants of concern that could be generated during construction include sediments (grading operations), trash (construction workers and construction waste), petroleum products (equipment), concrete waste (dry and wet), sanitary waste (portable toilets), and chemicals (equipment coolant, concrete curing compounds, pesticides, and herbicides).

During construction, the total disturbed area from the proposed project is estimated to be 4.4 acres (ac) for Alternative 2 and 7.8 ac for Alternative 3.

In addition, appropriate construction site BMPs for work within high-risk areas, such as immediately adjacent to and within the Santa Ana River, would be identified in the SWPPP. Both Build alternatives would widen the westbound side of the SR-91 over the Santa Ana River, including new piers and culvert extensions, that could result in potential impacts to the water body unless temporary Construction BMPs are implemented. Alternative 3 would require more grading due to construction of the new off-ramp to Tustin Avenue parallel to the SR-55/SR-91 connector. Shoring and temporary stream diversion may be necessary to construct the new foundation for the bridge piers. Construction of these elements should be avoided during periods of high flows within the Santa Ana River whenever possible. With implementation of the Construction BMPs as presented in Measure WQ-2, no adverse water quality impacts would occur during construction of the proposed project.

Groundwater dewatering may be necessary to construct structure footings and culvert extensions. Dewatered groundwater may contain high levels of total dissolved solids (TDS), salinity, high nitrates, or other contaminants, which could be introduced to surface waters during construction. Groundwater and any other non-storm water dewatering activities are subject to the requirements of the De Minimus Permit (Order No. R8-2009-0003) or subsequent permit. Compliance with this permit, as stipulated in Avoidance, Minimization, and/or Mitigation Measure WQ-5, would avoid adverse impacts to water quality via dewatering. The dewatering may require the use of BMPs, such as siltation discharge bags or baker tanks, to remove potential pollutants that may be in the dewatering effluent.

#### **2.9.3.2 Permanent Impacts**

##### **Alternative 1 (No Build)**

Under Alternative 1, the proposed project would not be constructed, and there would not be any increase in impervious area or change in land use on the SR-91 as a result

of this project. Therefore, Alternative 1 would not result in an increase in long-term pollutant loading; however, existing runoff would remain untreated.

### ***Build Alternatives 2 and 3***

Pollutants of concern typically generated during the operation of a transportation facility include sediment/turbidity, nutrients, organic compounds, trash and debris, oxygen-demanding substances, bacteria and viruses, oil and grease, pesticides, and metals. Because the project consists of lane additions, it would result in a permanent increase in impervious surfaces and a permanent increase in runoff and pollutant loading. Alternative 2 would increase the impervious area by 0.85 acre and Alternative 3 by 2.87 acre compared to the existing freeway facility.

Construction of the project is subject to the requirements of the California Department of Transportation (Caltrans) NPDES Permit. As part of these requirements, Caltrans must:

1. Consider approved Design Pollution Prevention (DPP) and Treatment Control BMPs for the project site; and
2. Construct DPPs and Treatment BMPs where feasible.

Currently, storm water runoff from SR-91 within the project limits is untreated. As part of the proposed project, Treatment BMPs that target the constituents of concern in the storm water runoff from the project area must be considered. The project would include BMPs that provide treatment for pollutants of concern per Caltrans guidelines.

Where feasible, Design Pollution Prevention and Treatment Control BMPs would be incorporated into the project design. The Treatment Control BMPs would also be used to maximize pollutant treatment. All Treatment Control BMPs would be located outside of California Department of Fish and Game (CDFG) and United States Army Corp of Engineers (ACOE) jurisdictional waters. The siting and decision on the types of Treatment BMPs would be conducted consistent with the Caltrans Stormwater Quality Project Planning and Design Guide. BMPs selected would be based on the targeted constituents and may include any of the following: vegetated strips/swales, detention devices, infiltration devices, media filters, and/or other Caltrans-approved Treatment BMPs. The approved devices have been scientifically tested by Caltrans to ensure that expected pollutant loads from the proposed project would be reduced by implementation of Design Pollution Prevention and Treatment Control BMPs.

The potential for groundwater contamination of the nearby OCWD recharge basins along the Santa Ana River requires that the appropriate spill containment and spill prevention control measures be incorporated into the proposed project. Spill containment and prevention control measures would be implemented in accordance with the processes contained in the statewide Storm Water Management Plan (SWMP) and clearly discussed in the Storm Water Pollution Prevention Plan (SWPPP).

Through compliance with Caltrans statewide NPDES permit and the statewide SWMP (Measure WQ-1) and implementation of Treatment BMPs and Design Pollution Prevention BMPs as stated in Measures WQ-3 (Implement Treatment BMPs) and WQ-4 (Implement Design Pollution Prevention BMPs), construction of the proposed project would not result in adverse impacts to water quality.

#### **2.9.4 Avoidance, Minimization, and/or Mitigation Measures**

Standard water quality regulatory measures that would minimize temporary and permanent impacts are listed below.

**WQ-1** The project will comply with the provisions of the *Department Statewide National Pollutant Discharge Elimination System (NPDES) Permit* (Order No. 99-06 DWQ, NPDES No. CAS00003) and the *NPDES General Permit, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activities* (Order No. 2009-0009-DWQ, NPDES No. CAS000002) and any subsequent permit in effect at the time of construction.

**WQ-2** A Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP will identify the sources of pollutants that may affect the quality of storm water and include the construction site best management practices (BMPs) to control pollutants such as sediment control, catch basin inlet protection, construction materials management, and non-storm water BMPs. All construction site BMPs will follow the latest edition of the *Storm Water Quality Handbooks: Construction Site Best Management Practices Manual* as stated in Section 3.4.2.1 (page 3-6) to control and minimize the impacts of construction-related activities, material, and pollutants on the

watershed. These include, but are not limited to, temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other non-storm water BMPs.

**WQ-3** The California Department of Transportation (Caltrans) approved treatment Best Management Practices (BMPs) will be implemented to the Maximum Extent Practicable (MEP) consistent with the requirements of the National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Stormwater Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Department) Properties, Facilities, and Activities (Order No. 99-06-DWQ, NPDES No. CAS000003) and any subsequent permits. Treatment BMPs may include biofiltration strips/swales, infiltration basins, detention devices, dry weather flow diversion, Gross Solids Removal Devices (GSRDs), media filters, and wet basins.

**WQ-4** Design Pollution Prevention Best Management Practices (BMPs) will be implemented, such as preservation of existing vegetation; slope/surface protection systems (permanent soil stabilization); concentrated flow conveyance systems such as ditches, berms, dikes, swales, overside drains, flared-end sections, and outlet protection/velocity dissipation devices.

**WQ-5** Construction site dewatering must comply with the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (*De Minimus*) Threat to Water Quality (Order No. R8-2009-0003, National Pollutant Discharge Elimination System [NPDES] No. CAG998001), and any subsequent updates to the permit at the time of construction. Dewatering Best Management Practices (BMPs) must be used to control sediment and pollutants, and the discharges must comply with the Waste Discharge Requirements (WDRs) issued by the Santa Ana Regional Water Quality Control Board (RWQCB).

## 2.10 Geology, Soils, Seismic, and Topography

### 2.10.1 Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department’s Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. Surface rupture is the most easily avoided seismic hazard. In that this project is not a construction project for human occupancy this law is not applicable to this project.

The Seismic Hazards Mapping Act (SHMA) of 1990 (Public Resources Code, Chapter 7.8, Section 2690-2699.6) directs the Department of Conservation, California Geological Survey to identify and map areas prone to liquefaction, earthquake-induced landslides and amplified ground shaking. The purpose of the SHMA is to minimize loss of life and property through the identification, evaluation and mitigation of seismic hazards. The SHMA was passed by the legislature following the 1989 Loma Prieta earthquake. Staff geologists in the Seismic Hazard Zonation Program gather existing geological, geophysical and geotechnical data from numerous sources to produce the Seismic Hazard Zone Maps. They integrate and interpret these data regionally in order to evaluate the severity of the seismic hazards and designate as *Zones of Required Investigation (ZORI)* those areas prone to liquefaction and earthquake-induced landslides. Cities and counties are then required to use the Seismic Hazard Zone Maps in their land use planning and building permit processes.

The City of Anaheim's General Plan (May 25, 2004) notes the following policies to minimize the risk to public health and safety and disruptions to vital services, economic vitality and social order resulting from seismic and geological activities:

- 1.) Minimize the risk to life and property through the identification of potentially hazardous areas, adherence to proper construction design criteria, and provision of public information.
- 2.) Require geologic and geotechnical investigations in areas of potential seismic or geologic hazards as part of the environmental and/or development review process for all structures and enforce structural setbacks from faults that are identified through those investigations.
- 3.) Enforce the requirements of the California Seismic Hazards Mapping and Alquist-Priolo Earthquake Fault Zoning Acts when siting, evaluating, and constructing new projects within the City.
- 4.) Require that engineered slopes be designed to resist earthquake-induced failure.
- 5.) Require removal or rehabilitation of hazardous or substandard structures that may collapse in the event of an earthquake.
- 6.) Require that lifelines (water, sewer, electrical, gas facilities, and communication and transportation facilities that are needed in the event of an earthquake, flood, or other natural disaster) crossing a fault be designed to resist the occurrence of fault rupture.
- 7.) Require that new construction and significant alterations to structures located within potential landslide areas be evaluated for site stability, including the potential impact to other properties, during project design and review.

The design and construction of this project will comply with all applicable policies of the City of Anaheim's General Plan's Safety Section addressing geological issues.

### **2.10.2 Affected Environment**

This section is based on the *Final Geotechnical Review Report for SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California* (Final Geotechnical Review Report) prepared by Leighton Consulting (May 2003; revised January 2004) and the *District Preliminary Geotechnical Report for 91 WB*

*From NB SR-55 Connector to Tustin Avenue. OC.* (Preliminary Geotechnical Report) prepared by Department of Transportation, Division of Engineering Services (December 10, 2009), the *Water Quality Assessment Report* (WQAR) prepared by RBF (December 2009), and the City of Anaheim General Plan – Safety Element (May 2004). The Geotechnical Report is on file and available for review at the California Department of Transportation (Department) District 12 Environmental Engineering Branch.

### **2.10.2.1 Regional Geology and Topography**

The project is located within the Los Angeles Basin of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is composed of mountain ranges that are oriented roughly northwest to southeast, and generally parallel the San Andreas Fault. The Los Angeles Basin is an alluvium filled basin that is up to several miles thick at the deepest point. The project is underlain by alluvium derived from the surrounding mountains. The alluvium is composed mostly of medium dense to dense gravelly sands and sands, with a few layers of stiff to very stiff silt and clay. Abutment fills in the area are generally stiff sandy silts.

The alluvial fan deposits beneath the site thicken to about 82 ft in areas north of the Santa Ana River. A review of the Department's logs of test borings that were drilled in 1952 indicated soils were predominantly composed of sand and gravel with minor silt to the depth of approximately 49.2 ft. The Department's borings that were drilled in 1963 near the State Route 91 (SR-91)/Tustin Avenue interchange encountered interbedded layers of sand, gravel, and silt, again to a depth of 49.2 ft.<sup>1</sup>

According to the WQAR, SR-91 varies in elevation within the project limits, generally decreasing in elevation from the east to the west along the westbound lanes. At the eastern terminus, the project is approximately 309 ft above mean sea level (amsl), and at the Santa Ana River overcrossing, the bridge is between 257 and 256 ft amsl. The project is approximately 235 ft amsl at the western terminus.

### **2.10.2.2 Soil Conditions**

The site is underlain by alluvium consisting of sand and gravels with occasional clay layers between the Riverdale overcrossing (OC) and the SR-91/SR-55 Separation.

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<sup>1</sup> Final Geotechnical Report for SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California. Leighton Consulting, May 28, 2003 (Revised January 20, 2004).

Soil consistencies range from loose to medium dense within the upper 25 feet (ft), and become dense to very dense at depths of 25 to 35 feet below ground surface (bgs).

Based on Cone Penetrometer (CPT) investigation conducted in November and December, 2009, the artificial fills are mostly composed of stiff to very stiff sandy silts and silts. There is a layer of approximately 6 to 8 ft of medium dense to dense sands at the top of the fills at the Riverdale OC and Tustin OC. The underlying native soils east of the Riverdale OC consist of clayey silts and silts underlain by dense sands and gravels. The underlying soils to the west of the Riverdale OC do not exhibit the clayey silt layers. The native soil is only composed of medium dense to very dense sand and gravel mixtures.

### **2.10.2.3 Subsurface and Groundwater Conditions**

Out of the five historical geotechnical investigations conducted by the Department between 1962 and 1973, three geotechnical investigations have encountered groundwater between 200 and 232 ft. The closest Department of Water Resources ground water well data shows a historic high ground water elevation at 232.2 ft.

Historic records show that the shallow groundwater at the project site can be as close as 9.8 ft bgs, decreasing to approximately 29 ft bgs near the south end of the Peralta Hills. The groundwater levels may vary since the site is adjacent to percolation basins maintained by the Orange County Water District (OCWD) or for recharging the groundwater basin. Variations in groundwater depth can be caused by changes to groundwater pumping, irrigation, seasonal rainfall, climatic variations, and use of the basins for recharge.<sup>1</sup>

### **2.10.2.4 Corrosion**

A corrosive environment is defined as being a site where the soil has electrochemical resistivity of less than 1,000 ohm-centimeters, or a sulfate content greater than 2,000 parts per million (ppm), or chloride content greater than 500 ppm, or a percentage of hydrogen (pH) of less than 5.5. According to the Final Geotechnical Report, the alluvial soils underlying the site are considered noncorrosive while fine-grained soils

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<sup>1</sup> Final Geotechnical Report for SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California. Leighton Consulting, May 28, 2003 (Revised January 20, 2004).

located within or comprising fills in the area of the Tustin Avenue overcrossing abutment embankments and off-ramp are considered corrosive.

Based on findings of previous investigations, subsurface soils beneath the original grades at the site consist predominately of granular soils such as sands and gravels, which are typically not corrosive, but there were a few layers of clay and silt encountered. Therefore, soil samples must be collected during the geotechnical investigation for corrosion testing.

### **2.10.2.5 Regional Faulting and Seismicity** ***Seismic Shaking***

The project is located in a seismically active area, and the geologic processes that have caused earthquakes in the past are expected to continue. A fault is considered active by the State of California if geologic evidence indicates that movement on the fault has occurred in the last 11,000 years, and potentially active if movement is demonstrated to have occurred in the last 2 million years. According to the Final Geotechnical Report, the El Modeno-Peralta Hills fault, which is the closest active fault to the proposed project as well as the controlling fault for the project area, is located 0.62 mile (mi) from the project site. No fault zones pursuant to the Alquist-Priolo Earthquake Fault Zoning Act (APEFZA) are located within the City of Anaheim. The closest APEFZA fault is the northwest-southeast-trending Whittier-Elsinore Fault Zone, which is located 6.2 mi from the project limits. Therefore, the possibility of ground surface rupture at the project site is remote.

According to the Preliminary Geotechnical Report the peak bedrock acceleration at the site is estimated to be 0.50 g. The contributing faults to this peak horizontal acceleration are the El Modeno-Peralta Hills and the Whittier-Elsinore Fault Zones with Caltrans associated magnitudes of 6.5 and 7.5, respectively.<sup>1</sup>

According to the Preliminary Geotechnical Report, the potential locations of the retaining walls proposed for the project are not located within an “Earthquake Fault Zone” as delineated by the California Geological Survey (CGS).

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<sup>1</sup> Final Geotechnical Report for SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California. Leighton Consulting, May 28, 2003 (Revised January 20, 2004).

Design features will be included specifically to address the potential effects of seismic shaking on the project structures such as retaining walls.

### ***Surface Fault Rupture***

Surface fault rupture is defined as displacement that occurs at the surface along the trace of a fault. Potentially active faults that are in close proximity to the City of Anaheim include the El Modeno-Peralta Hills fault. However, the El Modeno-Peralta Hills fault has a low potential for ground rupture within the City. In addition, the California Department of Mines and Geology (CDMG) has determined that the El Modeno-Peralta Hills fault is not “sufficiently active” or “well defined” enough to be subject to the provisions of the APEFZA.

Since the project site is not located in an Alquist-Priolo Earthquake Fault Zone,<sup>1</sup> no active faults cross the site or extend toward the site, and the nearest known active faults are located at a distance of approximately 0.62 mi from the project site. Therefore, there is a low likelihood of direct surface fault rupture at the project site.

### ***Liquefaction***

Liquefaction is a phenomenon in which loose, saturated fine-grained, granular soils behave like a liquid while being subjected to high-intensity ground shaking. Liquefaction occurs when shallow groundwater, low-density, fine, sandy soils and high-intensity ground motion exist on a site.

Most of the retaining walls are located in an area marked as a risk for liquefaction on the State of California Seismic Hazard Zones map for the Orange Quadrangle (CGS, 1998). However, given the relatively high N-value correlated results from CPT soundings coupled with rotary boring results, the encountered soils beneath the groundwater level encountered at the time do not appear susceptible to liquefaction.

Liquefaction-induced ground failure has historically been a major cause of earthquake damage in Southern California. The State of California Seismic Hazard Zone map for the Orange Quadrangle (April 15, 1998) indicates historical instances of liquefaction along SR-91 that have occurred within the project limits. However, based on the results of the CPT soundings coupled with the rotary soil boring results, the soils encountered beneath the groundwater level do not appear to be susceptible to

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<sup>1</sup> California Geological Survey Division of Mines and Geology, Earthquake Fault Zone Map 4E, May 1, 1999.

liquefaction. A site-specific liquefaction analysis must be completed during the design phase of this project to assess in detail the liquefaction potential of the site.

Groundwater table levels indicate that the potential for liquefaction-induced lateral spreading is considered low.<sup>1</sup> However, the potential for lateral spreading will increase if the groundwater table rises and saturates shallow alluvial layers.

### ***Tsunami/Seiches/Dam Inundation Potential***

A tsunami is defined as a gravitational sea wave produced by any large-scale disturbance of the seafloor. The Pacific Ocean is located approximately 16.5 mi from the western boundaries of the project limits, and the approximate surface elevation at the project site ranges from approximately 230 ft amsl in the eastern end of the project limits to 318 ft amsl at the western end of the project limits.

A seiche is a free or standing wave oscillation of the water surface of an enclosed body of water that may consist of a lake, reservoir, or harbor. Although the closest body of water is the Santa Ana River, which traverses the project limits in a north-south direction, the closest operational reservoir is the Walnut Canyon Reservoir, which is located approximately 4.06 mi southeast of the eastern project limits. Based on the distance of the Walnut Canyon Reservoir from the project site, the chance of a seiche affecting the areas within the project limits during a seismic event is considered remote.

According to Figure S-7 of the City of Anaheim General Plan, the project is located within the general limits of a flood impact zone of the Prado Dam. In addition, areas located immediately north of State Route 55 (SR-55) and generally west of the Tustin Avenue interchange, are located in the general limits of the flood impact zone of the Carbon Canyon Dam.

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<sup>1</sup> Final Geotechnical Report for SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California. Leighton Consulting, May 28, 2003 (Revised January 20, 2004).

### **2.10.2.6 Landslide and Slope Instability**

Landslides result from the downward movement of earth or rock materials that have been influenced by gravity. Landslides usually occur due to factors such as steep slope conditions, erosion, rainfall, groundwater, adverse geologic structure, and grading impacts. Landslide deposits usually consist of shallow surficial soil slumps, mudflows, and debris flows deposited within the near-surface topsoils.

According to the State of California Seismic Hazard Zone map for the Orange Quadrangle (April 15, 1998), areas located immediately east-southeast of the SR-55/SR-91 interchange and south of Nohl Canyon Road, are shown as areas that have had previous earthquake-induced landslides, or areas where local topographic, geological, geotechnical, and subsurface water conditions have indicated a potential for permanent ground displacements. Areas of earthquake-induced landslides would require mitigation as defined in the Public Resources Code Section 2693(c).

The potential for earthquake-induced settlements are high if soils above the elevation of 213.3 ft amsl become saturated. However, the potential for earthquake-induced settlement of unsaturated soils is less than 1 inch.<sup>1</sup>

### **2.10.3 Environmental Consequences**

#### **2.10.3.1 Temporary Impacts**

##### ***No Build Alternative***

The No Build Alternative does not involve construction activities and would not alter existing geologic or soil conditions; therefore, there will be no effects on existing natural landmarks, landforms, geological or soil resources.

##### ***Build Alternatives 2 and 3***

The project is expected to have a minimal impact on geologic and topographic conditions. However, temporary impacts related to construction activities would occur. Build Alternatives 2 and 3 would alter existing topography due to grading and construction of cut-and-fill slopes within the project limits. Given that the proposed project is anticipated to widen an already existing multilane highway, the potential topographic impacts are considered less than significant.

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<sup>1</sup> Final Geotechnical Report for SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California. Leighton Consulting, May 28, 2003 (Revised January 20, 2004).

Temporary erosion effects could occur due to project construction. These effects are discussed in Section 2.9, Water Quality and Storm Water Runoff. The Build Alternatives would not increase exposure to geologic hazards such as erosion. Erosion control measures that are discussed in Section 2.9 would minimize the temporary increase in erosion as a result of construction. As discussed in Section 2.9, with implementation of erosion control best management practices (BMPs) in the Storm Water Pollution Prevention Plan (SWPPP), potential erosion impacts are considered less than significant.

The exposure risk to workers resulting from earthquake and or liquefaction occurring within the project area during construction is negligible. Additionally, there is no substantial soil erosion or geological hazards within the project limits that will expose workers to risk during normal construction activities. In that there are no natural landmarks or landforms within the project limits, the project will have no temporary impacts on the visual quality of natural landmarks and landforms.

### **2.10.3.2 Permanent Impacts**

#### ***No Build Alternative***

The No Build Alternative does not alter the existing facility and would not increase exposure to geologic hazards such as erosion and earthquakes. However, the proposed project is located in an area that may be subject to liquefaction, with or without implementation of the proposed project, that could result in damage to the existing facility during a major seismic event. Therefore, the No Build Alternative will have a less than significant impact on geology, soil, seismic hazards, and topography. The No Build Alternative will have no permanent impacts on the visual quality of natural landmarks and landforms.

#### ***Build Alternatives 2 and 3***

Build Alternatives 2 and 3 are expected to have a minimal impact on geologic and topographic conditions. The primary geologic and geotechnical constraints affecting the design and construction of the Build Alternatives include:

- Seismic Hazards
- Liquefaction and Landslides
- Erosion
- Corrosion

### *Seismic Hazards*

Build Alternatives 2 and 3 would not increase exposure to geologic hazards such as tsunamis due to the distance of the project site from the coastline. Although, the area may be prone to such geological hazards such as seiches and dam inundation, these geological hazards would exist with or without the proposed project.

As discussed previously, the Santa Ana River is located within the project limits. However, the climate is generally dry in Southern California, and with Prado Dam controlling the existing water flow, very little water flows within the Santa Ana River throughout the year. In addition, the closest significant historical earthquake to this site was recorded on December 16, 1858.<sup>1</sup> Therefore, due to the limited volume of water generally present within the Santa Ana River and the fact that the last significant earthquake recorded occurred approximately 150 years ago, the potential for a seiche is remote. The closest active reservoir is the Walnut Canyon Reservoir, located approximately 4.06 mi southeast of the eastern project limits. Based on the distance away from the project limits, a potential impact as a result of a seiche is considered less than significant.

As discussed earlier in this section, the proposed project is also located in the Prado Dam flood impact zone. Flood inundation as a result of dam failure is considered a potential hazard to the proposed project. However, impacts are not considered greater than existing conditions. Department and County Emergency Response Plans currently in place would continue to address the same impacts after the construction of the proposed project. Therefore, impacts associated with Prado Dam inundation are less than significant.

The proposed project is not located within an APEFZA area. No known fault crosses or extends toward the project site. The nearest known faults are located approximately 0.62 mi from the site. According to the City of Anaheim's General Plan, the nearest contributing fault is considered to have a low potential for surface rupture. Although the potential for a surface fault rupture hazard at the site due to primary movement along a known fault is considered low, the Department is considering the possibility of seismic activity and therefore is including standard design features to minimize and avoid potential adverse impacts from seismic events.

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<sup>1</sup> Final Geotechnical Report For SR-91 Improvements Between SR-55 and Tustin Avenue Interchange, Anaheim, California. Leighton Consulting, May 28, 2003 (Revised January 20, 2004).

Therefore, the potential impact from surface fault rupture within the project limits is considered less than significant.

### *Liquefaction and Landslides*

The project is located in an area that may be subject to liquefaction. Although there are no areas located within the project limits that are susceptible to seismically induced landslides, an area located adjacent to the eastern side of the SR-55/SR-91 interchange is an area where seismically induced landslides may potentially occur.

Additional field investigation in the form of a Final Geotechnical Design Report (GDR) will be conducted during final design to evaluate the existing groundwater levels along the project site, and the potential extent of liquefaction, earthquake-induced settlements, the presence and/or absence of expansive soils, and lateral spreading in the area. In addition, the proposed tieback walls will be evaluated in the Final Foundation Report (FR). The Final GDR and FFR will also provide detailed analyses for the various design features. Based on the results of the Final GDR and Final FR, the project design will include deepening the foundation and/or increasing the depth of piles or other suitable remedies. In addition, fill slopes will be stabilized by utilizing the 1 vertical to 2 horizontal (1v:2h) slope, assuming no liquefaction and lateral spreading. With implementation of the recommendations of the Final GDR and Final FR, potential seismic impacts associated with Build Alternatives 2 and 3 are considered less than significant. Additionally, the exposure to liquefaction and landslides to the traveling public upon the completed improvements would be unlikely.

### *Erosion*

Permanent erosion impacts can possibly occur from cut slopes. Loose sediment from these slopes may be carried to drainages and streams during a rain event or strong winds. Vegetating the slopes and implementation of permanent BMPs (outlined in Section 2.9, Water Quality) would greatly reduce the amount of erosion and siltation. In addition, the natural slopes within the project site are covered with material that is granular in nature (i.e., sand and gravel). Slopes are typically covered with vegetation. Where cuts are proposed, the slope faces will be protected and held in place by retaining walls. Considering that the area impacted is limited and the measures have been incorporated into the project design, potential long-term erosion impacts, including any hazards to the traveling public upon the completed improvements, would be less than significant.

### *Corrosion*

As discussed previously, alluvial soils underlying the site are considered noncorrosive while fine-grained soils located within or comprising the fills in the area of the Tustin Avenue overcrossing abutment embankments and off-ramp are considered corrosive. Corrosion potential will be verified by field sampling and laboratory testing, and the results will be provided in the Final GDR. With implementation of the recommendations of the Final GDR, potential corrosion impacts associated with Build Alternatives 2 and 3 are considered less than significant.

### **2.10.4 Avoidance, Minimization, and/or Mitigation Measures**

The following minimization measures would minimize potential geological, seismic, and soil impacts.

- GEO-1** During final design, a Final Geotechnical Design Report (GDR) and a Final Foundation Report (FFR) shall be prepared for the project. As part of the GDR and FFR, a minimum of 20 soil borings shall be drilled at the site in order to provide needed design parameters for the proposed Type 1 walls and tieback retaining walls. The GDR will evaluate the potential for the construction of standard retaining walls, and the FFR will evaluate the potential for the tieback retaining walls. Parameters such as bearing Capacity, settlement, liquefaction, corrosion, seismic parameters, expansive soils, and construction considerations can be addressed in the Final GDR and FFR based on field and laboratory findings. The recommendations of the Final GDR and Final FR shall be incorporated into the final design of the project. Since liquefaction is a factor in certain areas within the project limits, the project shall incorporate deepened foundations and/or increased depth of piles as needed.
- GEO-2** During final design, project design will address corrosion-resistant design for construction. The Final Geotechnical Design Report (GDR) will determine the type of metal or type of concrete mix that will be resistant to corrosion.
- GEO-3** Prior to construction, the limits of proposed soil removals shall be evaluated due to limited soil removal and recompaction that may occur on native soils located beneath the Type 1 walls. All exposed native soil shall then be inspected and approved by the Resident Engineer

(RE). In addition, all soft soil areas shall be stabilized prior to the construction of the retaining walls.

**GEO-4** During final design, exposed soil on which the foundations for proposed retaining walls will be placed will be surface compacted to 95 percent. The foundations shall also be inspected and approved by a geotechnical representative from the Department, District 12. If encountered during construction activities, all soft soils that are not suitable for placement of foundations should be removed to a competent base, moisture-conditioned, and recompacted to 95 percent relative compaction prior to construction.

**GEO-5** Prior to construction, all areas to receive fill should be cleared and grubbed of vegetation and trash. The clearing and grubbing should be in accordance with Section 16 of the latest Caltrans Standard Specifications edition. The import soil shall consist of granular, free-draining material with an Expansion Index of less than 50 and/or a Sand Equivalent of 20 or more. The fill should be benched into the existing slopes per Section 19-6.01, "Placement," of the latest Standard Specifications edition. Structural backfill that will be placed behind the retaining walls shall conform to Section 19, "Earthwork," of the latest Caltrans Standard Specifications edition. Similar grading procedures apply to fill placed along State Route 91 (SR-91) at the Tustin Avenue off-ramps.

**GEO-6** All existing utilities located beneath the proposed retaining walls shall be properly identified prior to the start of construction activities.

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## 2.11 Paleontology

### 2.11.1 Regulatory Setting

Paleontology is the study of life in past geologic time based on fossil plants and animals. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized or funded projects (e.g., Antiquities Act of 1906 [16 United States Code (USC) 431-433]; Federal-Aid Highway Act of 1935 [20 USC 78]). Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA); the California Code of Regulations, Title 14, Division 3, Chapter 1, Sections 4307 and 4309; and Public Resources Code Section 5097.5.

### 2.11.2 Affected Environment

*A Paleontology Identification Report/Paleontological Evaluation Report (PIR/PER)* for the SR-91 Westbound Widening from the Northbound (NB) SR-55 through the WB SR-91 connector to the Tustin Avenue was prepared in January 2010. This report was prepared to meet the California Department of Transportation (Caltrans) current Paleontological Guidelines as outlined in Volume 1, Chapter 8, of the Standard Environmental Reference (SER). A summary of this report is provided below.

The Area of Direct Impact (ADI) covers all areas to be disturbed by construction of the proposed project, including areas for staging and access and temporary construction signage. To ensure that research was comprehensive, the paleontological resources “study area” was expanded to a 300 foot (ft) radius beyond the ADI of Alternative 3, the maximum project footprint.

Prior to the field survey, research was conducted to locate fossil localities both within the project area and in an area much larger than the study area. Research focused on locating sediments and formations conducive to the preservation of paleontological resources, including review of available geological and paleontological literature concerning or related to the formations that are likely to be encountered during excavation for this project and requests for paleontological locality data from southern California museums in the vicinity of the project.

The surface of the project area contains three types of sediments comprised of two types of native alluvium from the late Pleistocene to Holocene and artificial (engineered) fill. Within the subsurface, sediments from the middle to late Pleistocene may also be encountered. The surficial sediments do not have the potential to contain

fossils. However, middle to late Pleistocene sediments in the subsurface do have the potential to contain significant nonrenewable paleontological resources and may be encountered if excavation extends deeper than approximately 8 ft below existing ground surface (bgs). Recommendations from CEQA, and guidelines from Caltrans and the County of Orange are consistent with recommendations of the Society of Vertebrate Paleontology (SVP) and indicate that impacts to nonrenewable paleontological resources must be considered during project design and construction within sensitive sediments.

### **2.11.3 Environmental Consequences**

#### **2.11.3.1 Temporary Impacts**

##### ***No Build Alternative***

Since the No Build Alternative does not involve any construction and there would be no excavation activities, there is no potential for encountering paleontological resources.

##### ***Build Alternatives 2 and 3***

No temporary impacts would occur during construction activities for Build Alternatives 2 and 3 with implementation of the Paleontological Mitigation Plan (PMP). Any impacts to paleontological resources during construction of Build Alternatives 2 and 3 are considered permanent impacts and are discussed under Permanent Impacts.

#### **2.11.3.2 Permanent Impacts**

##### ***No Build Alternative***

Since the No Build Alternative does not involve construction and there would be no excavation activities, there is no potential for encountering paleontological resources, and there will be no permanent impacts.

##### ***Build Alternative***

The literature review and records search through museums produced information indicating that sediments dating from the Pleistocene period located within the project limits have the potential to contain significant nonrenewable paleontological resources. Thus, it is likely that additional localities would be encountered during excavation of 8 ft bgs or more within Pleistocene sediments. The field survey confirmed that sediments exposed on the surface of the project are composed of recent alluvium and artificial fill, both of which have a low sensitivity for paleontological resources.

Within the ADI, project plans call for excavation that may extend up to 10 ft bgs. The proposed project would include excavation for the following: widening the roadway; surface street improvements; overexcavation to reach competent soil, storm drain, and utility trenches; and wall footings. Pile driving for widening existing bridge structures would be to a maximum depth of 60 ft, but these activities affect a small area and usually have minimal impact. Since the study area includes areas with exposures of native sediments as well as artificial fill, this report addresses the potential for impacts to all sediments, native or artificial.

The excavation depths shown on the project plans are as follows:

- Road Bed: Approximately 4 ft
- Storm Drains (assuming a 48-inch pipe): Approximately 6 ft deep
- Utilities (both new and relocated): Depends on the utility, but the maximum depth would not exceed 10 ft
- Wall Footings: Maximum depth of approximately 8 ft

Thus, as the project is currently designed, the only areas that will require monitoring will be where utilities extend deeper than 8 ft, and possibly at the wall footings if they approach the depth of 8 ft bgs.

#### **2.11.4 Avoidance, Minimization, and/or Mitigation Measures**

All vertebrate fossils are paleontologically significant, and there is a potential to excavate into geologic units and formations that contain these paleontologically significant remains. As the proposed project involves excavating into these units and formations, there is no way to avoid excavation into potentially sensitive sediments.

Implementation of the following measure would minimize potential effects to unknown paleontological resources.

- PAL-1** Prior to the completion of Plans Specifications and Engineering (PS&E), in accordance with the guidelines on the California Department of Transportation Standard Environmental Reference (SER), Volume I, Chapter 8, a Paleontological Mitigation Plan (PMP) will be prepared by a qualified paleontologist for inclusion in the PS&E and implemented during the construction phase of the project. The PMP should generally discuss the level of sensitivity of formations encountered along the project alignment; monitoring methods for areas identified as likely to contain paleontological

resources; salvage methods and procedures; resource collection, processing, identification, documentation, and curation activities and procedures; and discuss the required preparation of a Paleontological Monitoring Report (PMR) at the conclusion of the project that follows the Department SER Volume I, Chapter 8 guidelines. The PMP will include, but not be limited to, the following steps:

1. A qualified paleontologist or his/her representative will attend the pregrade meeting. At this meeting the paleontologist will explain the likelihood for encountering paleontological resources, what resources may be discovered, and the methods that will be employed if anything is discovered (see below).
2. All employees, subcontractors, and Contractor's representatives on site involved in subsurface-disturbing activities must receive a 1-hour paleontological resource awareness training program provided by the Paleontological Salvage Team prior to performing on-site work.
3. During construction excavation, a qualified vertebrate paleontologic monitor shall initially be present on a full-time basis whenever excavation will occur within the sediments that have a high sensitivity rating and on a spot-check basis in sediments that have a low sensitivity rating. Monitoring may be reduced to a part-time basis if no resources are being discovered in sediments with a high sensitivity rating (monitoring reductions and when they occur will be determined by the qualified Principal Paleontologist). The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. The monitor shall be empowered to temporarily divert construction equipment away from the immediate area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, Caltrans shall consider using heavy equipment on site to assist in the removal and collection of large materials.
4. Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, it is recommended that these native sediments occasionally be spot-screened through one-eighth to one-twentieth-inch mesh screens to determine whether

microfossils are present. If microfossils are encountered, additional sediment samples (up to 3 cubic yards, or 6,000 pounds) shall be collected and processed through one-twentieth-inch mesh screens to recover additional fossils.

5. Any recovered specimens shall be prepared to the point of identification and permanent preservation. This includes the picking of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens.
6. Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university that has a curator who can retrieve the specimens on request. Caltrans requires that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.
7. A PMR shall be prepared with an appended, itemized inventory of specimens. When submitted to the Lead Agency, the report and inventory would signify completion of the program to mitigate impacts to paleontological resources. The report should also be submitted to the museum repository along with the fossil specimens.

The above-listed measures are standard Caltrans minimization measures for projects that have the potential to encounter sensitive sediments. During the development of the PMP, additional measures may be added; this list is only meant to provide a summary of what may be involved, as additional documentation is often needed on projects that involve Caltrans.

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## 2.12 Hazardous Wastes and Materials

This section is based on the Phase I Environmental Site Assessment Report (Phase I) (January 2004) and the Phase I Environmental Site Assessment Update Memorandum (Phase I Update) (May 2010).

### 2.12.1 Regulatory Setting

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

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

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 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 handling of hazardous material is vital if it is disturbed during project construction.

### 2.12.2 Affected Environment

The Phase I (January 2004) was conducted to determine whether the proposed project area could be impacted by hazardous waste. Due to the passage of time, a Phase I Update Memorandum (May 2010) was prepared to update the Phase I. A search of government records was conducted to obtain a listing of properties or known incidents from state or federal databases for hazardous waste sites to identify any potential for the existence of contamination within the project area.

The search of federal, state, and local regulatory agency databases identified a total of 3 site locations with documented hazardous releases located within a ¼-mile (mi) radius of the project site. These three hazardous release site locations consist of two site locations that were listed as leaking underground storage tank (LUST) facilities, and one site location that was listed as a LUST facility, a State-listed facility, a Federal Resource Conservation Recovery Act (RCRA) Corrective Action (RCRACOR) facility, an RCRA facility. Based on a review of the databases for these three sites, it is unlikely that these sites would impact the project during construction. These three site locations with known hazardous releases are summarized in Table 2.12.1 and depicted in Figure 2.12-1.

**Table 2.12.1 Offsite Hazardous Waste Release Locations**

Figure 2-12-1 No.	Subject Site and Address Distance from Subject Site	Distance from Project Area	Database
1	Arciero and Sons, Inc./Sand and Sea Toyz, Inc. 950 N. Tustin Avenue Anaheim, CA 92807	approx 0.01 mile northeast of the project limits	RCRA GEN PERMITS LUST
2	Arco 6079 3901 E. Riverdale Avenue Anaheim, CA 92807	approx 0.12 mile southwest of the project limits	LUST
3	General Electric Apparatus Service Center 3601 East La Palma Avenue Anaheim, CA 92806	approx 0.23 mi northwest of the project limits	LUST State Other Permit RCRA GEN RCRA RCRA COR

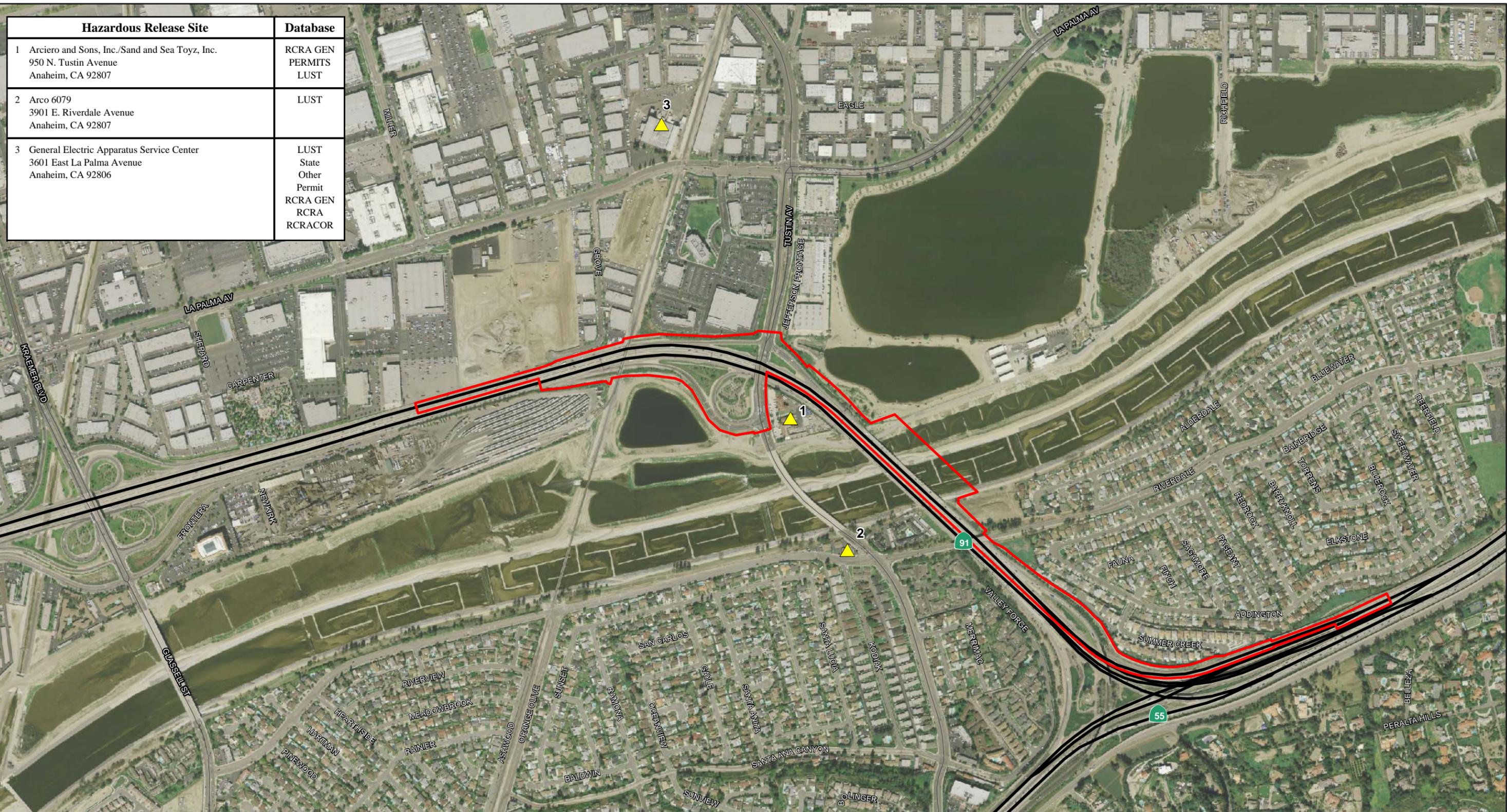
Source: FirstSearch Environmental Database Report (January 14, 2010).

Permit = Permitted Site

Other = Other classified State sites

RCRA COR = Resource Conservation and Recovery Act Corrective Action Sites

RCRA GEN = Resource Conservation and Recovery Act Generators



Hazardous Release Site	Database
1 Arciero and Sons, Inc./Sand and Sea Toyz, Inc. 950 N. Tustin Avenue Anaheim, CA 92807	RCRA GEN PERMITS LUST
2 Arco 6079 3901 E. Riverdale Avenue Anaheim, CA 92807	LUST
3 General Electric Apparatus Service Center 3601 East La Palma Avenue Anaheim, CA 92806	LUST State Other Permit RCRA GEN RCRA RCRACOR

LEGEND

- Project Area
- ▲ Hazardous Release Sites

Note: the hazardous release sites on Figure 2 are based on available information provided in the FirstSearch Database Report. Most of the sites on the figure were identified by address. However, the location of Site 9 is based on approximate intersection information because no address was available. Therefore, there is no way of identifying the exact location of the release for this site.

FIGURE 2.12-1



SOURCE: Air Photo USA (2008); TBM (2008); LSA (2010)

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Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction

Hazardous Release Sites of Potential Concern

12-ORA-91 PM 7.9/9.5

Project ID No. 120000078 (EA# 0C5600)

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The Phase I revealed no evidence of recognized environmental conditions involving hazardous waste on or immediately adjacent to the project site except for the following:

- **Yellow Paint and Tape used for Pavement Marking:** Yellow paint traffic stripes used prior to 1997 may exceed the hazardous waste criteria under Title 22, California Code of Regulations (CCR), and require the disposal in a Class I disposal facility authorized to accept this type of waste.
- **Aerially Deposited Lead (ADL):** As a result of the former use of lead additives in gasoline, the unpaved areas adjacent to the project limits have the potential for elevated lead levels in surface soils.
- **Asbestos-Containing Materials (ACMs):** There is potential for ACMs to have been used in bridges such as mastic on styrofoam, expansion joint compound, and pipe insulation.

## **2.12.3 Environmental Consequences**

### **2.12.3.1 Temporary Impacts**

#### ***No Build Alternative***

The No Build Alternative does not involve ground or structure disturbance; therefore, no temporary impacts related to hazardous waste would occur.

#### ***Alternatives 2 and 3***

During the construction of Build Alternatives 2 and 3, ACMs may be encountered in roadway structure materials that will be disturbed or demolished. In addition, typical hazardous materials used during construction include solvents, paints, and fuels. However, hazardous materials used during construction would be handled in accordance with standard federal, state, and local regulatory procedures. There are standard regulations and Department policies (avoidance and minimization measures) that must be followed with respect to handling and disposal of potentially hazardous materials during construction of the Build Alternatives to protect human health and the environment.

### **2.12.3.2 Permanent Impacts**

#### ***No Build Alternative***

The No Build Alternative would not change the existing physical environment; therefore, no permanent impacts would occur. Routine maintenance activities would continue and would be required to follow applicable regulations with respect to handling and disposal of potentially hazardous materials.

### **Alternatives 2 and 3**

Like the No Build Alternative, routine maintenance activities would be required to follow applicable regulations with respect to handling and disposal of potentially hazardous materials. Operation and maintenance of the facilities proposed as part of the Build Alternative would not introduce new sources of hazardous materials/waste but rather would continue existing exposure to transport of hazardous materials/waste associated with vehicles currently utilizing SR-91. No new permanent hazardous materials/waste impacts (direct or indirect) related to hazardous materials are anticipated beyond existing conditions.

#### **2.12.4 Avoidance, Minimization, and/or Mitigation Measures**

The avoidance measures below would avoid potential impacts related to hazardous materials and hazardous wastes encountered during construction of both Build Alternatives 2 and 3.

- HW-1** Areas of exposed soils within the Department's right-of-way, which will be disturbed during excavation/grading activities, shall be collected, tested, and analyzed for lead during the design stage after roadway geometric plans have been approved. If lead is found at levels considered hazardous, handling of the impacted soil would be addressed to be consistent with State and federal regulations.
- HW-2** Yellow thermoplastic traffic stripes and pavement markings are typically removed using sand or air blasting equipment prior to construction. Workers are required to adhere to Occupational Safety and Health Act (OSHA) standards, which describe necessary personal safety equipment and work procedures. All yellow paint debris shall require proper containment during and after removal and will be properly handled. After blasting, the blasted material shall be collected and disposed of at an appropriate hazardous materials facility. If the yellow paint debris shall be found to contain lead and chromium at actionable levels, the debris will be disposed of in a Class I landfill.
- HW-3** During the design phase, presumed asbestos-containing (PAC) materials, including rails, bearing pads, support piers, expansion joint material of bridges, asphalt, and concrete will be surveyed and assessed in compliance with 40 Code of Federal Regulations (CFR) 763. If the extent of improvement to any of the existing bridges within

the project site required significant modification or demolition of any part of the bridge components, then pursuant to South Coast Air Quality Management District (SCAQMD) regulations, an asbestos survey shall be conducted by an Asbestos Hazard Emergency Response Act (AHERA) and California Occupational Safety and Health Act (Cal OSHA) certified building inspector to determine the levels of asbestos in structures (including bridge structures) that will be renovated or demolished as part of this project. SCAQMD Rule 1403 (Asbestos Emissions From Demolition/Renovation Activities) shall be implemented for any demolition or renovation work involving asbestos-containing materials.

- HW-4** If unknown wastes or suspect materials are discovered during construction by the contractor, all excavation activities in the immediate vicinity of the area of concern shall be suspended. The Department, in conjunction with other appropriate agencies, shall develop a plan to investigate suspect materials and determine what corrective measures, if any, may be required to safeguard public health and the environment.

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## 2.13 Air Quality

The analysis of the potential air quality impacts of the proposed project is based on the Air Quality Analysis (LSA, February 2010).

### 2.13.1 Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws 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 (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), lead (Pb), and sulfur dioxide (SO<sub>2</sub>). PM includes particulate matter less than 2.5 microns in size (PM<sub>2.5</sub>) and particulate matter less than 10 microns in size (PM<sub>10</sub>).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support 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. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for CO, NO<sub>2</sub>, O<sub>3</sub>, PM. California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Southern California Association of Governments [SCAG] for Orange County) and the appropriate federal agencies (such as the Federal Highway Administration), make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

## **2.13.2 Affected Environment**

### **2.13.2.1 Climate**

The project site is located in Orange County, an area within the South Coast Air Basin (Basin) that includes Orange County and the nondesert parts of Los Angeles, Riverside, and San Bernardino Counties. Air quality regulation in the Basin is administered by the South Coast Air Quality Management District (SCAQMD), a regional agency created for the Basin.

The Basin climate is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills. The Pacific Ocean forms the southwestern boundary, and high mountains surround the rest of the Basin. The region lies in the semipermanent high-pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. This climatological pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, and Santa Ana wind conditions do occur.

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s degrees Fahrenheit (F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site monitoring temperature is the Yorba Linda Station.<sup>1</sup> The annual average maximum temperature recorded at this station is 77.0°F, and the annual average minimum is 49.7°F. January is typically the coldest month in this area of the Basin.

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the Yorba Linda Station. Average rainfall measured at this station varied from 3.10 inches in February to 0.31 inches or less between May and September, with an average annual total of 14.40 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the

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<sup>1</sup> Western Regional Climatic Center. 2009. <http://www.wrcc.dri.edu> (accessed October 5, 2009).

vertical dispersion of air contaminants, holding them relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed from midafternoon to late afternoon on hot summer days, when the smog appears to clear up suddenly. Winter inversions frequently break by midmorning.

Inversion layers are significant in determining O<sub>3</sub> formation. O<sub>3</sub> and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as CO. PM<sub>10</sub> is both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, when heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest concentration of pollutants. On days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are CO and oxides of nitrogen (NO<sub>x</sub>) because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NO<sub>x</sub> to form photochemical smog.

### **2.13.2.2 Regional Air Quality**

The Basin is characterized as having a "Mediterranean" climate (a semi-arid environment with mild winters, warm summers and moderate rainfall). The Basin is a 6,600-square-mile area bound by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes

all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area of Riverside County. Its terrain and geographical location determine the distinctive climate of the Basin, as the Basin is a coastal plain with connecting broad valleys and low hills.

The general region lies in the semi-permanent, high-pressure zone of the eastern Pacific. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as human made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

### **2.13.2.3 Local Air Quality**

The primary federal and state ambient air quality standards for pollutants are shown in Table 2.13.1. The project site is located within SCAQMD jurisdiction. The SCAQMD maintains ambient air quality monitoring stations throughout the Basin. The closest monitoring station is located at 1630 West Pampas Lane, Anaheim, California. As it is not monitored at the Anaheim Station, the SO<sub>2</sub> data were measured at the Costa Mesa Station. The air quality trends at these stations are representative of the ambient air quality in the project area.

Air quality trends identified from data collected at both air quality monitoring stations between 2006 and 2008 are listed in Table 2.13.2 and are discussed below. The ambient air quality data in Table 2.13.2 show that NO<sub>2</sub>, SO<sub>2</sub>, and CO levels are below the relevant State and federal standards. The State 1-hour O<sub>3</sub> standard was exceeded two to six times per year in the last 3 years. The federal 8-hour O<sub>3</sub> standard was exceeded one to five times per year in the last 3 years. The State 24-hour PM<sub>10</sub> standard was exceeded three to seven times per year in the last 3 years. The federal 24-hour standard was exceeded once in 2007. The federal PM<sub>2.5</sub> standard was exceeded 2 to 14 times per year in the last 3 years.

**Table 2.13.1 National and California Ambient Air Quality Standards**

Pollutant	Averaging Time	California Standards <sup>1</sup>		Federal Standards <sup>2</sup>		
		Concentration <sup>3</sup>	Method <sup>4</sup>	Primary <sup>2,5</sup>	Secondary <sup>3,6</sup>	Method <sup>7</sup>
Ozone (O <sub>3</sub> )	1-Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Ultraviolet Photometry	No federal standard	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m <sup>3</sup> )		0.075 ppm (147 µg/m <sup>3</sup> )		
Respirable Particulate Matter (PM <sub>10</sub> )	24-Hour	50 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	150 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>		–		
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	No Separate State Standard		35 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	15 µg/m <sup>3</sup>		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m <sup>3</sup> )	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m <sup>3</sup> )	None	Nondispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m <sup>3</sup> )		35 ppm (40 mg/m <sup>3</sup> )		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m <sup>3</sup> )		–		
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>8</sup>	Annual Arithmetic Mean	0.030 ppm (56 µg/m <sup>3</sup> )	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m <sup>3</sup> )	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (338 µg/m <sup>3</sup> )		0.100 ppm (see footnotes)	None	
Lead <sup>9</sup>	30-day average	1.5 µg/m <sup>3</sup>	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 µg/m <sup>3</sup>	Same as Primary Standard	
	Rolling 3-Month Average <sup>10</sup>	–		0.15 µg/m <sup>3</sup>		
Sulfur Dioxide (SO <sub>2</sub> )	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 µg/m <sup>3</sup> )	–	Spectrophotometry (Pararosaniline Method)
	24-Hour	0.04 ppm (105 µg/m <sup>3</sup> )		0.14 ppm (365 µg/m <sup>3</sup> )	–	
	3-Hour	–		–	0.5 ppm (1300 µg/m <sup>3</sup> )	
	1-Hour	0.25 ppm (655 µg/m <sup>3</sup> )		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		<b>No Federal Standards</b>		
Sulfates	24-Hour	25 µg/m <sup>3</sup>	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m <sup>3</sup> )	Ultraviolet Fluorescence			
Vinyl Chloride <sup>9</sup>	24-Hour	0.01 ppm (26 µg/m <sup>3</sup> )	Gas Chromatography			

Source: California Air Resources Board (ARB), February 16, 2010.

Table footnotes are provided on the following page.

Footnotes:

- <sup>1</sup> California standards for O<sub>3</sub>; CO (except Lake Tahoe); SO<sub>2</sub> (1- and 24-hour); NO<sub>2</sub>; suspended particulate matter, PM<sub>10</sub>; and visibility-reducing particles are values not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- <sup>2</sup> National standards (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> standard is attained when the fourth-highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM<sub>10</sub>, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 mg/m<sup>3</sup> is equal to or less than 1. For PM<sub>2.5</sub>, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.
- <sup>3</sup> Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- <sup>4</sup> Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
- <sup>5</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- <sup>6</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- <sup>7</sup> Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.
- <sup>8</sup> To attain this standard, the 3-year average of the 90th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).
- <sup>9</sup> The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- <sup>10</sup> National lead standard, rolling 3-month average: final rule signed October 15, 2008.

EPA = United States Environmental Protection Agency  
mg/m<sup>3</sup> = milligrams per cubic meter  
PM<sub>10</sub> = particulate matter less than 10 microns in size  
PM<sub>2.5</sub> = particulate matter less than 2.5 microns in size  
µg/m<sup>3</sup> = micrograms per cubic meter  
°C = degrees Celsius

**Table 2.13.2 Local Air Quality Levels**

Pollutant	Primary Standard		Year	Maximum Concentration <sup>1</sup>	Number of Days State/Federal Standard Exceeded
	California	Federal			
Carbon Monoxide (CO)	9.0 ppm for 8 hours	9 ppm for 8 hours	2006	2.9 ppm	0/0
			2007	2.9 ppm	0/0
			2008	3.4 ppm	0/0
Ozone (O <sub>3</sub> ) (1-Hour)	0.09 ppm for 1 hour	N/A	2006	0.113 ppm	6/NA
			2007	0.127 ppm	2/NA
			2008	0.105 ppm	2/NA
Ozone (O <sub>3</sub> ) (8-Hour)	0.07 ppm for 8 hour	0.075 ppm for 8 hours	2006	0.088 ppm	NA/3
			2007	0.099 ppm	NA/1
			2008	0.086 ppm	NA/5
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>2</sup>	0.25 ppm for 1 hour	N/A	2006	0.114 ppm	0/NA
			2007	0.086 ppm	0/NA
			2008	0.093 ppm	0/NA
Sulfur Dioxide (SO <sub>2</sub> ) <sup>2</sup>	0.25 ppm for 1 hour	0.14 ppm for 24 hours or 0.03 ppm annual arithmetic mean	2006	0.005 ppm	0/0
			2007	0.004 ppm	0/0
			2008	0.003 ppm	0/0
Particulate Matter (PM <sub>10</sub> ) <sup>3</sup>	50 µg/m <sup>3</sup> for 24 hours	150 µg/m <sup>3</sup> for 24 hours	2006	104 µg/m <sup>3</sup>	7/0
			2007	489 µg/m <sup>3</sup>	6/1
			2008	61 µg/m <sup>3</sup>	3/0
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>4</sup>	NA	35 µg/m <sup>3</sup> for 24 hours	2006	56.2 µg/m <sup>3</sup>	NA/7
			2007	79.4 µg/m <sup>3</sup>	NA/14
			2008	39.4 µg/m <sup>3</sup>	NA/2

Source: California Air Resources Board, ADAM Air Quality Data Statistics, [www.arb.ca.gov/adam/welcome.html](http://www.arb.ca.gov/adam/welcome.html).

<sup>1</sup> Maximum concentration is measured over the same period as the California Standard.

<sup>2</sup> Measurement taken at the Costa Mesa Monitoring Station.

<sup>3</sup> PM<sub>10</sub> and PM<sub>2.5</sub> exceedances are derived from the number of samples exceeded, not days.

<sup>4</sup> PM<sub>2.5</sub> exceedances are based on the EPA's revised standard of 35 µg/m<sup>3</sup>.

µg/m<sup>3</sup> micrograms per cubic meter

NA = not applicable

ppm = parts per million

Historical ambient air quality data are used to classify the attainment status for the Basin. More specifically, the data collected at the air quality monitoring stations are used by the United States Environmental Protection Agency (EPA) to identify regions as attainment or nonattainment, depending on whether the region met the requirements in the primary NAAQS. Nonattainment areas are imposed with additional restrictions as required by the EPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and comply with the NAAQS. The Basin's attainment status for each of the criteria pollutants is listed in Table 2.13.3.

**Table 2.13.3 Attainment Status of Criteria Pollutants in the South Coast Air Basin**

Pollutant	State	Federal
O <sub>3</sub> (1-hour)	Nonattainment	Revoked June 2005
O <sub>3</sub> (8-hour)	Nonattainment	Severe 17 Nonattainment <sup>1</sup>
PM <sub>10</sub>	Nonattainment	Serious Nonattainment <sup>2</sup>
PM <sub>2.5</sub>	Nonattainment	Nonattainment <sup>3</sup>
CO	Attainment	Attainment/Maintenance
NO <sub>2</sub>	Attainment	Attainment/Maintenance
All others	Attainment/Unclassified	Attainment/Unclassified

Source: California Air Resources Board (ARB), 2008 (<http://www.arb.ca.gov/desig/desig.htm>).

<sup>1</sup> The SCAQMD has requested that the federal 8-hour O<sub>3</sub> attainment status be changed to extreme with an attainment date of 2023.

<sup>2</sup> In October 2006, the EPA, in its final rule revision, eliminated the annual PM<sub>10</sub> standard.

<sup>3</sup> The PM<sub>2.5</sub> nonattainment designation is based on the 1997 standard. In 2006, the EPA revised the 24-hour standard. The 2006 PM<sub>2.5</sub> new standard of 35 µg/m<sup>3</sup> applies 1 year after the effective date of the new designation (April 2010).

µg/m<sup>3</sup> = micrograms per cubic meter

CO = carbon monoxide

EPA = United States Environmental Protection Agency

NO<sub>2</sub> = nitrogen dioxide

O<sub>3</sub> = ozone

PM<sub>10</sub> = particulate matter less than 10 microns in diameter

PM<sub>2.5</sub> = particulate matter less than 2.5 microns in diameter

SCAQMD = South Coast Air Quality Management District

The California Air Resources Board (ARB) administers the air quality policy in California. The CAAQS were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the NAAQS in Table 2.13.1, are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established for visibility-reducing particulates, hydrogen sulfide, and sulfates. The California Clean Air Act (CCAA), which was approved in 1988, requires that each local air district prepare and maintain an Air Quality Management Plan (AQMP) to achieve compliance with the CAAQS. These AQMPs also serve as the basis for preparation of the State Implementation Plan (SIP) for the State of California.

## 2.13.3 Environmental Consequences

### 2.13.3.1 Temporary Impacts

#### ***No Build Alternative (Alternative 1)***

The No Build Alternative would not result in the construction of any of the proposed improvements to SR-91 and therefore would not result in short-term impacts to air quality.

### **Build Alternatives 2 and 3**

Construction activities produce combustion emissions from various sources such as site grading, utility engines, on-site heavy-duty construction vehicles, equipment hauling materials to and from the site, and motor vehicles transporting the construction crew. Exhaust emissions during the construction envisioned on site will vary daily as construction activity levels change. The use of construction equipment on site will result in localized exhaust emissions. The California Department of Transportation (Caltrans) Standard Specifications for construction (Sections 10 and 18 for dust control and Section 39-3.06 for asphalt concrete plants) will be adhered to in order to reduce emissions as a result of construction equipment.

Additionally, the SCAQMD has established Rule 403 for reducing fugitive dust emissions (PM<sub>10</sub>). The best available control measures (BACMs), as specified in SCAQMD Rule 403, shall be incorporated into the project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day), fugitive dust emissions from construction activities would not result in adverse air quality impacts.

The project is located in Orange County, which is not among the counties listed as containing serpentine and ultramafic rock. Therefore, there would be no impacts from Naturally Occurring Asbestos during project construction.

#### **2.13.3.2 Permanent Impacts**

##### ***Regional Analysis***

The purpose of the proposed project is to eliminate and reduce existing and future operational conflicts on SR-91 between the northbound (NB) SR-55 connector and westbound (WB) SR-91 and the WB Tustin Avenue off-ramp during peak hours. The proposed project would not generate new vehicular traffic trips since it would not construct new homes or businesses. However, there is a possibility that some traffic currently utilizing other routes would be attracted to use the improved facility, thus resulting in increased vehicle miles traveled (VMT) within the project area.

Therefore, the potential impact of the proposed roadway improvement project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from the EMFAC2007 emission model.

A regional traffic analysis prepared by the Orange County Transportation Authority (OCTA; August 2009) estimated the impact that the proposed project would have on regional VMT and vehicle hours traveled (VHT). This VMT and VHT data, along

with the EMFAC2007 emission rates, were used to calculate the CO, ROG<sub>s</sub>, NO<sub>x</sub>, SO<sub>x</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions for the 2035 regional conditions. The results of the modeling are provided in Appendix B of the Air Quality Analysis report and summarized in Tables 2.13.4 and 2.13.5. As shown in Tables 2.13.4 and 2.13.5, the Build Alternatives would reduce the vehicle emissions within the region. Therefore, the Build Alternatives would not contribute substantially to regional vehicle emissions.

**Table 2.13.4 Alternative 2 Regional Vehicle Emissions (lbs/day)**

Pollutant	2035 No Build Emissions	2035 Alternative 2 Project Emissions	Project-Related Change
CO	160,082	160,036	-46
ROG <sub>s</sub>	7,853	7,849	-4
NO <sub>x</sub>	37,360	37,352	-8
SO <sub>x</sub>	881	880	-1
PM <sub>10</sub>	8,199	8,197	-2
PM <sub>2.5</sub>	5,133	5,131	-2

Source: LSA Associates, Inc., October 2009.  
CO = carbon monoxide  
lbs/day = pounds per day  
NO<sub>x</sub> = oxides of nitrogen  
PM<sub>2.5</sub> = particulate matter less than 2.5 microns in size  
PM<sub>10</sub> = particulate matter less than 10 microns in size  
ROG<sub>s</sub> = reactive organic gases  
SO<sub>x</sub> = oxides of sulfur

**Table 2.13.5 Alternative 3 Regional Vehicle Emissions (lbs/day)**

Pollutant	2035 No Build Emissions	2035 Alternative 3 Project Emissions	Project-Related Change
CO	160,082	159,850	-232
ROG <sub>s</sub>	7,853	7,832	-22
NO <sub>x</sub>	37,360	37,319	-40
SO <sub>x</sub>	881	876	-4
PM <sub>10</sub>	8,199	8,187	-12
PM <sub>2.5</sub>	5,133	5,121	-13

Source: LSA Associates, Inc., October 2009.  
CO = carbon monoxide  
lbs/day = pounds per day  
NO<sub>x</sub> = oxides of nitrogen  
PM<sub>2.5</sub> = particulate matter less than 2.5 microns in size  
PM<sub>10</sub> = particulate matter less than 10 microns in size  
ROG<sub>s</sub> = reactive organic gases  
SO<sub>x</sub> = oxides of sulfur

### **CO Hot-Spot Analysis**

The Caltrans *Transportation Project-Level Carbon Monoxide Protocol* (December 1997) was used to assess the project's impact on local CO concentrations. Based on this protocol, a screening analysis was conducted to determine whether the proposed project would result in any CO hot spots. Localized emissions of CO may increase with implementation of the proposed project. However, as described in detail in the *Air Quality Analysis* (LSA Associates, Inc. February 2010), Build Alternatives 2 and 3 are not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, the potential project CO impact has been sufficiently addressed, and no further analysis is needed.

### **Mobile Source Air Toxics**

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, other mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act (CAA) Amendments of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8,430; February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS).<sup>1</sup> In addition, the EPA identified the following seven compounds with substantial contributions from mobile sources that are among the national- and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA):<sup>2</sup> acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (DPM), formaldehyde, naphthalene, and polycyclic organic matter (POM). While FHWA considers these to be the priority Mobile Source Air Toxics (MSAT), the list is subject to change and may be adjusted in response to future EPA rules.

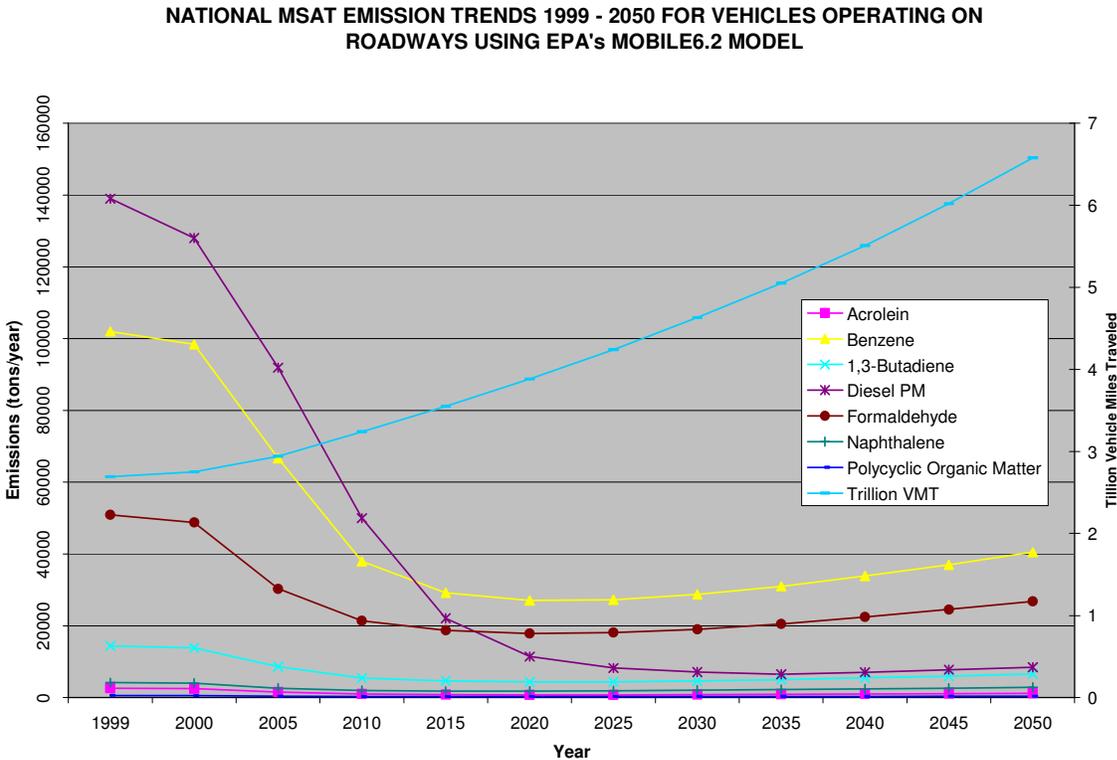
The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA

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<sup>1</sup> <http://www.epa.gov/ncea/iris/index.html>.

<sup>2</sup> <http://www.epa.gov/ttn/atw/nata1999/>.

analysis using EPA’s MOBILE6.2 model, even if VMT increase by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSATs is projected from 1999 to 2050, as shown in Figure 2.13-1. The projected reduction in MSAT emissions would be slightly different in California due to the use of the EMFAC2007 emission model in place of the MOBILE6.2 model.



Source: <http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm>.

**Figure 2.13-1 National MSAT Emission Trends**

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA).

In September 2009, FHWA issued a memorandum titled Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents<sup>1</sup> to advise FHWA division offices as to when and how to analyze MSATs in the NEPA process for highways. This document is an update to the previous guidance released in February 2006.

The guidance is described as interim because MSAT science is still evolving. As the science progresses, FHWA will update the guidance. This analysis follows the FHWA guidance.

*Information that is Unavailable or Incomplete*

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. It is the lead authority for administering the CAA and its amendments and has specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects."<sup>2</sup> Each report contains assessments of noncancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures, perhaps with uncertainty spanning an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of

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<sup>1</sup> <http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm>.

<sup>2</sup> EPA, <http://www.epa.gov/ncea/iris/index.html>

asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations<sup>1</sup> or in the future as vehicle emissions substantially decrease.<sup>2</sup>

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts, with each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by EPA's MOBILE6.2 model, the California Environmental Protection Agency (CalEPA) EMFAC2007 model, and the EPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates DPM emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in a National Cooperative Highway Research Program (NCHRP) study,<sup>3</sup> which documents poor model performance at 10 sites across the country (i.e., 3 sites where intensive monitoring was conducted plus an additional 7 sites with less intensive monitoring). The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is

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<sup>1</sup> HEI, <http://pubs.healtheffects.org/view.php?id=282>

<sup>2</sup> HEI, <http://pubs.healtheffects.org/view.php?id=306>

<sup>3</sup> EPA, [http://www.epa.gov/scram001/dispersion\\_alt.htm#hyroad](http://www.epa.gov/scram001/dispersion_alt.htm#hyroad)

particularly difficult to reliably forecast MSAT exposure near roadways and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, which is a concern expressed by HEI.<sup>1</sup> As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for DPM. The EPA<sup>2</sup> and HEI<sup>3</sup> have not established a basis for quantitative risk assessment of DPM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires the EPA to determine a “safe” or “acceptable” level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the United States Court of Appeals for the District of Columbia Circuit upheld EPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to

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<sup>1</sup> <http://pubs.healtheffects.org/view.php?id=282>

<sup>2</sup> <http://www.epa.gov/risk/basicinformation.htm#g>

<sup>3</sup> <http://pubs.healtheffects.org/getfile.php?u=395>

be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers who would need to weigh this information against project benefits such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, which are better suited for quantitative analysis.

**Qualitative MSAT Analysis**

For each of the project alternatives, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. This type of project improves roadway operations by reducing traffic congestion and improving traffic operations. As shown in Table 2.13.6, the Build Alternatives would either improve the freeway mainline level of service (LOS) or maintain the LOS at the same level when compared to the No Build Alternative.

**Table 2.13.6 2035 Freeway Mainline LOS**

Alternative	SR-91 Downstream		SR-91 Upstream	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Alternative 1 (No Build)	F	E	E	C
Alternative 2	E	D	E	C
Alternative 3	D	C	D	C

Source: Caltrans, May 2009.  
LOS = level of service  
SR-91 = State Route 91

For all of the future alternatives (No Build and Build), emissions are projected to be lower than present levels in the design year as a result of the EPA’s national control programs, which are projected to reduce MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future than they are today.

In summary, under the Build Alternatives, it is expected that there would be similar or lower MSAT emissions in the study area relative to the No Build Alternative due to the improvement of the LOS. On a regional basis, the EPA’s vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be substantially lower than they are today.

### **Air Quality Management Plan Consistency Analysis**

A consistency analysis determination plays an essential role in local agency project review by linking local planning and unique individual projects to the AQMP in the following ways: it fulfills the CEQA goal of fully informing local agency decision-makers of the environmental costs of the project under consideration at a stage early enough to ensure that air quality concerns are fully addressed and it provides the local agency with ongoing information, assuring local decision-makers that they are making real contributions to clean air goals defined in the most current AQMP (adopted 2003 and updated in 2007). Implementation of the proposed project would also not delay timely implementation of the Transportation Control Measures (TCMs) identified in the AQMP. As shown above, Build Alternatives 2 and 3 would not contribute to or cause deterioration of existing air quality; therefore, mitigation measures are not required for the long-term operation of the project.

#### **2.13.3.3 Avoidance, Minimization, and/or Mitigation Measures**

The following minimization measure has been identified to minimize potential emissions of pollutants during construction activities:

- A-1** In order to minimize construction-related emissions, all construction vehicles and construction equipment shall be required to be equipped with the State-mandated emission control devices pursuant to State emission regulations and standard construction practices. Short-term construction particulate matter less than 10 microns in diameter (PM10) emissions shall be further reduced with the implementation of required dust suppression measures outlined within South Coast Air Quality Management District (SCAQMD) Rule 403, Caltrans Standard Specifications for construction [Section 10 and 18 (Dust Control), and Section 39-3.06 (Asphalt Concrete Plants)].

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## 2.14 Noise

### 2.14.1 Regulatory Setting

The California Environmental Quality Act (CEQA) provides the broad basis for analyzing and abating highway traffic noise effects. The intent of this law is to promote the general welfare and to foster a healthy environment. CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

Table 2.14.1 lists noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

**Table 2.14.1 Noise Levels of Common Activities**

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft) Commercial Area	70	Vacuum Cleaner at 3 m (10 ft) Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

## **2.14.2 Affected Environment**

This section is based on the Noise Study Report (NSR) (Caltrans, April 7, 2010).

### **2.14.2.1 Existing Land Uses and Sensitive Receptors**

For purposes of the noise analysis, the project area was divided into two areas. Area I is the west side of State Route 91 (SR-91) from East Santa Ana Canyon Road to the Santa Ana River north of Riverdale Avenue overcrossing. Residences in this area are exposed to traffic noise from SR-91 and State Route 55 (SR-55).

Area II is located on the north and northeast side of SR-91 and covers mostly residential development on East Summer Creek Lane. Additionally, Area II, includes a hotel, the Kaiser Medical facility, Santa Ana River Lakes, Santa Ana River Trail, and some industrial and commercial buildings further west. The residential area is shielded by existing sound walls that range in height from 12 to 18 feet (ft). However, since these homes are depressed by as much as 5 ft below SR-91, the effective height of the sound walls from the residences varies between 16 and 22 ft. A small portion of the residential development, approximately 200 ft in length, is shielded by a sound wall that is 12 ft in height on the freeway side. The area behind this 12 ft wall is depressed so that only the top portions of the two-story homes are visible from the freeway. Existing sound walls are depicted in Figure 2.14-1.

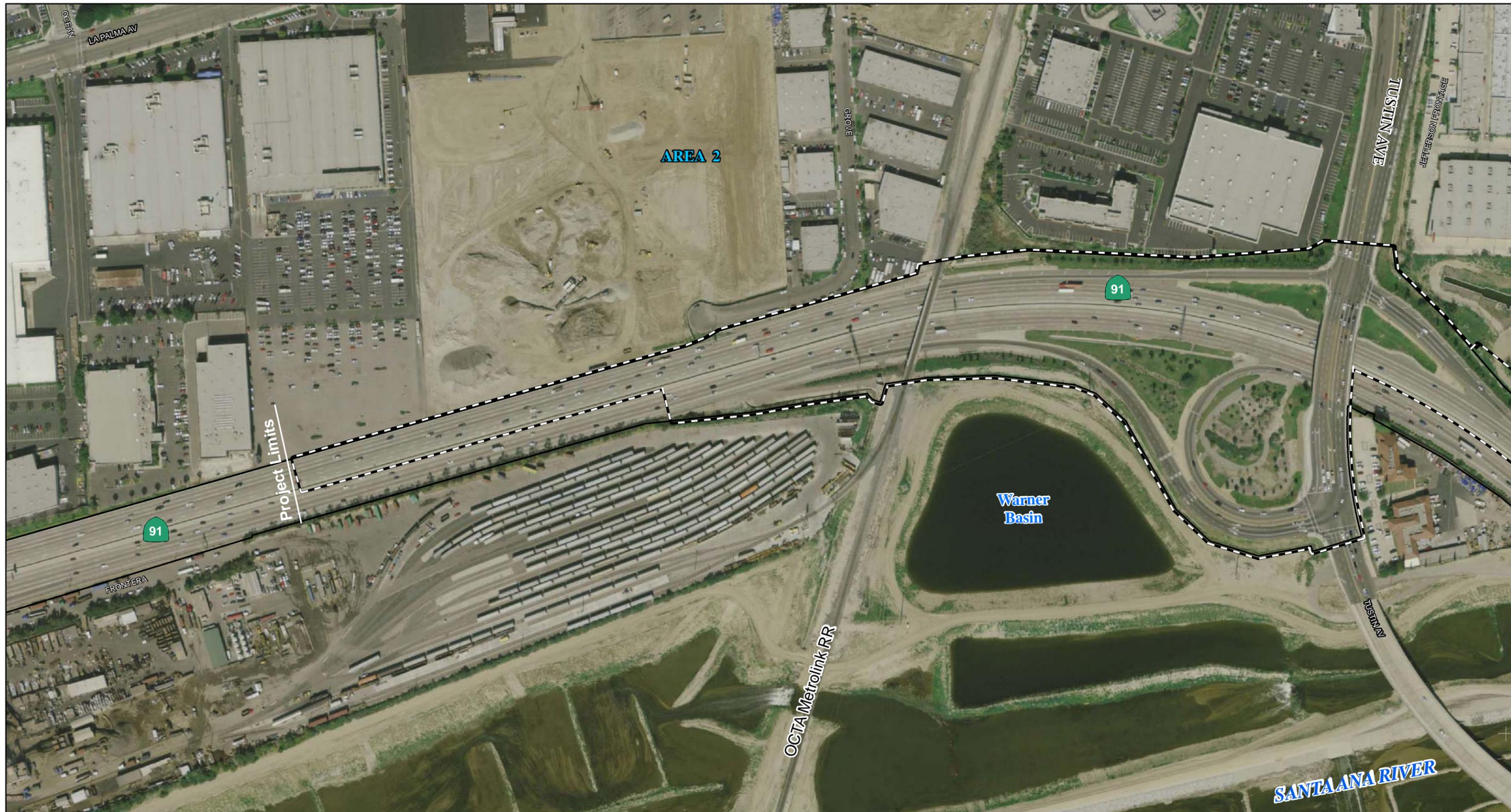
### **2.14.2.2 Environmental Consequences**

#### ***Area I Existing Noise Levels***

Traffic noise impacts were evaluated at the Pinetree Condominiums and other residential areas located on the west side of SR-91 from East Santa Ana Canyon Road to the Santa Ana River north of the Riverdale Avenue overcrossing. The existing noise levels in Area 1 range from 63 to 74 A-weighted decibels (dBA) equivalent continuous noise level ( $L_{eq}$ ).

#### ***Area II Existing Noise Levels***

Short-term noise measurements were conducted on November 6, 2008, at four receptor locations in the residential area behind the 12 ft sound wall in Area II. The four receptor locations are shown in Figure 2.14-1. The results of the short-term noise measurements are summarized in Table 2.14.2. As shown in this Table 2.14.2, the existing short-term noise level in Area II ranges from 61 to 65 dBA  $L_{eq}$ .



LEGEND

-  Project Area
-  Existing Right-of-Way
-  Existing Soundwall
-  Calibration Location
-  Short Term Receptor Location
-  Area 1
-  Area 2

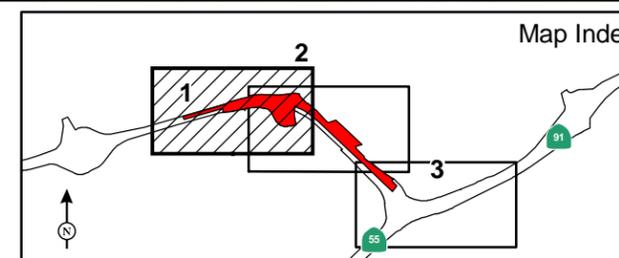


FIGURE 2.14-1  
Sheet 1 of 3

Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction  
Existing Sound Walls and Receptor Locations  
Area 1 and Area 2  
12-ORA-91 PM 7.9/9.5  
Project ID No. 120000078 (EA# 0C5600)

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**LEGEND**

-  Project Area
-  Existing Right-of-Way
-  Existing Soundwall
-  Calibration Location
-  Short Term Receptor Location
-  Area 1
-  Area 2

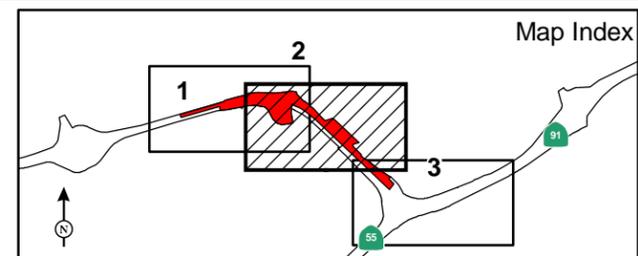
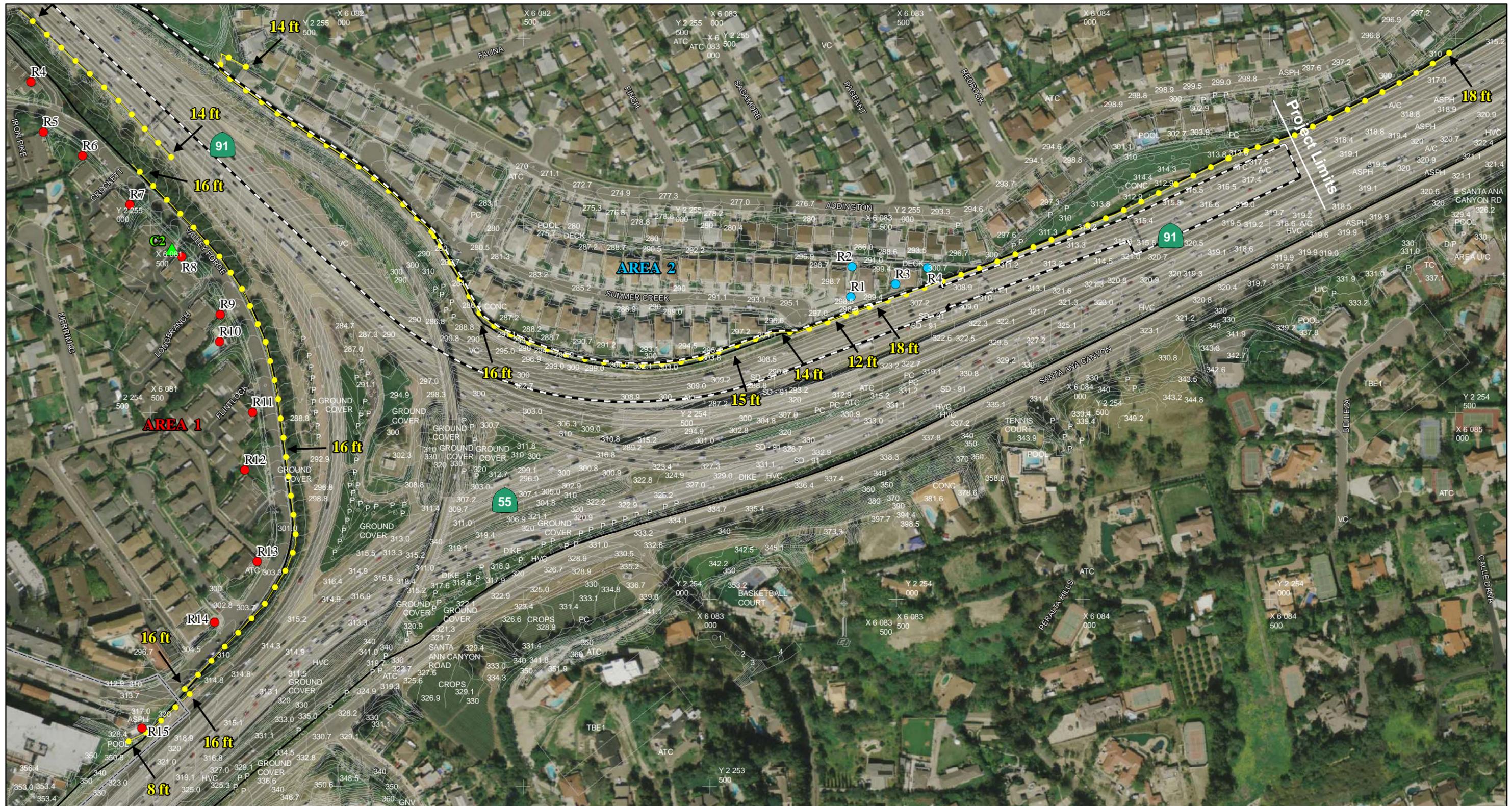


FIGURE 2.14-1  
Sheet 2 of 3

Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction  
Existing Sound Walls and Receptor Locations  
Area 1 and Area 2  
12-ORA-91 PM 7.9/9.5  
Project ID No. 120000078 (EA# 0C5600)

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**LEGEND**

- Project Area
- Existing Right-of-Way
- Existing Soundwall
- Calibration Location
- Short Term Receptor Location
- Area 1
- Area 2

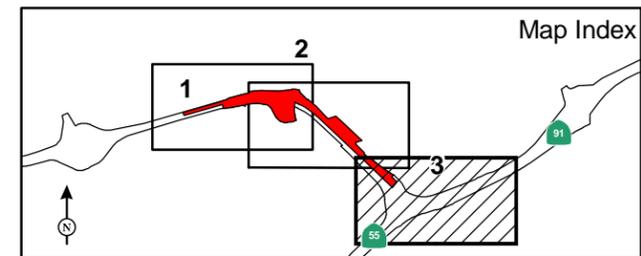


FIGURE 2.14-1  
Sheet 3 of 3

Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction  
Existing Sound Walls and Receptor Locations  
Area 1 and Area 2  
12-ORA-91 PM 7.9/9.5  
Project ID No. 120000078 (EA# 0C5600)

SOURCE: Digital Globe (2008), RBF (05/2009); SR-91 Westbound Widening Project Noise Study Report, Caltrans (April 2010)

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**Table 2.14.2 Existing Noise Levels**

Receptors	Locations	Short-term (10-minute) Noise Measurements (dBA L <sub>eq</sub> )	Existing Noise Level Adjusted for Peak Hour (dBA L <sub>eq</sub> )
R-1	Front yard	65.0	66.6
R-2	4275 East Summer Creek Lane (back yard)	61.3	63.4
R-3	Front yard	64.8	66.3
R-4	4295 East Summer Creek Lane (back yard)	61.8	62.8

Source: Noise Study Report, SR-91 Westbound Widening Project (Caltrans, April 7, 2010)  
dBA = A-weighted decibels  
L<sub>eq</sub> = equivalent continuous noise level

Receptor R-2 is located behind the 12 ft portion of the existing sound wall that is 12 ft high on the freeway side and 16 ft high on the residence side. Receptor R-4 is located behind a soundwall that is 17 ft high on both the freeway and residence side. It appears from Table 2.14.2 that the extra 5 ft height of the wall between Receptor R-4 and R2 has caused a noise reduction of 0.5 dBA.

For traffic noise analysis purposes, no sensitive receptors were recognized within the vicinity of the freeway for the commercial and industrial uses, the Santa Ana River Lakes (SARL), and the Santa Ana River Trail (SART).

### **2.14.2.3 Temporary Impacts**

#### ***Alternative 1 (No Build)***

The No Build Alternative would not involve the use of construction equipment; therefore, no temporary noise impacts would occur.

#### ***Build Alternatives 2 and 3***

During construction, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Table 2.14.3 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. As indicated, equipment involved in construction is expected to generate maximum noise levels (L<sub>max</sub>) ranging from 70 dBA to 90 dBA intermittently at a distance of 50 ft. Noise produced by construction equipment would be reduced over distances at the rate of approximately 6 dBA per doubling of distance.

**Table 2.14.3 Construction  
Equipment Noise Levels**

Type of Equipment	Maximum Level (dBA L <sub>max</sub> at 50 ft)
Pile Driving	93
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: Transit Noise and Vibration Impact  
Assessment, FTA-VA-90-1003-06 (United  
States Department of Transportation, May  
2006).

dBA = A-weighted decibels

ft = feet

L<sub>max</sub> = maximum noise levels

Pile driving will be conducted during project construction during widening of the bridge over the Santa Ana River. Pile driving generates noise levels of approximately 93 dBA L<sub>max</sub> at a distance of 50 ft. If pile driving is conducted concurrently with site preparation, the construction site could potentially generate a noise level of up to 94 dBA L<sub>max</sub> at a distance of 50 ft from the active construction area with both pile-driving activity and conventional heavy-duty construction equipment.

Because construction activity would be conducted in accordance with Department standard specifications, as specified in Measure N-1, and would be short-term, intermittent, and in most cases dominated by traffic noise, no substantial adverse noise impacts from construction are anticipated.

#### **2.14.2.4 Permanent Impacts**

##### ***Alternative 1 (No Build)***

The No-Build Alternative does not propose construction of any improvements; therefore, therefore, no permanent noise impacts would occur.

##### ***Build Alternatives 2 and 3***

###### ***Area I***

Existing noise levels in this area ranged from 63 to 74 dBA L<sub>eq</sub>. Four sound wall options were analyzed, and only one sound wall option (Option 4) qualified under the feasible criteria. Option 4 achieved the required 5 dBA reduction in sound levels at four residences. The location of the sound wall was at the right-of-way line and the shoulder of eastbound SR-91. Based on the most recent Base Allowance, the

reasonableness allowance for construction of a sound wall to protect the four benefitted residences is \$196,000. Based on current construction costs, the total estimated cost of the sound wall to protect these residences is \$804,864 which is much higher than the reasonable allowance. Therefore, no sound wall is recommended for Area I.

**Area II**

Equation N-2135.2 of the Department Technical Noise Supplement (TeNS) was used to calculate the noise increase that would occur during operation of the Build Alternatives at Receptor R-2.

Table 2.14.4 shows the existing and future Build Alternatives predicted peak hour noise levels. As shown in Table 2.14.4, under the future Build Alternatives, the addition of two lanes would increase traffic noise by 0.4 dBA at Receptors R-1 through R-4 compared to their corresponding existing conditions. This noise increase is not substantial and would not be readily perceptible. Therefore, the project would not cause a significant noise increase under CEQA, and no mitigation of traffic noise is required.

**Table 2.14.4 Existing Peak-Hour and Predicted Future Noise Levels**

Receptor No.	Existing Peak Hour (dBA $L_{eq}$ )	Predicted Future Peak Hour (dBA $L_{eq}$ )
R-1	66.2	66.6
R-2	63	63.4
R-3	65.9	66.3
R-4	62.4	62.8

Source: Noise Study Report, SR-91 Westbound Widening Project (Caltrans, April 7, 2010)  
 dBA = A-weighted decibels  
 $L_{eq}$  = equivalent continuous noise level

For Area II, increasing the height of the existing 12 ft sound wall was considered. Under the Traffic Noise Analysis Protocol, the increase of height of an existing sound wall must result in at least a 5 dBA noise reduction before it becomes feasible. For Area II, all receptors are protected by existing sound walls. Some of the receptors in this area show a noise impact with traffic noise levels approaching or exceeding 67dBA  $L_{eq}$ . However, because most sound walls are already present at or near the maximum height, the noise would not be reduced by a minimum 5 dBA, and therefore, no reasonability calculation was conducted to determine if adding to the

sound wall height would be feasible. Therefore, no abatement measures are recommended for this area.

Additionally, equation N-2135.2 of the TeNs was used to calculate any potential noise increase during operation of the Build Alternatives at the SARL and SART. The future post construction noise increase was calculated at 0.4 dBA. As such, the proposed project has no considerable noise impact to the SARL and SART.

### **2.14.3 Avoidance, Minimization, and/or Mitigation Measures**

Standard California Department of Transportation (Department) measures are provided for temporary noise impacts associated with the Build Alternatives.

- N-1** To minimize the construction noise impact for sensitive land uses adjacent to the project site, the construction contractor shall comply with the California Department of Transportation Standard Specifications, Section 14.8.02, “Noise Control,” and also with Standard Special Provisions S5-310. The noise level from the Contractor’s operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dBA  $L_{eq}(h)$  at a distance of 50 feet (ft). The Contractor shall use an alternative warning method instead of a sound signal unless required by safety laws. In addition, the Contractor shall equip all internal combustion engines with the manufacturer-recommended muffler and shall not operate any internal combustion engine on the job site without the appropriate muffler.

## **2.15 Biological Resources**

### **2.15.1 Natural Communities**

#### **2.15.1.1 Regulatory Setting**

This section of the document discusses natural communities of concern. Habitats are considered to be of special concern based on (1) federal, State, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals occurring on site. The focus of this section is on biological communities, not on 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, thereby lessening its biological value.

Wetlands and Other Waters are discussed in Section 2.15.2. Specific animal species are discussed in Section 2.15.3. Please refer to Chapter 3 for coordination efforts with resource agencies.

#### **2.15.1.2 Affected Environment**

This section is based on the Natural Environment Study (NES) (May 2010).

##### ***Biological Study Area***

The Biological Study Area (BSA) for the project is directly on and adjacent to northbound SR-55 and westbound SR-91. The BSA is depicted in Figure 2.15-1. The BSA extends 1.4 linear miles beginning on the northbound SR-55 and extends to the SR-91 connector and then continues westbound on the SR-91. The BSA included areas within Department right-of-way and all areas of potential direct effect. The limits of the BSA were extended beyond the maximum extent of potential direct effect where necessary to identify sensitive biological resources within and immediately adjacent to the SR-91 project area, between post-miles 7.9 and 9.5.

##### ***Natural Communities***

No native plant communities exist within the BSA. The entire project area is almost fully developed with paved surfaces and ornamental or landscape plantings. Vegetation communities are depicted in Figure 2.15-1. There is a small slope, along the SR-91 just south of the Santa Ana River that has been planted with Brittlebush (*Encelia farinosa*). Other than this landscaped native plant section, no other native plant communities were detected. The BSA does contain some parcels with patchy

ruderal vegetation. The Santa Ana River section of the BSA also contains little to no vegetation. This area is routinely bulldozed thus it has little opportunity to support vegetation for any length of time.

Vegetation communities within the BSA were categorized into the following categories; developed/ornamental, ruderal, bare ground and riverine. Some of the ornamental and bare ground areas are mixed with ruderal vegetation. Table 2.15.1 lists the acreage of each of these communities. These communities are discussed in greater detail below.

**Table 2.15.1 Vegetation Communities  
Occurring within the BSA**

Vegetation Community		Total acres
Disturbed Vegetation	Developed/Ornamental	<b>35.5</b>
	Ruderal	<b>2.2</b>
	Bare Ground	<b>1.3</b>
	Riverine	<b>5.6</b>
	<b>Total</b>	<b>44.6</b>

Source: Natural Environment Study (California Department of Transportation, March 2010)  
BSA = Biological Study Area

#### *Developed Lands and Ornamental Vegetation*

Existing roadways and man-made structures (homes and buildings) comprise the developed lands category. Developed land comprises the majority of the BSA (35.5 ac).

Ornamental vegetation includes areas that have been planted and may contain native and/or non-native vegetation. Some of the ornamental plants found within the project area include Peruvian Pepper Tree (*Schinus molle*), Sweet alyssum (*Lobularia maritima*) and Brisbane Box (*Tristania conferta*). These ornamental plants are also found throughout the entire project alignment. Some ruderal vegetation is also included within this category.

#### *Ruderal Vegetation*

This plant community consists of volunteer plant species that propagate in disturbed habitat areas. Ruderal vegetation can be found throughout the project area and comprises approximately 2.2 ac of the BSA. Some examples of ruderal plants found within the BSA are Bermuda grass (*Cynodon dactylon*), telegraph weed (*Heterotheca*



FIGURE 2.15-1  
(Page 1 of 3)

*Westbound State Route 91 Lane Extension  
and Auxiliary Lane Reconstruction*  
Biological Resources  
12-ORA-91 PM 7.9/9.5  
Project ID No. 120000078(EA#0C5600)

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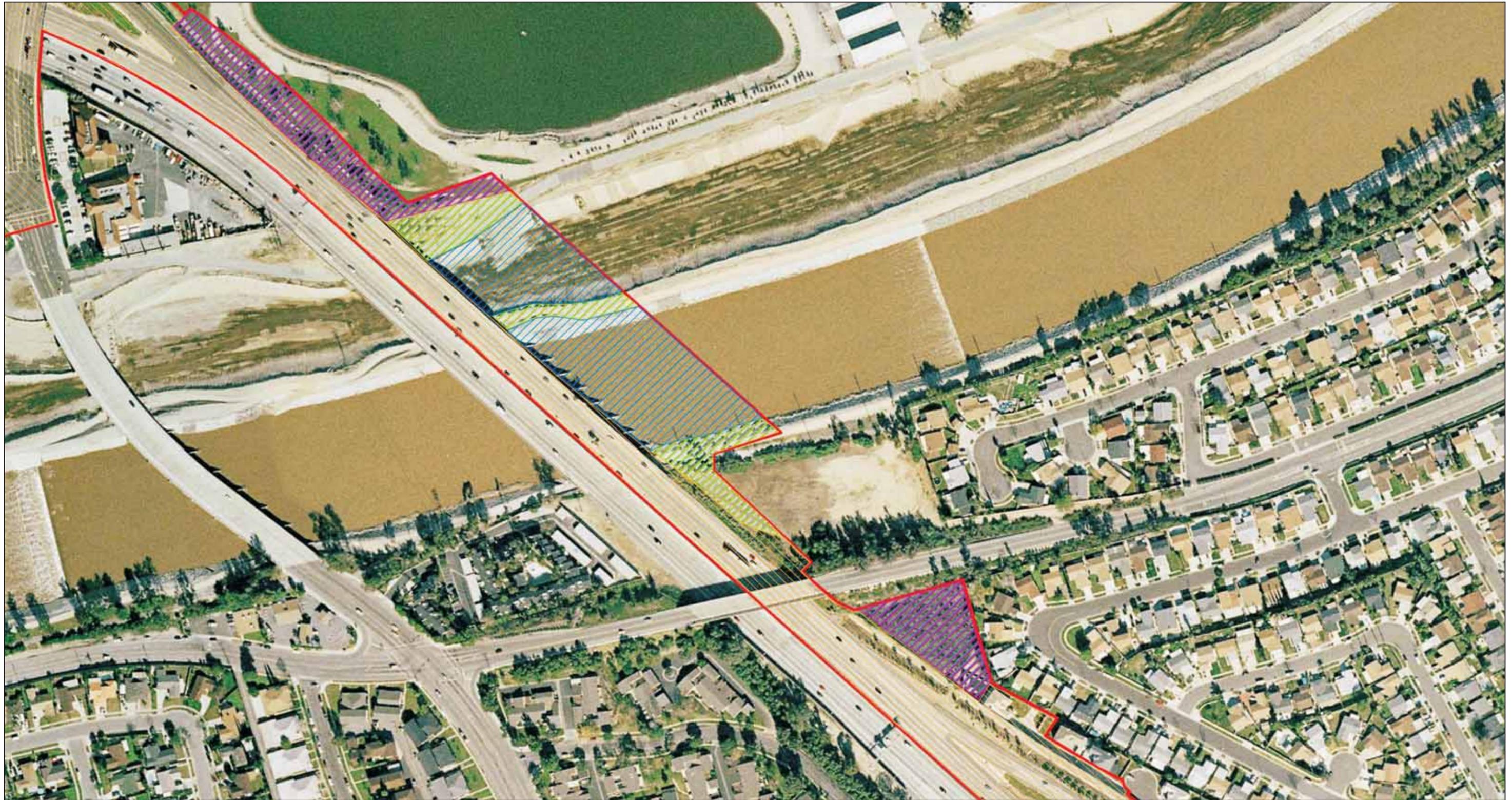
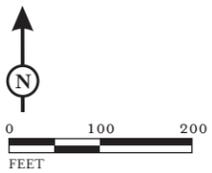


FIGURE 2.15-1  
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Legend	
	Developed Ornamental
	Riverine
	Bare Ground
	Ruderal
	BSA

*Westbound State Route 91 Lane Extension  
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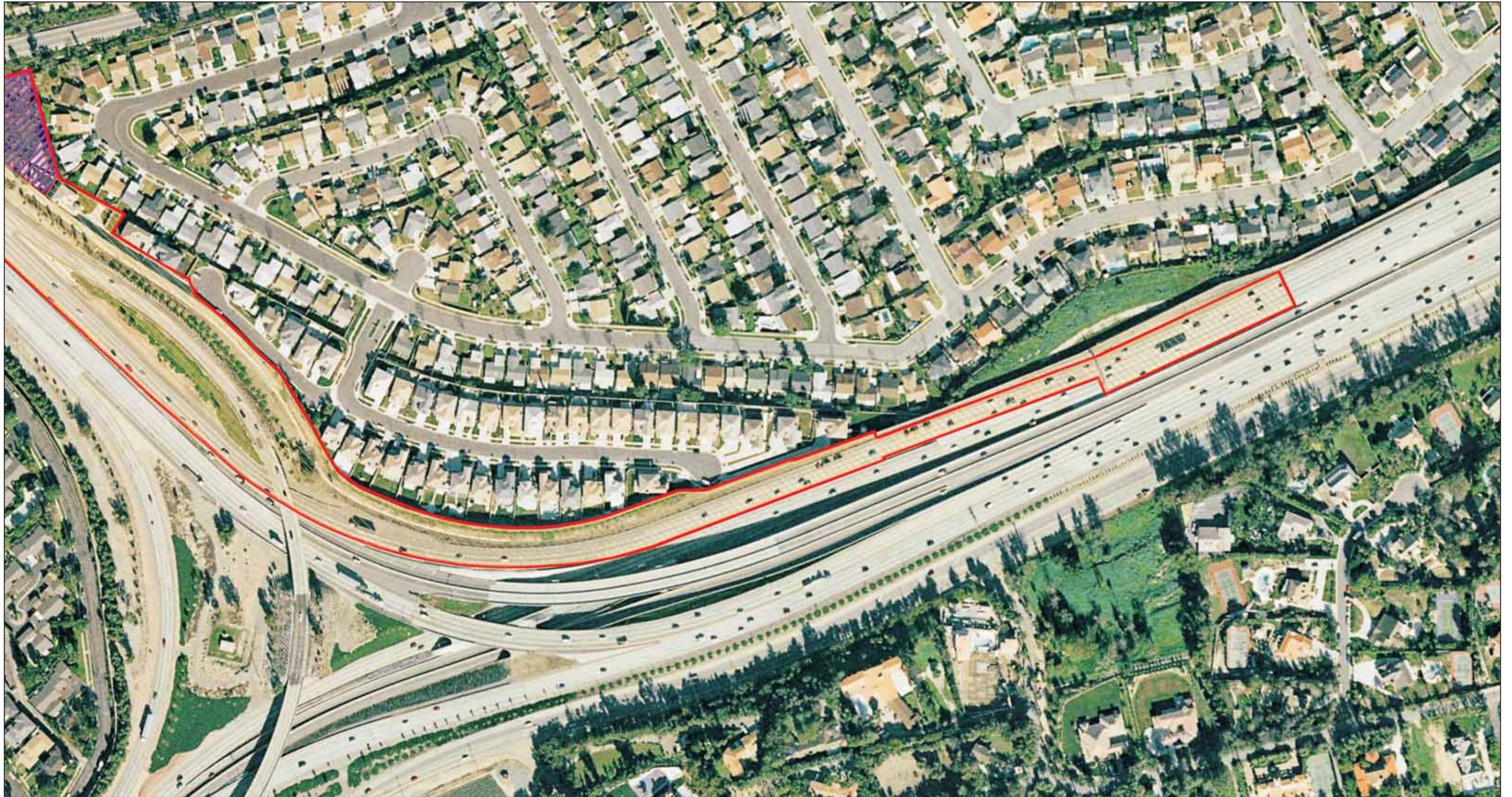
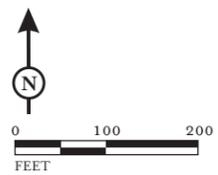


FIGURE 2.15-1  
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*grandiflora*), common sow thistle (*Sonchus oleraceus*), wild oat (*Avena sp.*) and foxtail chess (*Bromus madritensis*).

### ***Bare Ground***

Sections of land within the BSA were noticeably devoid of vegetation. These areas are routinely altered and/or the soils have been compacted to the point that vegetation is unable to grow. Bare ground comprises approximately 1.3 acres of the BSA.

### ***Riverine***

Riverine habitats would typically include riparian plant communities. However, due to the activities of the County of Orange, no native riparian plant communities occur within the BSA. The typical association of these riparian habitat types with drainages means that they are “protected” under the Fish and Game Code and, to a certain extent, by the Clean Water Act (CWA). These habitats are considered high-quality wildlife habitats because they provide protection cover, water and food for a variety of species. Many mammal species are riparian habitat obligates. Other animals, including large mammals, require access to water and use bands of riparian habitat as wildlife corridors. As such, the CDFG regulates riparian areas only to the extent that those areas are associated with the banks of a stream or lake shorelines. Sections of land within the BSA are within the Santa Ana River (bed and banks). These areas are routinely altered to the point that vegetation is unable to sustain itself. Riverine habitat comprises approximately 5.6 acres of the BSA. Riverine habitat is the only Natural Community of Special Concern within the BSA.

### ***Wildlife Corridors***

The Santa Ana River (within this BSA) is a natural feature that could aid in wildlife movement. This section of the river within the BSA is surrounded by urban development. This may be the only feature that some local wildlife species would have the potential to use in order to obtain food and water and travel more easily within this heavily developed area. Migration corridors are routes that wildlife species take when traveling between separate winter and summer habitats. Migration corridors are also important in allowing easier access to mates and juvenile dispersal.

### 2.15.1.3 Environmental Consequences

#### **Temporary Impacts**

##### *Alternative 1 (No Build)*

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative would result in no temporary adverse impacts related to natural communities.

##### *Build Alternatives 2 and 3*

**Riverine Habitat.** Build Alternatives 2 and 3 would result in 4.07 and 4.43 ac, respectively, of temporary impacts to riverine habitat. Areas of temporary impacts would only be impacted during construction to allow for construction and equipment staging.

In addition to direct temporary impacts, the proposed project would result in temporary indirect impacts through the degradation of riverine habitats. Temporary indirect impacts include construction-related impacts such as dust, potential fuel spills from construction equipment, possible night lighting during construction, and activities of equipment or personnel outside designated construction areas, as well as operational impacts such as impacts on adjacent habitats caused by storm water runoff, traffic, and litter. Indirect impacts are difficult to quantify since they are a result of normal activities and can change from day to day.

**Wildlife Corridors.** Temporary impacts to wildlife corridors could occur during construction due to the increased presence of equipment, structures, and construction personnel. During construction, extension of bridge piers and large pieces of equipment required for work at the Santa Ana River Bridge could potentially act as barriers to wildlife movement and restrict wildlife use of the corridors in the construction areas. As wildlife movement primarily occurs at night, and construction activities at the potential wildlife corridors would primarily occur during the day, temporary impacts to wildlife crossings would be minimal.

#### **Permanent Impacts**

##### *Alternative 1 (No Build)*

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative would result in no permanent adverse impacts related to natural communities.

### *Build Alternatives 2 and 3*

**Riverine Habitat.** Build Alternatives 2 and 3 would result in 0.17 and 0.43 ac, respectively, of permanent impacts to riverine habitat.

Permanent indirect impacts to riverine habitats include shading, enhancing germination and proliferation of nonnative invasive plant species. Construction may indirectly impact riverine habitats permanently though enhancing germination and proliferation of nonnative invasive plant species. Invasive plant species are those that out compete native plants and are of particular concern. Indirect impacts are difficult to quantify since they are a result of normal activities and may change from day to day.

In addition, as discussed in detail in Section 2.9, Water Quality and Storm Water Runoff, site design, source control, and treatment Best Management Practices (BMPs) would be incorporated into the project to reduce pollutants of concern in storm water runoff.

**Wildlife Corridors.** Additional structures or pilings at potential wildlife corridors have the potential to obstruct wildlife movement. Alternatives 2 and 3 would extend the bridge piers at the Santa Ana River Bridge. However, the bridge pier extensions proposed at these locations would be spaced wide enough and within the same alignment as the existing piers to not obstruct wildlife movement. Because there would be no permanent obstruction to wildlife movement, project impacts to wildlife corridors would be minimal.

#### **2.15.1.4 Avoidance, Minimization, and/or Mitigation Measures**

The existing riverine habitat falls under the regulatory jurisdiction of the United States Army Corps of Engineers and the California Department of Fish and Game. Therefore, compensatory mitigation for riverine habitat is discussed later in Section 2.15.2, Wetlands and Other Waters. Measures to reduce indirect impacts to riverine habitat as a result of invasive species are discussed later in Section 2.15.4, Invasive Species. Measures to reduce permanent impacts to riverine habitat from storm water runoff are discussed previously in Section 2.9, Water Quality and Storm Water Runoff. In addition to these measures, the following measure would avoid and/or minimize impacts to natural communities:

**BIO-1** Prior to clearing or construction, highly visible barriers (such as orange construction fencing) will be installed around riverine areas adjacent to the project footprint to designate Environmentally

Sensitive Areas (ESAs) to be preserved. No grading or fill activity of any type will be permitted within these ESAs. In addition, heavy equipment, including motor vehicles, will not be allowed to operate within the ESAs. All construction equipment will be operated in a manner so as to prevent accidental damage to nearby preserved areas. No structure of any kind, or incidental storage of equipment or supplies, will be allowed within these protected zones. Silt fence barriers will be installed at the ESA boundary to prevent accidental deposition of fill material in areas where vegetation is immediately adjacent to planned grading activities.

## **2.15.2 Wetlands and Other Waters**

### **2.15.2.1 Regulatory Setting**

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and 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 subject to 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 no discharge of dredged or fill material can 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 (ACOE) with oversight by the United States Environmental Protection Agency (EPA).

At the state level, wetlands and waters are regulated primarily by the Department of Fish and Game (CDFG) and the Regional Water Quality Control Boards (RWQCBs). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600–1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a

river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG 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 ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. See the Water Quality section for additional details. Please refer to Chapter 3 for coordination efforts with resource agencies.

### **2.15.2.2 Affected Environment**

This section is based on the Natural Environment Study (NES) (May 2010) and the Jurisdictional Delineation Report (January 2010).

The existing riverine habitat discussed previously in Section 2.15.1, Natural Communities, falls under the regulatory jurisdiction of the ACOE, CDFG, and RWQCB. These jurisdictional areas are described below. All jurisdictional areas are shown in Figure 2.15-2.

#### ***ACOE Jurisdiction***

The Santa Ana River as well as several drainages that connect to the Santa Ana River are located within the Biological Study Area (BSA). All of these drainages have been altered in some form or are wholly manmade. The Santa Ana River is the only relatively permanent water within the study area and is considered jurisdictional by the Corps. No significant nexus determination is required for the Santa Ana River per Corps guidance.

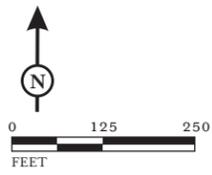
With the exception of the Santa Ana River itself, all of the drainages within the study area would require a significant nexus determination. Drainages within the study area that require a significant nexus determination do not have a relatively permanent flow but appear to have a connection to the Santa Ana River.

Total ACOE jurisdictional areas within the BSA total 5.57 ac. The total acreage of potential ACOE wetland waters within the BSA is 0.77 acre (ac). The total acreage of potential ACOE nonwetland waters of the U.S, within the BSA is 4.80 ac, of which

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FIGURE 2.15-2  
(Page 1 of 3)



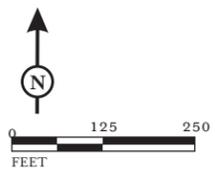
- Legend**
-  Presumed Wetland
  -  Temporary Construction Easement
  -  Maximum Construction Limit
  -  ACOE Jurisdiction
  -  CDFG Jurisdiction
  -  BSA

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FIGURE 2.15-2  
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- Legend**
-  Presumed Wetland
  -  Temporary Construction Easement
  -  Maximum Construction Limit
  -  ACOE Jurisdiction
  -  CDFG Jurisdiction
  -  BSA

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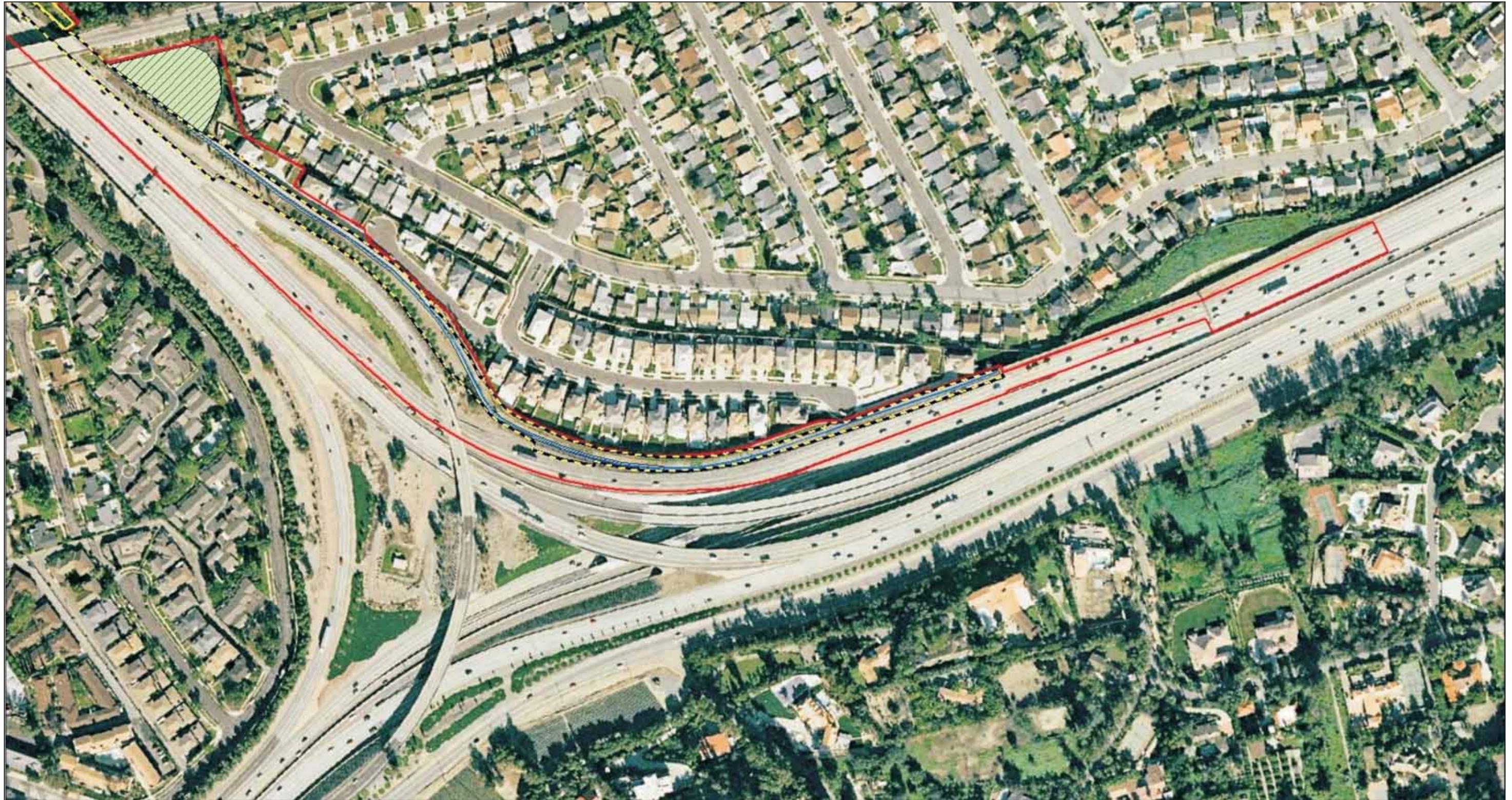
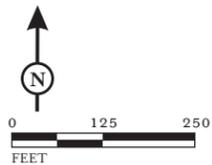


FIGURE 2.15-2  
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- Legend**
-  Presumed Wetland
  -  Temporary Construction Easement
  -  Maximum Construction Limit
  -  ACOE Jurisdiction
  -  CDFG Jurisdiction
  -  BSA



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4.55 ac are deepwater aquatic waters. Deepwater aquatic waters do not qualify as wetland waters due to the lack of hydrophytic terrestrial vegetation. Deepwater aquatic waters are recognized as having a high habitat value due to their use as a fish and wildlife resource and limited distribution in the arid west. Within the BSA, only the Santa Ana River contains deepwater aquatic habitat.

### ***CDFG Jurisdiction***

All of the areas satisfying the ACOE jurisdictional criteria for waters of the United States, as described above, are also subject to CDFG jurisdiction pursuant to Section 1602 of the California Fish and Game Code. In addition, streambed banks and adjacent riparian areas (when present) extending beyond the limits of the ACOE jurisdiction are considered subject to CDFG jurisdiction.

### ***RWQCB Jurisdiction***

Since there is no guidance to determine RWQCB jurisdictional areas, jurisdiction was determined based on the federal definition of wetlands (three-parameter) and other waters of the United States (OHWM) as recommended by the September 2004 Workplan. Therefore, the potential RWQCB jurisdictional areas are the same as those identified as jurisdictional for the ACOE.

### ***Functions and Values***

As part of the jurisdictional delineation, an analysis of the functions and values of the drainages in the project area was conducted. The functions and values are discussed in further detail below:

**Hydrologic Regime** (rated high for Santa Ana River). This function is the ability of a wetland or stream to absorb and store water belowground. The degree of this saturation is dependent on the soil composition and is affected by prior flooding events. For example, clay soils possess more pore space than sandy soils. However, the smaller pore size slows the rate at which water is absorbed and released; therefore, clay soil has a lower capacity to store water than sandy soils. The storage of water belowground allows for the fluctuation between anaerobic and aerobic conditions that benefit environmental conditions necessary for microbial cycling.

**Flood Storage and Flood Flow Modification** (rated high for Santa Ana River). This function is determined based on the ability of a wetland or stream at which the peak flow in a watershed can be attenuated during major storm events and during peak domestic flows to take in surface water that may otherwise cause flooding. This is dependent on the size of the wetland or stream, the amount of water it can hold, and

the location in the watershed. For instance, larger wetlands or streams that have a greater capacity to receive waters have a greater ability to reduce flooding. In addition, areas high in the watershed may have more ability to reduce flooding in downstream areas, but areas lower in the watershed may have greater benefits to a specific area. Vegetation, shape, and the configuration of the wetland or stream may also affect flood storage by dissipating the energy of flows during flood events.

**Sediment Retention** (rated high for Santa Ana River). Removal of sediment is the process that keeps sediments from migrating downstream. This is accomplished through the natural process of sediment retention and entrapment. This function is dependent on the sediment load being delivered by runoff into the watershed. Similar to above, the vegetation, shape, and configuration of a wetland will also affect sediment retention if water is detained for long durations, as would be the case with dense vegetation, a bowl-shaped watershed, or slow-moving water. This function would be demonstrated (i.e., high) if the turbidity of the incoming water is greater than that of the outgoing water.

**Nutrient Retention and Transformation** (rated low for Santa Ana River). Nutrient cycling consists of two variables: uptake of nutrients by plants and detritus turnover, in which nutrients are released for uptake by plants downstream. Wetland systems in general are much more productive with regard to nutrients than upland habitats. The regular availability of water associated with the wetland or stream may cause the growth of plants (nutrient uptake) and associated detritivores and generate nutrients that may be utilized by a variety of aquatic and terrestrial wildlife downstream.

Toxicant Trapping (rated low for Santa Ana River). The major processes by which wetlands remove nutrients and toxicants are as follows: (1) by trapping sediments rich in nutrients and toxicants, (2) by absorption to soils high in clay content or organic matter, and (3) through nitrification and denitrification in alternating oxic and anoxic conditions. Removal of nutrients and toxicants is closely tied to the processes that provide for sediment removal.

**Social Significance** (rated high for Santa Ana River). This is a measure of the probability that a wetland or stream will be utilized by the public because of its natural features, economic value, official status, and/or location. This includes its being utilized by the public for recreational uses, such as boating, fishing, birding, walking, and other passive recreational activities. In addition, a wetland or stream that

is utilized as an outdoor classroom, is a location for scientific study, or is near a nature center would have a higher social significance standing.

**Wildlife Habitat** (rated moderate for Santa Ana River). General habitat suitability is the ability of a wetland to provide habitat for a wide range of wildlife. Vegetation is a large component of wildlife habitat. As plant community diversity increases along with connectivity with other habitats, so does potential wildlife diversity. In addition, a variety of open water, intermittent ponding, and perennial ponding is also an important habitat element for wildlife.

**Aquatic Habitat** (rated high for Santa Ana River). The ability of a wetland or stream to support aquatic species requires that there be ample food supply, pool and riffle complexes, and sufficient soil substrate. Food supply is typically in the form of aquatic invertebrates and detrital matter from nearby vegetation. Pool and riffle complexes provide a variety of habitats for species diversity as well as habitat for breeding and rearing activities. Species diversity is directly related to the complexity of the habitat structure.

As shown in Table 2.15-2, there are eight drainages identified within the proposed project limits. However, only the Santa Ana River is listed as having high functions and values in the categories of hydrologic regime, flood storage and flood flow modification, sediment retention, social importance, and aquatic habitat. The Santa Ana River is also listed as having moderate function and value in the category of wildlife habitat.

**Table 2.15.2 Functions and Values of Drainages within the Study Area**

Drainage Number	Hydrologic Regime	Flood Storage and Flood Flow Modification	Sediment Retention	Nutrient Retention and Transformation	Toxicant Trapping	Social Significance	Wildlife Habitat	Aquatic Habitat
1	Low	Low	Low	Low	Low	Low	Low	Low
2	Low	Low	Low	Low	Low	Low	Low	Low
3	Low	Low	Low	Low	Low	Low	Low	Low
4	Low	Low	Low	Low	Low	Low	Low	Low
5	Low	Low	Low	Low	Low	Low	Low	Low
6	Low	Low	Low	Low	Low	Low	Low	Low
7 <sup>1</sup>	High	High	High	Low	Low	High	Moderate	High
8	Low	Low	Low	Low	Low	Low	Low	Low

<sup>1</sup> Santa Ana River

### 2.15.2.3 Environmental Consequences

#### **Temporary Impacts**

##### *Alternative 1 (No Build)*

The No Build Alternative does not propose any construction or other disturbance in the project area. Therefore, the No Build Alternative will result in no temporary adverse impacts related to wetlands or other waters of the United States

##### *Build Alternatives 2 and 3*

The proposed project would result in direct temporary impacts to potentially jurisdictional riverine habitat. Temporary impacts from equipment staging and construction activities would occur during the construction phase of the project. Table 2.15.3 quantifies the extent to which the project alternatives would temporarily impact ACOE and CDFG jurisdictional areas. Temporary impacts to jurisdictional areas are shown in Figure 2.15-2.

**Table 2.15.3 Temporary Impacts to CDFG and ACOE Jurisdictional Areas**

	<b>Alternative 2 (ac)</b>	<b>Alternative 3 (ac)</b>
CDFG Jurisdictional Areas	5.97	6.48
ACOE Jurisdictional Non-Wetland Waters	4.07	4.43
Potential ACOE Jurisdictional Areas (Significant nexus determination required)	N/A	N/A
<b>Total Potential ACOE Jurisdictional Areas</b>	<b>4.07</b>	<b>4.43</b>

Note: Numbers were calculated off of preliminary design numbers and are subject to change with further design and structure evaluations. The maximum envelope was used in order to assist with the impacts analysis.

ac = acres

ACOE = United States Army Corps of Engineers

CDFG = California Department of Fish and Game

As shown in Table 2.15.3, Alternative 3 would result in greater temporary impacts to CDFG and ACOE jurisdictional areas compared to Alternative 2. Alternative 2 and 3 are anticipated to result in temporary impacts to 5.97 ac and 6.48 ac of CDFG jurisdictional areas, respectively. Alternative 2 and 3 are anticipated to result in temporary impacts to 4.07 ac and 4.43 of potential ACOE jurisdictional non-wetland waters, respectively.

Since there is no public guidance on determining RWQCB jurisdictional areas, jurisdiction was determined based on the federal definition of wetlands (three-parameter) and other waters of the United States (OHWM) as recommended by the September 2004 Workplan. Therefore, the total temporary impacts to potential RWQCB jurisdictional areas are the same as those for the ACOE.

Temporary impact numbers to jurisdictional areas would most likely change when design and structure staff develops more refined plans. If these numbers change, they should reduce in size, as a large envelope was used to determine the maximum expected impacts to biological resources.

Minor short-term, temporary impacts to drainage functions and values may occur under both Build Alternatives during the construction of additional bridge piers for the widening of the SR-91 bridge over the Santa Ana River. However, with the implementation of Minimization Measures WQ-1 through WQ-5, impacts to drainage functions would be minimal. Temporary impacts to wildlife during construction would be minimized with the implementation of Measures BIO-3 through BIO-5.

### ***Permanent Impacts***

#### ***Alternative 1 (No Build)***

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative will result in no permanent adverse impacts related to wetlands or other waters of the United States.

#### ***Build Alternatives 2 and 3***

The proposed project would result in direct and indirect permanent impacts to potentially jurisdictional riverine habitat. Table 2.15.4 quantifies how much the project alternatives would permanently impact ACOE and CDFG jurisdictional areas. Permanent impacts to jurisdictional areas are shown in Figure 2.15-2.

As shown in Table 2.15.4, Alternative 3 would result in greater permanent impacts to CDFG and ACOE jurisdictional areas compared to Alternative 2. Alternative 2 and 3 are anticipated to result in direct and indirect permanent impacts to 0.37 ac and 0.86 ac of CDFG jurisdictional areas, respectively. Alternative 2 and 3 are anticipated to result in direct and indirect permanent impacts to 0.17 ac and 0.43 ac of potential ACOE jurisdictional non-wetland waters, respectively. The total permanent impacts to potential RWQCB jurisdictional areas are the same as those for the ACOE.

**Table 2.15.4 Permanent Impacts to CDFG and ACOE  
Jurisdictional Areas**

	<b>Alternative 2 (ac)</b>	<b>Alternative 3 (ac)</b>
CDFG Jurisdictional Areas	0.37	0.86
ACOE Jurisdictional Non-wetland Waters	0.13	0.29
Potential ACOE Jurisdictional Areas (Significant nexus determination required)	0.03	0.15
<b>Total Potential ACOE Jurisdictional Areas</b>	<b>0.17</b>	<b>0.43</b>

Note: Numbers were calculated using preliminary design numbers and are subject to change with further design and structure evaluations. The maximum envelope was used in order to assist with the impacts analysis.

ac = acres

ACOE = United States Army Corps of Engineers

CDFG – California Department of Fish and Game

Permanent impacts numbers to jurisdictional areas would most likely change when design and structure staff develops more refined plans. If these numbers change, they should reduce in size, as a large envelope was used to determine the maximum expected impacts to biological resources.

As discussed previously under Section 2.9, Water Quality and Stormwater Runoff, the extension of the overcrossing piers within the Santa Ana River is not expected to further impede flow or change the hydraulic conditions within the Santa Ana River. New bridge piers would be placed upstream in line with the existing piers, resulting in the existing hydraulic conditions being maintained. Since it is anticipated that both Build Alternatives would result in very minimal modifications to the Santa Ana River itself, changes to the hydrologic regime, flood storage, and flood flow functions as a result of the Build Alternatives are also considered minimal.

Areas of the proposed project located within the Santa Ana River are routinely altered to the point that vegetation is not sustainable. Since these areas are generally devoid of vegetation, nutrient uptake is low and would remain low under the proposed Build Alternatives. Therefore, this function will remain the same after construction of the Build Alternatives.

Build Alternatives 2 and 3 would result in 0.17 and 0.43 ac, respectively, of permanent impacts to riverine habitat. The removal of riverine habitat will decrease the ability of this area to retain and transform nutrients and decrease the capacity to trap toxics and sediments. However, the amount of habitat to be affected by the proposed project is very small compared to the total project area. Therefore, with the

implementation of Minimization Measures BIO-1 and BIO-2, the proposed project will not change the current values for the nutrient retention and transformation and sediment retention functions of the Santa Ana River.

The portion of the Santa Ana River within the proposed project limits does not currently provide any opportunity for recreation or for an outdoor classroom or scientific study because it is illegal for the public to trespass on freeway rights-of-way. Therefore, no change in value to the social significance function of the Santa Ana River is anticipated.

The Santa Ana River provides moderate function for wildlife species and high function for some aquatic species. There is no permanent change in function or value to wildlife or aquatic species anticipated under the Build Alternatives.

#### **2.15.2.4 Avoidance, Minimization, and/or Mitigation Measures**

In addition to minimization measure BIO-1, presented previously in Section 2.15.1, Natural Communities, the following mitigation measure is required for impacts to jurisdictional riverine habitats:

**BIO-2** The existing riverine habitat falls under the regulatory jurisdiction of the United States Army Corps of Engineers (ACOE) pursuant to Section 404 of the Clean Water Act (CWA) and the California Department of Fish and Game (CDFG) pursuant to Section 1600 of the California Fish and Game Code. Compensatory mitigation for riverine habitat will be required for ACOE Section 404 and CDFG Section 1600 permitting. Riverine habitat subject to ACOE and CDFG jurisdiction may be mitigated at a minimum mitigation-to-impact ratio up to 3:1 for permanent impacts and 1:1 for temporary impacts. Mitigation may involve in-lieu fee transfer to an organization that manages and restores similar riverine habitat. Final details for compensatory mitigation will be evaluated through coordination between the Department and the resource agencies.

### **2.15.3 Plant Species**

#### **2.15.3.1 Regulatory Setting**

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share 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 (FESA) and/or the California Endangered Species Act (CESA).

This section of the document discusses all the other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at United States Code 16 (USC), Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, Public Resources Code, Sections 2100–21177.

### **2.15.3.2 Affected Environment**

This section is based on the Natural Environment Study (NES) (May 2010).

A total of 2 of 20 special-status plant species with potential of occurring within the BSA are federal- and/or State-listed as endangered, threatened, or candidate species: Braunton’s milk-vetch and the Santa Ana River woollystar. However, suitable habitat for these species is absent from the BSA. The absence of suitable habitat is largely due to ongoing management activities within the Santa Ana River and urbanization within the BSA. These two species were confirmed absent through surveys conducted during the appropriate blooming season within the BSA.

### **2.15.3.3 Environmental Consequences**

As stated previously, suitable habitat for the Braunton’s milk-vetch and the Santa Ana River woollystar and all other potentially occurring special-status plant species is absent from the BSA. Therefore, no temporary or permanent impacts to plant species are anticipated as a result of the proposed project.

### **2.15.3.4 Avoidance, Minimization, and/or Mitigation Measures**

No impacts to the plant species are anticipated as a result of the proposed project. Therefore, no mitigation measures are required.

## **2.15.4 Animal Species**

### **2.15.4.1 Regulatory Setting**

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the California Department of Fish and Game (CDFG) 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. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

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

State laws and regulations pertaining to wildlife include the following:

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

### **2.15.4.2 Affected Environment**

This section is based on the Natural Environment Study (NES) (May 2010). Special-status wildlife with the potential to occur in the Biological Study Area (BSA) are discussed in this section.

A Cooper's hawk was observed (in flight) within the BSA during biological resource surveys conducted in 2009. However, the BSA does not contain any potential nesting habitat for this species (oak woodland or natural riparian/riverine communities).

Great blue heron have been recorded nesting within the BSA. Great blue heron were found foraging within the temporary impact area of the project, but no nesting sites were located within the proposed impact area during biological resource surveys conducted in 2009.

Special-status bridge and crevice dwelling animal species (i.e. bats) with the potential to occur in the BSA include Western mastiff bat and Yuma myotis. No bat species

were directly observed during the Bat habitat suitability survey. A small amount of guano was detected within the BSA, under the Santa Ana River Bridge. It was determined that some suitable roosting exists within the BSA for all of the special-status bat species.

### **2.15.4.3 Environmental Consequences**

#### ***Temporary Impacts***

##### *Alternative 1 (No Build)*

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative would not result in temporary adverse impacts related to special-status animal species.

##### *Build Alternatives 2 and 3*

The proposed project is not expected to directly or indirectly impact Cooper's hawk or great blue heron. No natural communities and/or resources would be impacted that these species are dependent upon. The BSA may presently serve as a foraging area for these species; however, the proposed project would not have a measurable temporary impact to the foraging area.

Impacts to bat species would include temporary indirect disturbance (such as noise, dust, night lighting, and human encroachment) during construction. In addition, construction could temporarily impede access to roost sites (existing and future) in the crevices of bridges, culverts, and overhead structures. Only a small portion of roosting habitat may be temporarily altered by the proposed project.

Raptors and other birds protected by the MBTA may nest in existing trees and shrubs within and adjacent to the BSA. Impacts to these species can occur as a result of direct removal of nests (e.g., during vegetation clearing) or causing nest failure by excessive disturbance of the nesting birds (e.g., from excessive noise and disruption from increased human activities). Temporary impacts to birds nesting within or adjacent to the BSA may occur if construction, particularly vegetation clearing, occurs during the nesting season.

#### ***Permanent Impacts***

##### *Alternative 1 (No Build)*

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative will not result in permanent adverse impacts related to special-status animal species.

### **Build Alternatives 2 and 3**

The proposed project is not expected to directly or indirectly impact Cooper's hawk or great blue heron. No natural communities and/or resources would be impacted that these species are dependent upon. The BSA may presently serve as a foraging area for these species; however, the proposed project would not have a measurable permanent impact to the foraging area.

The widening of the Santa Ana River bridge would likely increase future potential bat roosting habitat. Because of this, the project is not expected to substantially impact the bats' long-term use of the structures.

#### **2.15.4.4 Avoidance, Minimization, and/or Mitigation Measures**

In addition to measure BIO-1, presented previously in Section 2.15.1, Natural Communities, the following minimization measures would reduce potential impacts to special-status animal species:

**BIO-3** In order to avoid impacts to nesting birds, any native vegetation or tree (native or exotic) trimming activities will occur outside of the nesting bird season (February 15–August 31). In addition, construction activities for the Santa Ana River Bridge will occur outside of the nesting bird season (February 15–August 31). In the event that bridge construction is necessary during the nesting season, a qualified biologist will conduct a preconstruction survey to identify the locations of nests. Should nesting birds be found, an exclusionary buffer will be established by the biologist. This buffer should be clearly marked in the field by construction personnel under guidance of the biologist, and construction work will not be conducted within this zone until the biologist determines that the young have fledged or the nest is no longer active. If construction is anticipated during the nesting season, it is suggested to conduct an active mud nest removal plan on the east side of the bridge that will be directly impacted by the project activities prior to nesting season.

**BIO-4** A qualified bat biologist shall perform a preconstruction survey since bat roosts can change seasonally. The surveys shall include a combination of structure inspection, exit counts, and acoustic surveys for purposes of species identification.

**BIO-5** If preconstruction surveys find that bats are utilizing the bridge structure, the following measures should be followed: In order to prevent impacts to bridge and crevice-nesting bats, all bridgework shall be scheduled between September 1 and November 30 to avoid hibernating bats and the maternity season. If this is not feasible, bat exclusion devices will need to be installed under the supervision of a qualified biologist. Such exclusion efforts must be continued to keep the structures free of bats until the completion of construction. All bat exclusion techniques shall be coordinated among the District Biologist and the resource agencies.

## **2.15.5 Invasive Species**

### **2.15.5.1 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.”

### **2.15.5.2 Affected Environment**

This section is based on the Natural Environment Study (NES) (May 2010).

The California Invasive Plant Council (Cal-IPC) 2006 Invasive Plant Inventory and 2007 Invasive Plant Inventory Update highlights nonnative plants that are serious problems in wildlands (natural areas that support native ecosystems, including national, State, and local parks; ecological reserves; wildlife areas; National Forests; Bureau of Land Management lands; etc.). The inventory is based on information submitted by members, land managers, botanists, and researchers throughout the State as well as published sources. The inventory categorizes plants as High, Moderate, or Limited based on the species’ negative ecological impact in California. Plants categorized as High have severe ecological impacts. Plants categorized as Moderate have substantial and apparent, but not severe, ecological impacts. Plants categorized as Limited are invasive, but their ecological impacts are minor on a statewide level.

A total of 26 exotic plant species occurring in California Invasive Plant Council’s (Cal IPC’s) California Invasive Plant Inventory were identified in the BSA. Of these

species, there are 4 with an overall high rating, 10 with a moderate rating, and 12 with a limited rating. Species with a high rating identified within the BSA are: sweet fennel (*Foeniculum vulgare*), giant reed (*Arundo donax*), foxtail chess (*Bromus madritensis*), and Pampas grass (*Cortaderia selloana*). These observations should not be considered all-inclusive.

### **2.15.5.3 Environmental Consequences**

#### ***Temporary Impacts***

##### *Alternative 1 (No Build)*

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative would result in no temporary adverse impacts related to invasive species.

##### *Build Alternatives 2 and 3*

Impacts related to invasive species are considered permanent impacts because the introduction of invasive species into previously undisturbed areas would result in permanent impacts to the habitat. Therefore, impacts related to invasive species as a result of the proposed project are described below under permanent impacts.

#### ***Permanent Impacts***

##### *Alternative 1 (No Build)*

The No Build Alternative proposes no construction or other disturbance in the project area. Therefore, the No Build Alternative would result in no permanent adverse impacts related to invasive species.

##### *Build Alternatives 2 and 3*

The implementation of the Build Alternative has the potential to spread invasive species by the entering and exiting of construction equipment contaminated by invasives, the inclusion of invasive species in seed mixtures and mulch, and the improper removal and disposal of invasive species so that seed is spread along the highway. In addition, construction may indirectly impact riverine habitats permanently through enhancing germination and proliferation of nonnative invasive plant species.

### **2.15.5.4 Avoidance, Minimization, and/or Mitigation Measures**

The following avoidance and minimization measures will be implemented to avoid and minimize the spread of invasive species from spreading from or into the project area:

- BIO-6** In compliance with Executive Order (EO) 13112, invasive species will be removed from the project work area and controlled during construction.
- BIO-7** Inspection and cleaning of construction equipment will be performed to minimize the importation of nonnative plant material, and eradication strategies (i.e., weed abatement programs) will be employed should an invasion occur during construction.
- BIO-8** Graded areas will not be revegetated with plant species listed in California Invasive Plant Council's (Cal-IPC's) California Invasive Plant Inventory with a High or Moderate rating.

## **2.16 Cumulative Impacts**

### **2.16.1 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 a period of 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 consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines.

### **2.16.2 Methodology**

Cumulative impacts were identified by comparing the impacts of the proposed project and other past, current, or proposed actions in the area to establish whether, in the aggregate, they could result in cumulative environmental impacts. Both direct and indirect impacts are assessed. The cumulative effects analysis focuses on those issues and resources that would be affected by the aggregation of stress factors on the environment and does not address in detail those topics that would not have additional environmental effects from the cumulative condition. The analysis provided in this section considered the effects of other projects and the Build Alternatives in assessing whether a particular environmental parameter would experience cumulative adverse impacts. Specific geographic boundaries for cumulative effects are determined for each environmental topic analyzed and may vary accordingly.

Future actions anticipated to occur include further growth within the City of Anaheim (City). This growth would require continued expansion of supporting infrastructure such as roadways, commercial uses, public services, and utilities. The anticipated growth is reflected in the regionally adopted growth projections and is planned for in the City General Plan.

The following eight steps serve as guidelines for identifying and assessing cumulative impacts and are based on the Caltrans *Guidance for Preparers of Cumulative Impact Analysis Approach and Guidance* (June 30, 2005).<sup>1</sup>

- Identify the resources to consider in the cumulative impact analysis by gathering input from knowledgeable individuals and reliable information sources. This process is initiated during project scoping and continues throughout the California Environmental Quality Act (CEQA) analysis.
- Define the geographic boundary or Resource Study Area (RSA) for each resource to be addressed in the cumulative impact analysis.
- Describe the current health and historical context of each resource.
- Identify the direct and indirect impacts of the proposed project that might contribute to a cumulative impact on the identified resources.
- Identify a set of other current and reasonably foreseeable future actions or projects and their associated environmental impacts to include in the cumulative impact analysis.
- Assess cumulative impacts.
- Report the results of the cumulative impact analysis.
- Assess the need for mitigation and/or recommendations for actions by other agencies to address a cumulative impact.

### **2.16.3 Projects Contributing to Future Cumulative Impacts**

Table 2.16.1 identifies the major future development and transportation projects anticipated within this portion of the City and are considered in the cumulative analysis. Additionally, projects being undertaken on the State highway system have also been identified. Projects that are speculative in nature were not considered in this cumulative analysis. The projects are in varied degrees of planning, design, and construction. The scope of such projects may change during the planning

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<sup>1</sup> [http://www.dot.ca.gov/ser/cumulative\\_guidance/approach.htm](http://www.dot.ca.gov/ser/cumulative_guidance/approach.htm); accessed May 2010.

**Table 2.16.1 Cumulative Projects**

Name	Jurisdiction	Proposed Use	Status
<b>Transportation Projects</b>			
SR-91 Widening Project (SR-55 to SR-241)	Caltrans	Addition of one general-purpose lane	Final design
SR-91 Express Lanes to the SR-241 toll road	Caltrans	Addition of direct connectors	Feasibility Study; 10-plus years from construction
SR-91 Eastbound (SR-241 to SR-71)	Caltrans	Addition of one general-purpose lane	Under construction; construction completion anticipated in 2012
SR-91 (Lakeview Avenue overcrossing to the Orange/San Bernardino/Riverside County Line)	Caltrans	Pavement rehabilitation	Completed in 2007
SR-91 (SR-241 to Pierce Street)	Caltrans	Construct one general-purpose lane or one general-purpose lane and one express lane	Project Report and Environmental Document; 10 to 15 years from construction
Tustin Avenue Widening Project (SR-91 to La Palma)	City of Anaheim	Widening of Tustin Avenue on the northerly side of the SR-91/Tustin Avenue interchange. Improvement include addition of a right-turn lane at the westbound off-ramp terminus, realignment of Tustin Avenue, and widening of both sides of Tustin Avenue from the SR-91/Tustin Avenue interchange to the intersection of Tustin Avenue and La Palma.	Design phase
<b>Development Projects</b>			
Kaiser Permanente Hospital Campus		<p>A new 27-acre (ac) Kaiser Permanente Hospital Campus located at 3400–3450 La Palma Avenue within the Canyon Business Center Development will replace the existing Kaiser Foundation Hospital located at 441 Lakeview Avenue.</p> <p>Phase I includes a four-story, 118,500-square-foot (sf) medical office building that has been completed and is occupied.</p> <p>Phase II is expected to open in 2012 and will include a six-story, 433,000 sf hospital with 200 beds, a six-story parking structure (681,102 sf), and a 44,694 sf central utility plant. An additional 180,000 sf medical office building is expected to be completed by 2014.</p> <p>Phase III is expected to be completed in 2020 and will include two medical office buildings (100,000 sf and 120,000 sf), a</p>	<p>Phase I of the project has been completed.</p> <p>Phase II construction is underway, and the hospital and parking structure are expected to be completed by 2012. The additional office building is expected to be completed by 2014.</p>

**Table 2.16.1 Cumulative Projects**

Name	Jurisdiction	Proposed Use	Status
		six-story, 200,000 sf extension of the hospital with 160 additional beds, and a six-story parking structure. Total build out of this facility is expected to be approximately 1.2 million sf.	Phase III may be completed in 2020 depending on need and available funding.
Pacificcenter		Redevelopment of the Pacificcenter complex that includes the intensification of existing office and retail developments located at the southwest corner of Tustin Avenue and La Palma Avenue. The project consists of mixed uses, with an office building, residential units, retail uses, the expansion of the existing Anaheim Metrolink Canyon train station and an associated parking structure.	Design phase
Anaheim Canyon Metrolink Station		Improvements to the existing Anaheim Canyon Metrolink train station, located in the southwest corner of Tustin Avenue and La Palma Avenue, which will include an expanded platform, a new plaza area under the existing tracks, and a 600-foot pedestrian connection from the station to the new Kaiser Permanente Hospital Campus.	Design phase
The Crossing		A 5.2 ac, 312-unit, condominium project with 39 live/work units located at 3520–3570 East La Palma Avenue.	Under construction
Boeing Site		Redevelopment of 60 ac of a 100 ac site located at 3370 East Miraloma. The redevelopment would refurbish the existing offices and industrial buildings and construct new retail stores.	Design phase
Concourse Bowling		Remodeling of the existing bowling facility located on a 2.7 ac parcel. The remodeling will include an expanded management office, outdoor patio, relocated telecommunications tower, and two freeway-oriented business identification signs.	Approved by the Anaheim City Council on March 8, 2008.

Caltrans = California Department of Transportation  
 SR-55 = State Route 55  
 SR-71 = State Route 71  
 SR-91 = State Route 91  
 SR-241 = State Route 241

phase; consequently, their environmental impacts may be altered. Each of these projects would require separate consultation with resource agencies for project impacts.

### 2.16.4 Cumulative Impacts

The following discussion of potential cumulative impacts is presented by environmental resource area. No cumulative impact discussion is provided for the No

Build Alternative because the No Build Alternative would not result in either temporary or permanent changes to the environment that could contribute to cumulative effects.

#### **2.16.4.1 Land Use**

It is anticipated that future development would be implemented in a manner consistent with adopted land use, transportation, and resource plans. The evaluation of plan consistency is considered a project-related evaluation and is discussed in Section 2.1, Land Use. The state, regional, and local plans reviewed for this evaluation provide a broader planning context for the Build Alternatives. The Build Alternatives would not result in cumulative land use impacts.

#### **2.16.4.2 Growth**

Growth in the City is forecast based on land use plans, economic conditions, and other factors. Existing traffic congestion in the project area is considerable and would continue to worsen in the future without implementation of the Build Alternatives. As discussed in Section 2.2, Growth, the Build Alternatives would accommodate forecast population growth and traffic increases. However, because the Build Alternatives would not substantially increase the existing capacity of State Route 55 (SR-55), State Route 91 (SR-91), or Tustin Avenue, they would not influence the amount, timing, or location of growth in the area. Therefore, the Build Alternatives would not result in growth-related effects.

#### **2.16.4.3 Community Impacts (Community Character and Cohesion)**

As discussed in Section 2.3.1, Community Character and Cohesion, the Build Alternatives would not physically divide an established community, open any new areas to development, or change the accessibility of the areas surrounding the project site. In addition, the Build Alternatives would provide long-term benefits to the local community by relieving congestion and improving access and circulation. Therefore, construction and operation of the Build Alternatives would not permanently affect the character or cohesion of the study area census tracts, the City, or the County of Orange (County), or result in cumulative impacts to the community character or cohesion.

#### **2.16.4.4 Community Impacts (Relocations)**

As discussed in Section 2.3.2, Relocations, the Build Alternatives would require temporary construction easements, partial acquisitions, and permanent easements. However, no relocations or displacements of residences or businesses are anticipated

under the Build Alternatives. Therefore, the proposed project would not result in cumulative impacts related to relocations.

#### **2.16.4.5 Community Impacts (Environmental Justice)**

As discussed in Section 2.3.3, Environmental Justice, the Build Alternatives would not cause disproportionately high and adverse effects on any minority or low-income populations per Executive Order (EO) 12898 regarding Environmental Justice. Therefore, the Build Alternatives would not result in cumulative impacts to Environmental Justice populations.

#### **2.16.4.6 Farmlands/Timberlands**

There are no farmlands or timberlands within or adjacent to the disturbance limits of the proposed project. No farmlands would be temporarily or permanently impacted by the Build Alternatives.

#### **2.16.4.7 Utilities/Emergency Services**

As discussed in Section 2.4, Utilities and Emergency Services, the Build Alternatives would not result in adverse effects to utilities and emergency services, except for short-term effects during construction. The effects of other transportation and public infrastructure projects on utilities and emergency services would be assessed as part of the environmental review of those projects. However, given that these projects generally improve the circulation in their respective project areas, emergency services would benefit from improved access and circulation. Therefore, the Build Alternatives and the other transportation and public infrastructure projects would not contribute to a cumulative impact on utilities or emergency services.

#### **2.16.4.8 Traffic and Circulation**

As discussed in Section 2.5, Traffic and Transportation/ Pedestrian and Bicycle Facilities, the Build Alternatives would not result in adverse effects to traffic circulation in the study area, except for short-term effects during construction. The Build Alternatives would have a beneficial effect by reducing congestion and improving the level of service (LOS) on SR-91 within the study area. The analysis of future traffic conditions is a cumulative analysis because it considers traffic generated by future planned land uses and the effect of future planned transportation improvements. Therefore, the traffic congestion in the project area would improve, and the Build Alternatives would not contribute to a cumulative impact on traffic and circulation.

#### **2.16.4.9 Visual Impacts**

The Resource Study Area (RSA) for visual and aesthetics is the project segment of SR-55, SR-91, and Tustin Avenue and the surrounding properties since these areas have views to and from the project site. Historically, visual resources in the cumulative study area have been characterized by the conversion of agricultural and ranchland to residential, commercial, and industrial uses from the 1960s to the present. The RSA contains several existing sound walls/noise barriers and other walls that restrict foreground views. Currently, the character of this resource continues to be an urban setting due to the existing highway and interchanges and residential, commercial, light industrial, and recreational land uses.

##### *Direct Impacts*

Overall, the visual effect of the Build Alternatives and other projects in the vicinity would be temporary in nature and would not have an adverse cumulative effect. The RSA is not within a visually sensitive setting due to the urbanized condition of the area. Cumulative and development transportation projects would be urban in nature, and cumulative development projects would be evaluated by the appropriate reviewing agency to ensure that they are visually compatible with the urban setting and surrounding developments. As discussed above, the Build Alternatives would not substantially change the existing views or the existing urban setting in the RSA, and the changes would primarily be visible only to motorists traveling along SR-91. The Build Alternatives' minor contribution to cumulative impacts would be reduced through implementation of aesthetic treatments such as vegetation and design enhancements. Therefore, implementation of the proposed Build Alternatives would not contribute to substantial temporary or permanent cumulative impacts to visual resources.

##### *Indirect Impacts*

Visual Impacts are direct in nature. No indirect visual impacts would occur .

#### **2.16.4.10 Cultural Resources**

As discussed in Section 2.7, Cultural Resources, no cultural resources were identified within or immediately adjacent to the Project Area Limits (PAL). Although considered unlikely, there is a potential to encounter unknown buried cultural materials or human remains during construction of the Build Alternatives. The effects of other cumulative projects on cultural resources would be evaluated as part of the environmental review process for those projects. The avoidance measure with respect to unknown subsurface archaeological resources is applicable to all projects that involve excavation in potentially sensitive areas. Therefore, the project's impacts to

cultural resources are not cumulatively considerable, and no cumulative impacts to cultural resources would occur.

#### **2.16.4.11 Hydrology and Floodplains**

The RSA for hydrology and floodplains is the 100-year floodplain of Reach 2 of the Santa Ana River. Within the project area, the SR-91 bridge crosses Reach 2 of the Santa Ana River above the 100-year floodplain. At this location, the Santa Ana River channel is manufactured and has an earthen bottom with little or no vegetation adjacent to the channel. The 100-year flood discharge is contained within the Santa Ana River channel. The existing Santa Ana River channel is capable of conveying the 100-year flood with approximately 8.4 ft of freeboard (i.e., the distance between the 100-year flood elevation and the SR-91 bridge over the Santa Ana River).

##### *Direct Impacts*

Cumulative land use and transportation projects would comply with the applicable City and County safety policies to reduce flooding and ensure that the storm drain systems have sufficient capacity to accommodate any increase in storm flows due to increased impervious surfaces and runoff. Any projects altering the 100-year floodplains would be required to obtain a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) from the Federal Emergency Management Agency (FEMA) in order to modify the effective Flood Insurance Rate Map (FIRM), or Flood Boundary and Floodway Map, or both.

The proposed project would only result in a minor (0.29 ft) change to the Santa Ana 100-year floodplain, and other cumulative projects would be required to comply with City and County regulations and policies that regulate flooding and floodplain encroachments. In addition, the proposed project would not substantially change the capacity of the Santa Ana River channel to carry water, and the 100-year flood would continue to be contained within the Santa Ana River channel. Therefore, the project contribution to cumulative floodplain impacts would not be considerable.

##### *Indirect Impacts*

The Build Alternatives would not result in flood-related risks to life or property. Treatment Best Management Practices (BMPs) would be implemented during operation of the proposed project to reduce impacts to water quality and beneficial water resource values. Cumulative land use and transportation projects would be reviewed by the local jurisdiction or agency to ensure that they do not pose a risk to life or property. In addition, these projects would be required to implement BMPs to

prevent adverse impacts to water quality. Therefore, the project contribution to indirect cumulative floodplain impacts would not be considerable.

#### **2.16.4.12 Water Quality and Storm Water Runoff**

The RSA for water quality and storm water runoff is the Santa Ana Narrows Subwatershed of the Lower Santa Ana River Watershed. The project area crosses Reach 2 of the Santa Ana River between the SR-91/Tustin Avenue interchange and the SR-91/SR-55 junction. The Santa Ana River, Reach 2, is defined as the length of the river from 17th Street in Santa Ana to the Prado Dam. Within the project area, runoff from SR-91 discharges into drainage inlets, which discharge to the Santa Ana River, Reach 2, via various culverts.

Reach 2 of the Santa Ana River is not listed as impaired on the 2006 Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments. In addition, there are no existing or proposed Total Maximum Daily Loads (TMDLs) for Reach 2 of the Santa Ana River.

#### *Direct Impacts*

The existing trend of urbanization of the Santa Ana Narrows Subwatershed of the Lower Santa Ana River Watershed is projected to continue. The continued conversion of undeveloped land to transportation, commercial/industrial, or residential uses would result in hydromodification and increased loading of pollutants into surface waters and indirectly into groundwater. It would also introduce new sources of pollutants associated with the new land uses. Land use changes can result in increased pollutant loading.

To counteract the impacts associated with increased development, each project must undergo review by the Lead Agency for compliance with NPDES permits for construction activities, groundwater dewatering, and project operations, as well as compliance with local urban runoff ordinances. For projects within Department jurisdiction, this includes compliance with the Storm Water Management Plan (SWMP) and any local requirements of the Santa Ana Regional Water Quality Control Board (RWQCB). For the other reasonably foreseeable projects, this includes compliance with the Orange County Water Quality Management Plan (WQMP), as specified in local ordinances. BMPs must be employed in site design to reduce sources of pollutants and to treat storm water runoff.

The purpose of the NPDES permit program is to protect and restore the beneficial uses of receiving waters. Compliance with the NPDES program, based on land use

and pollutants of concern, is considered sufficient to minimize impacts to water quality. Because the Build Alternatives involve improvements to an existing freeway facility and include treatment measures that currently do not exist, the project would not contribute considerably to cumulative direct water quality impacts.

#### *Indirect Impacts*

Because the treatment of storm water would reduce impacts to downstream waters and aquatic species, indirect cumulative impacts are not anticipated.

#### **2.16.4.13 Geology/Soils/Seismicity/Topography**

As discussed in Section 2.10, Geology, Soils, Seismicity, and Topography, any adverse effects of the Build Alternatives to geology, soils, seismicity, and topography are localized and limited to the grading limits of the project. While other projects would impact the geology at their project sites, the impacts would be localized and not impact regional geology; therefore, the Build Alternatives would not contribute to cumulative impacts to geology, soil, seismicity, or topography.

#### **2.16.4.14 Paleontology**

The RSA for paleontology is the Peninsular Range Geomorphic Province, a 900 mi (1,450 kilometer [km]) long northwest-southeast-trending structural block that extends from the tip of Baja California, Mexico, to the Transverse Ranges in Southern California and includes the Los Angeles Basin. The total width of the province is approximately 225 mi (362 km), with a maximum landbound width of 65 mi (105 km). This region is characterized by a series of mountain ranges separated by northwest-trending valleys subparallel to faults branching from the San Andreas fault. It contains extensive pre-Cretaceous (more than 65 million years ago) igneous and metamorphic rocks covered by limited exposures of both pre- and post-Cretaceous sedimentary deposits.

The surface of the project area contains three types of sediments comprised of two types of native alluvium from the late Pleistocene to Holocene and artificial (engineered) fill. Within the subsurface, sediments from the middle to late Pleistocene may also be encountered. The surficial sediments do not have the potential to contain fossils. However, middle to late Pleistocene sediments in the subsurface do have the potential to contain significant nonrenewable paleontological resources that may be encountered if excavation extends deeper than approximately 8 feet (ft) below ground surface (bgs).

### *Direct Impacts*

All the reasonably foreseeable projects with deep excavation into Pleistocene sediments have the potential to result in adverse direct impacts to paleontological resources. The Build Alternatives are required to implement a PMP, which includes monitoring and recovery of paleontological resources that are found during project construction. A PMP would be required for every project with high-sensitivity sediments that is subject to California Department of Transportation (Department) oversight. For other projects, implementation of and adherence to a PMP would be required to minimize impacts to resources within high-sensitivity sediments. Because the Build Alternatives include this requirement, this project's contribution to cumulative paleontological resources impacts would not be considerable.

### *Indirect Impacts*

No indirect cumulative impacts are associated with paleontological resources.

#### **2.16.4.15 Hazardous Waste and Materials**

As discussed in Section 2.12, Hazardous Waste and Materials, implementation of the Build Alternatives would not result in a substantial permanent adverse impact related to hazardous waste and materials. Future land use and transportation projects would comply with applicable City Hazardous Waste Management Plans, ordinances, and State regulations related to hazardous materials, which would ensure that there would be no adverse hazardous material impacts resulting from future development in the City. Therefore, the project would not contribute to cumulative hazardous waste and materials impacts.

#### **2.16.4.16 Air Quality**

The air quality analysis provided in Section 2.13, Air Quality, is a cumulative analysis because it considers the emissions of traffic generated by future planned land uses and the effects of other future planned transportation improvements. This analysis determined that the Build Alternatives would not contribute to an adverse cumulative impact on air quality in the project area.

#### **2.16.4.17 Noise**

As discussed in Section 2.14, Noise, the Build Alternatives would not generate long-term, groundborne vibration impacts and therefore would not contribute to cumulative groundborne vibration. The contribution of the Build Alternatives to long-term noise impacts is not substantial and would not result in a significant cumulative noise impact.

#### **2.16.4.18 Biological Resources (Natural Communities)**

Because riverine habitat is the only natural community of special concern in the Biological Study Area (BSA) for the proposed project, the RSA for cumulative impacts to natural communities is Reach 2 of the Santa Ana River. The Santa Ana River is a natural feature that could aid in wildlife movement. This may be the only feature that some local wildlife species would have the potential to use in order to obtain food and water and travel more easily within this heavily developed urban area.

##### ***Direct Impacts***

Similar to the proposed project, impacts associated with reasonably foreseeable projects would include temporary loss of natural community habitat due to construction access and staging such as trimming, pruning, ground vegetation disturbance, and stream crossings. Permanent impacts would constitute habitat removal for replacement with structures or other landscape-altering features. The reasonably foreseeable projects would likely require removal of riparian/riverine and possibly other sensitive habitats. Habitat impacts of these projects would be mitigated through restoration/enhancement/replacement.

Because the project is limited to the widening of an existing freeway, it is not expected to have substantial impacts to wildlife movement compared to current conditions. Reasonably foreseeable projects have the potential to adversely impact wildlife movement through direct or indirect impacts to existing wildlife corridors such as obstruction, noise, lighting, or proximity to human activity. Each project will be required to evaluate potential impacts to wildlife movement and to determine the avoidance, minimization, or mitigation measures that are necessary to address potential impacts.

Given that the project's impacts are limited and would be addressed through compensatory mitigation, the project's contribution to cumulative impacts to natural communities, when considered in light of other cumulative projects, would not be considerable.

##### ***Indirect Impacts***

Indirect cumulative impacts include construction-related impacts such as dust, potential fuel spills from construction equipment, possible night lighting during construction, and activities of equipment or personnel outside designated construction areas, as well as operational impacts such as impacts on adjacent habitats caused by storm water runoff, traffic, and litter. Construction activities from cumulative projects may indirectly impact habitats permanently through shading, enhancing germination,

and proliferation of nonnative invasive plant species. Other development and transportation projects would include measures to reduce these impacts. These measures would include implementations of Construction and Treatment BMPs and standard measures for control of dust and invasive species. Because the proposed project includes these measures, the project contribution to cumulative indirect impacts to natural communities would not be considerable.

#### **2.16.4.19 Biological Resources (Wetlands and Other Waters)**

The RSA for wetlands and other waters is the the Reach 2 of the Santa Ana River and drainages tributary to Reach 2 of the Santa Ana River. The Santa Ana River is a relatively permanent water and is considered jurisdictional by ACOE, CDFG, and RWQCB.

##### ***Direct Impacts***

Cumulative impacts to wetlands and other waters would occur if the Build Alternatives, in conjunction with other related projects, result in substantial impacts to these resource areas. The existing condition of this resource is relatively low quality due to annual maintenance activities with the watershed at this location of the Santa Ana River. The ACOE, RWQCB, and CDFG would have to issue permits for the relevant related individual projects, and the permits could be subject to conditions. Projects would be required to mitigate for impacts to wetlands and other waters through habitat replacement or enhancement. The application of measures to avoid or minimize harm and compliance with resource agency permit conditions for related projects would also substantially reduce impacts. Therefore, issuance of the respective permits and associated conditions by the jurisdictional agencies for these projects would ensure that substantial cumulative impacts would be limited. In addition, given the urbanized nature of the project area and application of regulatory and permitting requirements, the contribution of the Build Alternatives to cumulative wetlands impacts and other waters is not considerable.

##### ***Indirect Impacts***

Indirect cumulative impacts to wetlands and other waters would be the same as those discussed above for riverine communities in Section 2.16.5.5, Biological Resources (Natural Communities).

#### **2.16.4.20 Biological Resources (Plant Species)**

No sensitive plant species would be temporarily or permanently impacted by the Build Alternatives.

#### **2.16.4.21 Biological Resources (Animal Species)**

As discussed in Section 2.15.3, Animal Species, the Build Alternatives would not result in adverse effects to animal species, except for potential short-term effects to migratory bird and bats during construction. The proposed project includes measures to avoid active bird nests and bat roosts. Because the animal species impacts associated with the project would be minimized through application of measures to protect habitat and species, the project's contribution to cumulative impacts to animal species is not considerable.

#### **2.16.4.22 Biological Resources (Threatened and Endangered Species)**

No threatened or endangered species would be temporarily or permanently impacted by the Build Alternatives.

#### **2.16.4.23 Biological Resources (Invasive Species)**

The Build Alternatives would not substantially increase the potential for the spread of invasive species. Compliance with standard procedures would be sufficient to address this potential impact.

#### **2.16.4.24 Climate Change**

An individual project does not generate enough greenhouse gas (GHG) emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. Therefore, the analysis in Section 2.17, Climate Change, is a cumulative analysis. The proposed project would not generate new vehicular traffic trips since it would not construct new homes or businesses. The Build Alternatives would reduce the vehicle emissions within the region and would not contribute substantially to regional vehicle GHG emissions. Therefore, the Build Alternatives would not contribute to an adverse cumulative impact related to climate change.

#### **2.16.5 Avoidance, Minimization, and/or Mitigation Measures**

No measures beyond those identified in Sections 2.1 through 2.15 are required to address the Build Alternatives' contribution to cumulative impacts. Specific measures to minimize harm are identified in the other sections of Chapter 2 of this Initial Study for each environmental concern analyzed. These measures address both temporary as well as permanent impacts.

## 2.17 Climate Change

Neither EPA nor FHWA has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA'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 will facilitate decision-making and improve efficiency at the program level, and will 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.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA 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.

### 2.17.1 Regulatory Setting

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to GHG emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), tetrafluoromethane (CF<sub>4</sub>), hexafluoroethane (C<sub>2</sub>F<sub>6</sub>), sulfur hexafluoride (SF<sub>6</sub>), HFC-23 (fluoroform), HFC-134a (s,s,s,2-tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of AB 1493, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the State level. AB 1493 requires the ARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were

designed to apply to automobiles and light trucks beginning with the 2009 model year. To enact these standards, however, California needed a waiver from the EPA. The waiver was denied by the EPA in December 2007 (see *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011). However, on January 26, 2009, it was announced that the EPA would reconsider that decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks, which will take effect in 2012. On June 30, 2009, the EPA granted California the waiver. California is expected to enforce its standards from 2009 through 2011 and then look to the federal government to implement equivalent standards from 2012 through 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The State is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 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 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan, which 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 AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, 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.

Climate change and GHG reduction are also concerns at the federal level; however, at this time, no federal legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the EPA to regulate GHG as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 (2007)). The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases-- CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and SF<sub>6</sub> --in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds 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 which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.<sup>1</sup>

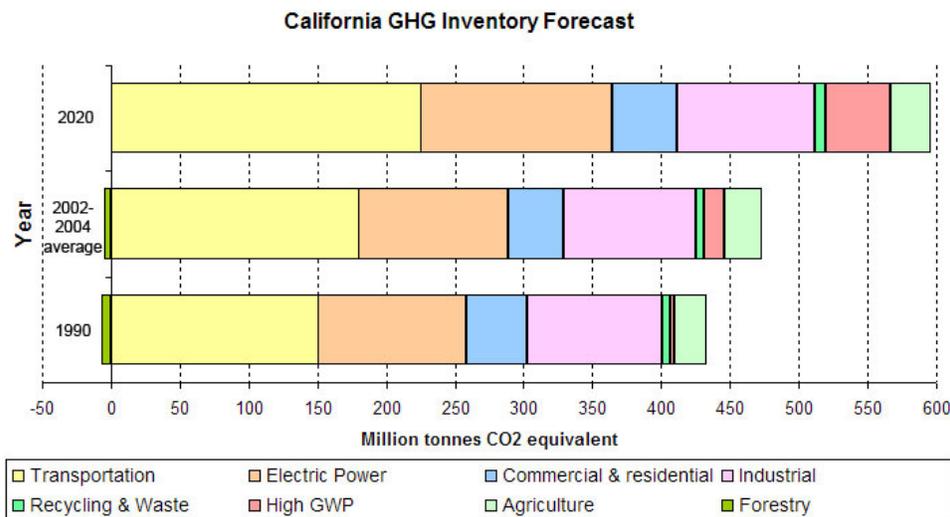
According to Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate change in CEQA Documents (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate 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 GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(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 in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, ARB recently released an updated version of the GHG inventory for California (June 26, 2008).

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<sup>1</sup> <http://www.epa.gov/climatechange/endangerment.html>.

Figure 2.17-1 shows a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.



**Figure 2.17-1 California GHG Inventory Forecast**

Taken from: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: <http://www.dot.ca.gov/docs/ClimateReport.pdf>.

## 2.17.2 Environmental Consequences

### 2.17.2.1 Temporary Direct Impacts

#### ***No Build Alternative (Alternative 1)***

The No Build Alternative would not result in the construction of any of the proposed improvements to SR-91 and therefore would not result in short-term impacts to air quality.

#### ***Build Alternatives 2 and 3***

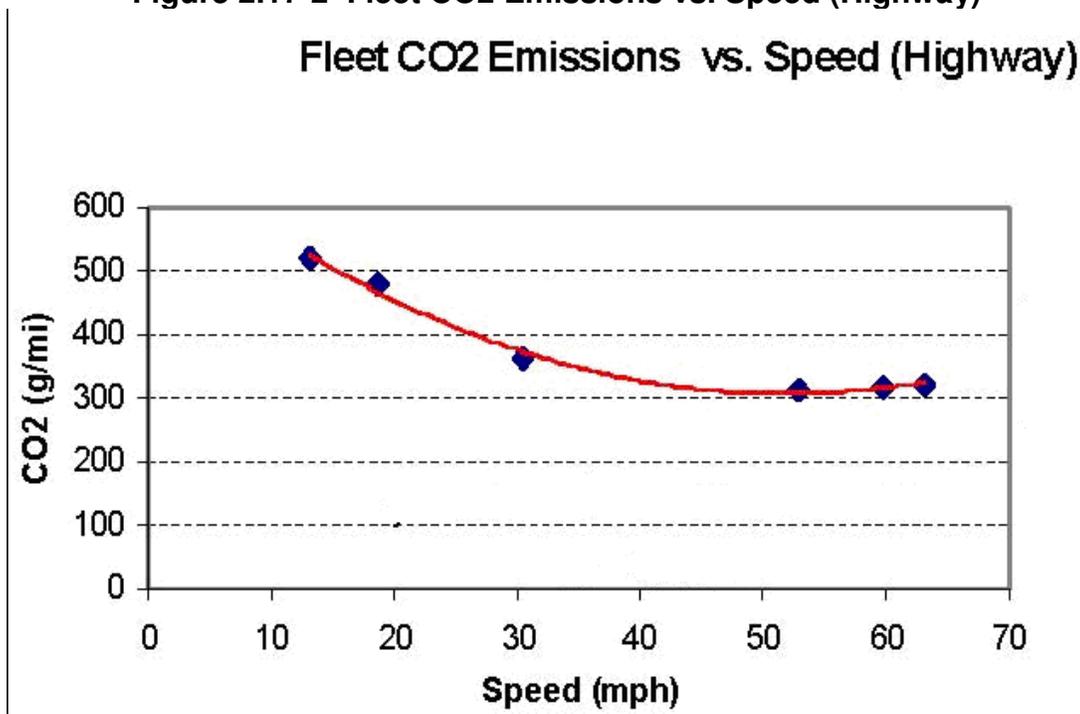
Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at

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 GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events.

### 2.17.2.2 Permanent Direct Impacts

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

Figure 2.17-2 Fleet CO<sub>2</sub> Emissions vs. Speed (Highway)



The purpose of the proposed project is to eliminate and reduce existing and future operational conflicts on SR-91 between the northbound (NB) SR-55 connector and westbound (WB) SR-91 and the WB Tustin Avenue off-ramp during peak hours. The proposed project would not generate new vehicular traffic trips since it would not construct new homes or businesses. However, there is a possibility that some traffic

currently utilizing other routes would be attracted to use the improved facility, thus resulting in increased vehicle miles traveled (VMT) within the project area. Therefore, the potential impact of the proposed roadway improvement project on regional vehicle emissions was calculated using traffic data for the project region and emission rates from the EMFAC2007 emission model.

A regional traffic analysis prepared by the Orange County Transportation Authority (OCTA; August 2009) estimated the impact that the proposed project would have on regional VMT and vehicle hours traveled (VHT). This VMT and VHT data, along with the EMFAC2007 emission rates, were used to calculate the GHG emissions for the 2035 regional conditions. The results of the modeling are included in Appendix B and summarized in Tables 2.17.1 and 2.17.2. As shown in these tables, the Build Alternatives would reduce the vehicle emissions within the region. Therefore, the Build Alternatives would not contribute substantially to regional vehicle GHG emissions.

**Table 2.17.1 Alternative 2 Vehicle Greenhouse Gas Emissions (lbs/day)**

Pollutant	2035 No Build Emissions	2035 Alternative 2 Project Emissions	Project-Related Change
CO <sub>2</sub>	86,520,000	86,489,000	-31,000
CH <sub>4</sub>	1,720	1,720	0
CO <sub>2</sub> e	86,563,000	86,532,000	-31,000

Source: LSA Associates, Inc., April 2010.  
 CH<sub>4</sub> = methane  
 CO<sub>2</sub> = carbon dioxide  
 CO<sub>2</sub>e = carbon dioxide equivalent  
 lbs/day = pounds per day

**Table 2.17.2 Alternative 3 Vehicle Greenhouse Gas Emissions (lbs/day)**

Pollutant	2035 No Build Emissions	2035 Alternative 3 Project Emissions	Project-Related Change
CO <sub>2</sub>	86,520,000	86,362,000	-158,000
CH <sub>4</sub>	1,720	1,700	-20
CO <sub>2</sub> e	86,563,000	86,405,000	-158,000

Source: LSA Associates, Inc., April 2010.  
 CH<sub>4</sub> = methane  
 CO<sub>2</sub> = carbon dioxide  
 CO<sub>2</sub>e = carbon dioxide equivalent  
 lbs/day = pounds per day

These GHG emissions numbers are only useful for a comparison between alternatives. The numbers are not necessarily an accurate reflection of what the true GHG emissions will be because GHG emissions are dependent on other factors that are not part of the model such as the fuel mix (EMFAC model emission rates are only for direct engine-out CO<sub>2</sub> and CH<sub>4</sub> emissions, not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components), rate of acceleration, and the aerodynamics and efficiency of the vehicles.

SR-91 is the only major transportation facility connecting Orange County and Riverside County. It is also a major link connecting the Los Angeles region with the Inland Empire, and also accommodates interstate traffic. As such, it is heavily used for goods movement, including throughput from the Ports of Los Angeles and Long Beach; commuter traffic between residential developments in the Inland Empire and employment centers in Orange and Los Angeles counties; and interregional traffic, including weekend recreational traffic to Las Vegas and Colorado River destinations.

SR-91 is one of the most heavily congested freeways in Southern California. Normal morning delays begin at 5:00 a.m. and continue through 9:00 a.m., while afternoon delays generally extend between 3:00 p.m. and 7:00 p.m. Based on field observations during peak periods and the traffic analysis for this project, there is a definite need to relieve congestion and improve operational efficiency on SR-91 from SR-55 to Tustin Avenue. Congested conditions are particularly worse in the WB direction of travel during the a.m. peak period and in the EB direction of travel during the p.m. peak period. As growth continues in Southern California, and specifically in the Inland Empire, the SR-91 freeway, being the only large transportation corridor that connects Orange County to communities in Riverside and San Bernardino Counties, will become increasingly congested unless capacity enhancements are made or additional corridors are created. The proposed project and the design alternatives were developed by a multidisciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. See Chapter 1 for more detail on the planning aspects of the project and how the modal choice for the project was made.

### ***CEQA Conclusion***

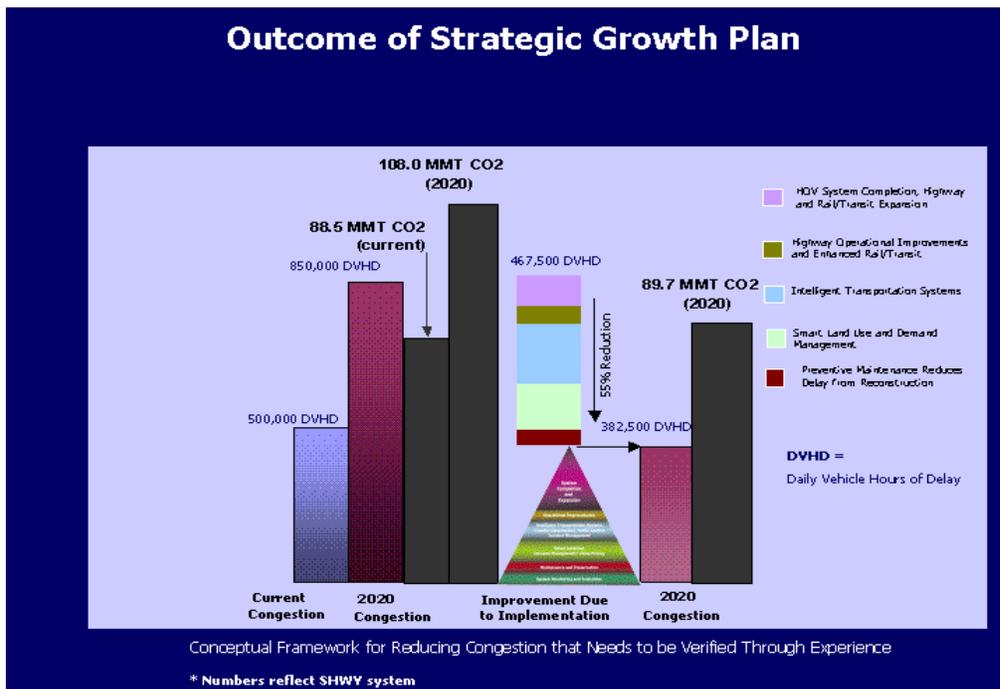
While construction will result in a slight increase in GHG emissions during construction, it is anticipated that any increase in GHG emissions due to construction will be offset by the improvement in operational GHG emissions. While it is Caltrans determination regarding the project's direct impact and its contribution on the

cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions.

### AB 32 Compliance

Caltrans continues to be actively involved on the Governor’s Climate Action Team as ARB works to implement the Governor’s Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. 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 \$107 in transportation funding during the next decade. As shown in Figure 2.17-3, the Strategic Growth Plan targets a significant decrease in traffic congestion below today’s level and a corresponding reduction in GHG 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 yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

Figure 2.17-3 Outcome of Strategic Growth Plan



As part of the Climate Action Program at Caltrans (December 2006, <http://www.dot.ca.gov/docs/ClimateReport.pdf>), 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 on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and ARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the UC Davis.

Table 2.17.3 summarizes the Department and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at <http://www.dot.ca.gov/docs/ClimateReport.pdf>.

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

Possible mitigation measures:

1. Caltrans and the California Highway Patrol are working with regional agencies to implement Intelligent Transportation Systems (ITS) to help manage the efficiency of the existing highway system. ITS is commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
2. In addition, the SCAG provides ridesharing services and park-and-ride facilities to help manage the growth in demand for highway capacity.

**Table 2.17.3 Climate Change Strategies**

Strategy	Program	Partnership		Method/Process	Estimated CO <sub>2</sub> Savings (MMT)	
		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 & 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 & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

3. Landscaping reduces surface warming, and through photosynthesis, decreases CO<sub>2</sub>. The project proposes planting in the intersection slopes, drainage channels, and seeding in areas adjacent to frontage roads and planting a variety of different-sized plant material and scattered skyline trees where appropriate but not to obstruct the view of the mountains. Caltrans has committed to planting a minimum of 40 trees. These trees will help offset any potential CO<sub>2</sub> emissions increase. Based on a formula from the Canadian Tree Foundation,<sup>1</sup> it is anticipated that the planted trees will offset between 7-10 tons of CO<sub>2</sub> per year.
4. The project would incorporate the use of energy efficient lighting, such as LED traffic signals. LED bulbs — or balls, in the stoplight vernacular — cost \$60 to \$70 apiece but last five to six years, compared to the one-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the projects CO<sub>2</sub> emissions.<sup>2</sup>
5. According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to ten minutes in each direction; in addition, the contractor must comply with Monterey Bay Unified Air Pollution Control District's rules, ordinances, and regulations in regards to air quality restrictions.

### **Adaptation Strategies**

“Adaptation strategies” refer to how Caltrans and others can plan for the effects of climate change on the state’s transportation infrastructure and strengthen or protect the facilities from damage. 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

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<sup>1</sup> Canadian Tree Foundation at [http://www.tcf-fca.ca/publications/pdf/english\\_reduceco2.pdf](http://www.tcf-fca.ca/publications/pdf/english_reduceco2.pdf). For rural areas the formula is: # of trees/360 x survival rate = tones of carbon/year removed for each of 80 years.

<sup>2</sup> Knoxville Business Journal, “LED Lights Pay for Themselves,” May 19, 2008 at <http://www.knoxnews.com/news/2008/may/19/led-traffic-lights-pay-themselves/>.

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 adaption 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, Governor Schwarzenegger signed Executive Order S-13-08 which 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 Natural Resources Agency, (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, Resources Agency was directed to request the National Academy of Science to prepare a Sea Level Rise Assessment Report by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- 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;
- The range of uncertainty in selected sea level rise projections;
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;
- A 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 vulnerability of transportation systems to sea level affecting safety, maintenance and operational improvements of the system

and 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 that are planning to construct 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 in order 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 the next five years (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 regarding 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 is not mandated to consider sea level rise because of the distance from the ocean.

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

On August 3, 2009, Natural Resources Agency in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft, which 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 discussion draft, including 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 Gov. Schwarzenegger's November

2008 Executive Order S-13-08 that specifically asked the 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 Natural Resource Agency website on December 2, 2009; it can be viewed 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, the Caltrans will be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.