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

This chapter describes the current state of the resources in the project area and identifies the potential effects 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, minimize, or mitigate those impacts.

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

The environmental impact analyses discuss potential impacts in three general categories: human environment, physical environment, and biological environment. The following discussion of potential effects 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:

- **Coastal Zone:** California's Coastal Zone generally extends 1,000 yards inland from the mean high tide line. The project area is located approximately 4 miles (mi) from the Pacific Ocean and is not located within the Coastal Zone.
- **Wild and Scenic Rivers:** According to the Bureau of Land Management, there are no wild and scenic rivers located in the project area.[1]
- **Farmlands:** According to the Community Impact Assessment (CIA) (2015) prepared for the project, there is a parcel immediately to the west of the State

[1] U.S. Department of the Interior, Bureau of Land Management. Wild and Scenic Rivers. http://www.blm.gov/ca/st/en/prog/blm_special_areas/wildrivers.html. Accessed April 8, 2013.

Route 55 (SR-55)/Interstate 405 (I-405) Interchange that is currently being used for agricultural uses. This parcel is designated as Farmland of Statewide Importance by the the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP). However, the designated farmland adjacent to the SR-55/I-405 Interchange would not be impacted by the proposed project.

- **Timberland**: The City of Santa Ana General Plan (Conservation Element, adopted September 20, 1982; Open Space, Parks, and Recreation Element, adopted September 20, 1982; and Economic Development Element, adopted July 6, 1998; all three Elements reformatted January 2010) does not show any timberland resources or activities in the City, including the area along the project segment of SR-55. The City of Tustin General Plan Conservation/Open Space/Recreation Element (June 17, 2008) does not show any timberland resources or activities in the City, including the area along the project segment of SR-55. The City of Irvine General Plan (Parks and Recreation Element and Conservation and Open Space Element, Supplement No. 8, June 2012) does not show any timberland resources or activities in the City of Irvine, including the area along the project segment of SR-55.
- **Natural Communities:** According to the *Natural Environment Study (Minimal Impacts)* (2015), the Biological Study Area (BSA) does not contain any natural communities. The five habitat types present in the BSA include ruderal, ornamental landscaping, clear or graded, urban, and transportation.
- **Threatened and Endangered Species:** According to the *Natural Environment Study (Minimal Impacts)* (2015), the BSA does not contain suitable habitat for any threatened or endangered species.

HUMAN ENVIRONMENT

2.1 Land Use

This section is based on information from the *Community Impact Assessment* (CIA; 2015) and Appendix B, Resources Evaluated Relative to the Requirements of Section 4(f), of this environmental document.

2.1.1 Existing and Future Land Uses

The study area for the land use analysis includes the project area (the physical area that would be directly affected by the Build Alternatives) and the adjacent neighborhoods within the cities of Tustin, Santa Ana, and Irvine (Census Tracts 525.02, 740.03, 740.04, 744.03, 744.08, 755.05, 755.07, 755.12, 755.13, 755.14, and 755.15). The census tracts are depicted later on Figure 2.3-1 in Section 2.3, Community Impacts.

2.1.1.1 Existing Land Uses

The existing land uses in the study area are shown on Figure 2.1-1. Existing land uses in the southern portion of the study area between Interstate 405 (I-405) and Edinger Avenue generally consist of commercial and industrial uses and a small number of multifamily residential uses. The northern portion of the study area between Edinger Avenue and Interstate 5 (I-5) is dominated by multifamily residential and commercial properties. The acreages and percentages of existing land uses in the study area are shown in Table 2.1.1.

Table 2.1.1 Existing Land Uses in the Study Area

Land Use	Acres	Percentage
Commercial and Services	1,811	25.1%
Industrial	2,340	32.2%
Mixed Commercial and Industrial	107	1.5%
Open Space and Recreation	66	0.9%
Residential	1,626	22.6%
School	217	3.0%
Transportation, Communication, and Utilities	164	2.3%
Vacant	876	12.2%
Total	**7,206**	**—**

Source: Table 3.1.1, *Community Impact Assessment* (2015).
Note: Existing land use data were updated based on a review of aerial imagery of the study area taken on March 24, 2015.

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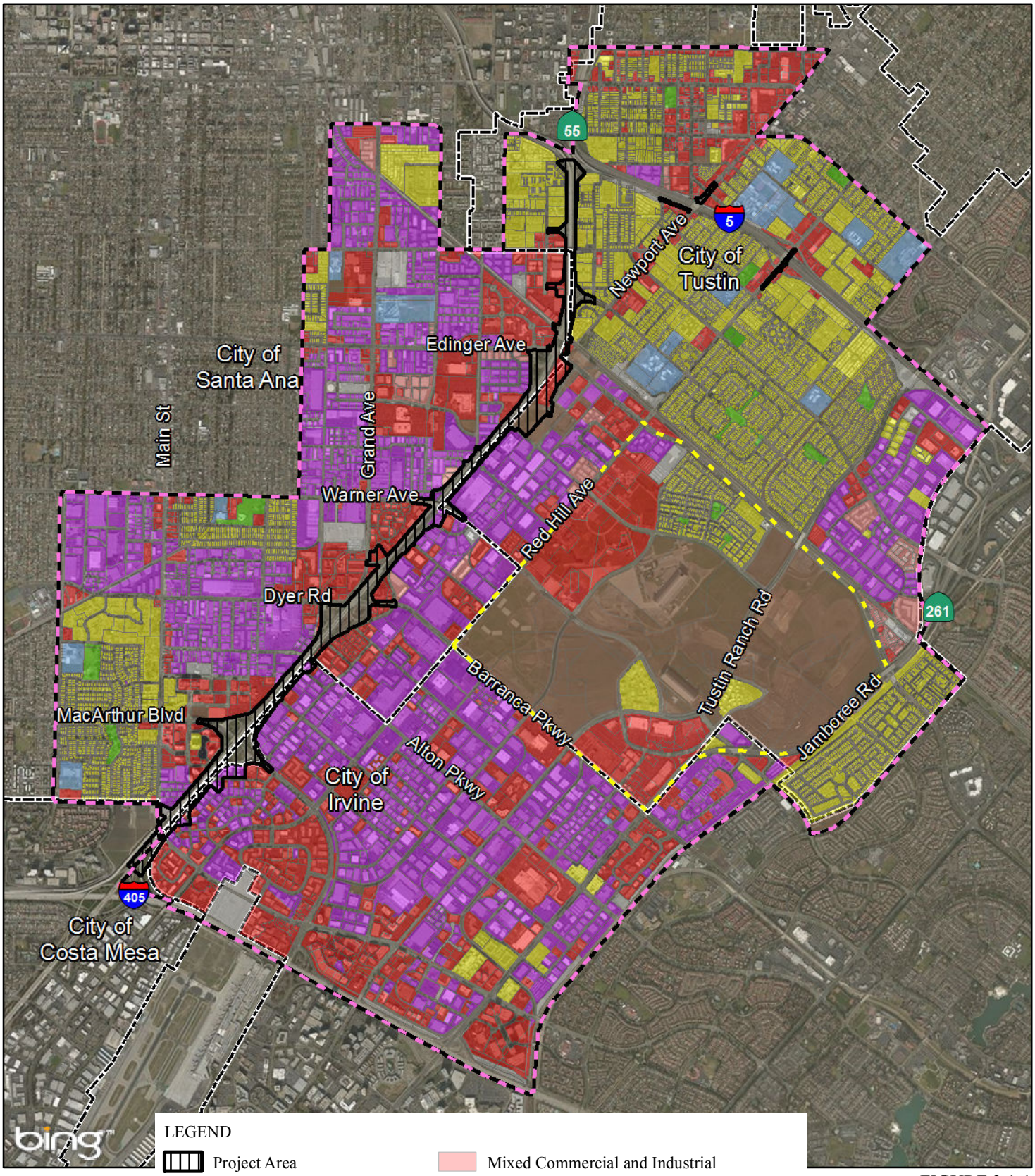

LEGEND

- Project Area
- Study Area
- Former Site of Marine Corps Air Station (MCAS) Tustin

Existing Land Use

- Residential
- Commercial and Services
- Mixed Commercial and Industrial
- Industrial
- Open Space and Recreation
- School
- Transportation, Communications and Utilities
- Vacant

N

0 1750 3500
FEET

SOURCE: Bing Maps (2013); SCAG (2008)

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FIGURE 2.1-1

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Existing Land Uses

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As indicated in Table 2.1.1, approximately 876 acres (ac) or approximately 12.2 percent of the study area consists of vacant land. As shown on Figure 2.1-1, this vacant land is largely confined to two areas within the study area. The majority of the vacant land in the study area (approximately 810 ac) is located on the former site of Marine Corps Air Station (MCAS) Tustin in the area bound by Red Hill Avenue, Barranca Parkway, Jamboree Road, and Edinger Avenue. The study area also includes a large area of vacant land along the east side of State Route 55 (SR-55) in the vicinity of the Edinger Avenue interchange. A large parcel immediately to the west of the SR-55/I-405 interchange in the City of Costa Mesa remains in agricultural use.

2.1.1.2 General Plan Land Uses

General Plan land use designations for the study area and surrounding areas, which guide future development, are shown on Figure 2.1-2. As shown on Figure 2.1-2, vacant land at the former MCAS Tustin is designated for mixed commercial and residential, commercial, and residential uses, while the vacant land in the vicinity of the Edinger Avenue on- and off-ramps from northbound SR-55 is designated for commercial uses. The parcel immediately west of the SR-55/I-405 interchange that is currently being used for agricultural uses is designated for mixed commercial and residential uses by the City of Costa Mesa General Plan. The existing land uses in the study area are generally consistent with the land use designations in the General Plans of the cities of Tustin, Santa Ana, and Irvine.

2.1.1.3 Development Trends

The City of Tustin, the third oldest city in Orange County (County), encompasses an area of 11.08 square miles (sq mi). In 2011, the City of Tustin had 76,689 residents, and since 1990, it has grown at a faster rate than neighboring City of Santa Ana, but slower than the City of Irvine. The City of Tustin contains significant land available for development at the former site of MCAS Tustin. In addition, some development opportunities exist for freeway-oriented development adjacent to SR-55 at the Edinger Avenue interchange. According to Southern California Association of Governments (SCAG) growth projections, the City of Tustin is projected to become more jobs rich over the next several decades. Based on SCAG projections, the employment base is projected to increase by 58 percent from 42,100 in 2008 to 66,800 in 2035. During the same time period, SCAG projects that Tustin's population will increase approximately 7.5 percent, from 76,689 in 2008 to 82,900 in 2035.

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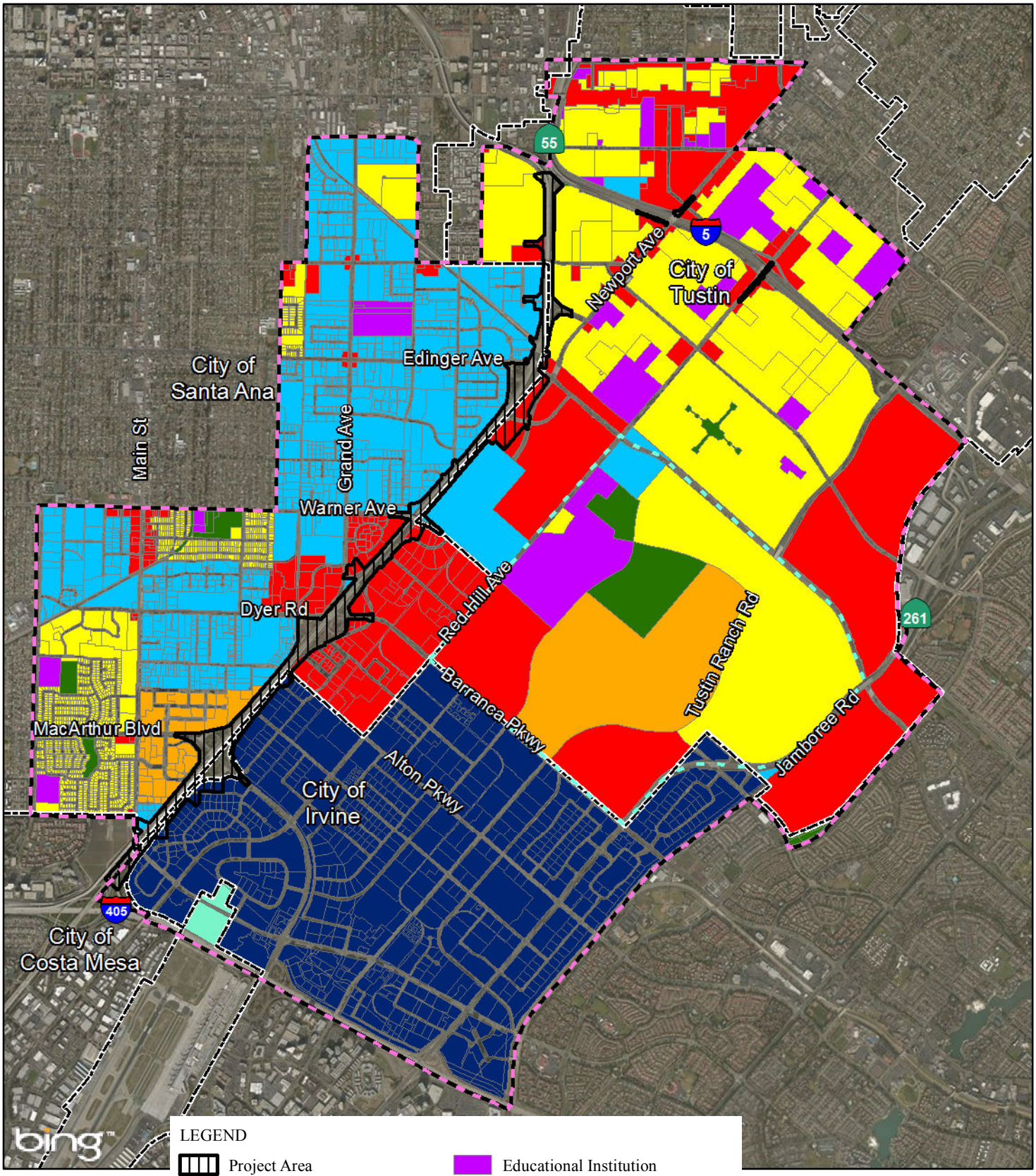

LEGEND

- Project Area
- Study Area
- Former Site of Marine Corps Air Station (MCAS) Tustin

General Plan Land Uses

- Residential
- Commercial
- Educational Institution
- Industrial
- Airport Right-of-Way
- Mixed Commercial and Industrial
- Mixed Urban
- Public Facilities

N

0 1750 3500
FEET

FIGURE 2.1-2

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

General Plan Land Uses

12-ORA-55 PM 6.4/10.3
EA 0J3400/1200020328

SOURCE: Bing Maps (2013); City of Costa Mesa (2009); City of Irvine (2010); City of Santa Ana (2011); City of Tustin (2012)

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The City of Santa Ana is the second largest city in Orange County in terms of population (329,427 residents) and the fifth largest city in the County in terms of land area (27.3 sq mi). Santa Ana experienced rapid population growth from 1970 to 1990 that was largely due to an influx of Hispanic/Latino immigrants. Since 1990, Santa Ana has grown at a modest rate of 1 percent per year. Although Santa Ana is essentially a built-out community, the few remaining vacant parcels in the City have been designated for high-density commercial and residential development. Based on SCAG projections (2012), Santa Ana's population is projected to grow from 329,427 in 2008 to 336,700 in 2035, which translates into a modest 2 percent increase. During that same time period, SCAG projects that employment in Santa Ana will drop by 11 percent, from 168,400 to 149,400.

The City of Irvine was incorporated in 1971 and currently encompasses approximately 45 sq mi. The City of Irvine experienced a rapid population growth between 1990 and 2010 during which its population almost doubled. As of 2010, Irvine is the third largest city in Orange County in terms of population at 215,529 people. Residential growth has been mainly concentrated around the geographic center of the City whereas employment growth has been concentrated adjacent to regional transportation facilities, including John Wayne Airport, I-405, I-5, and the Irvine train station. The northern and southern hillside areas of the City of Irvine are largely undeveloped lands. According to the City of Irvine General Plan, build out is anticipated to occur in 2040. Based on SCAG projections (2012), the City of Irvine's population is expected to grow from 215,529 in 2008 to 304,200 by 2035, which translates into a 41 percent population increase. Employment is projected to increase by 30 percent, from 223,500 in 2008 to 291,800 in 2035.

Approved and planned projects in the study area are described in Table 2.19.1 and shown on Figure 2.19-1 in Section 2.19, Cumulative Impacts.

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

This section discusses the Project's consistency with the SCAG 2012–2035 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS), the SCAG 2015 Federal Transportation Improvement Program (FTIP), the Orange County Transportation Authority (OCTA) Measure M Renewal Ordinance, the OCTA M2020 Plan, the OCTA Long Range Transportation Plan (LRTP), and the General Plans of the cities of Tustin, Santa Ana, and Irvine.

2.1.2.1 SCAG Regional Transportation Plan/Sustainable Communities Strategy

SCAG is the largest regional planning agency in the nation, functioning as the Metropolitan Planning Organization (MPO) for six counties and 187 cities.

SCAG develops long-term solutions for regional challenges such as transportation, air quality, housing, growth, hazardous waste, and water quality. Because these issues cross city and county boundaries, SCAG works with cities, counties, and public agencies in the six-county region (i.e., Los Angeles, Orange, Ventura, San Bernardino, Riverside, and Imperial Counties) to develop plans and strategies to address these issues.

SCAG has developed strategies that specifically address the growth and transportation issues facing Southern California, including the RTP/SCS. The RTP/SCS is intended to be a usable reference document for local planners, business people, and other individuals whose work affects the future built environment in Southern California. SCAG's 2012–2035 RTP/SCS is a long-range plan that identifies multimodal regional transportation needs and investments over the next 23 years in Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties.

The 2012–2035 RTP/SCS was adopted by SCAG on April 4, 2012, and last amended (Amendment No. 2) in 2014. SCAG's 2012–2035 RTP/SCS establishes a transportation vision for Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial Counties. The 2012–2035 RTP/SCS places a greater emphasis on sustainability and integrated planning than previous RTPs and defines three principles that collectively work as the key to the region's future: mobility, economy, and sustainability. SCAG updates the RTP every 4 years. The proposed project is listed in Amendment No. 2 to the 2012–2035 financially constrained RTP/SCS (RTP/SCS ID 2M0733), which was found to conform by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on December 15, 2014.

2.1.2.2 SCAG Federal Transportation Improvement Program

The FTIP is a listing of all capital transportation projects proposed over a 6-year period for the SCAG region. It is prepared to implement the projects and programs listed in the RTP and is developed in compliance with State and federal requirements. A new FTIP is prepared and approved every 2 years. These funded projects include highway improvements; transit, rail, and bus facilities; carpool lanes; signal

synchronization; intersection improvements; freeway ramps; and other related improvements.

Federal law requires that all federally funded projects and regionally significant projects (regardless of funding) must be listed in an FTIP. The proposed project is included in the SCAG financially constrained 2015 FTIP (FTIP ID ORA100511), which was found to conform by FHWA and FTA on December 15, 2014.

2.1.2.3 Measure M Renewal Ordinance

In 1990, Orange County voters approved Measure M, a half-cent sales tax for transportation improvements that was scheduled to sunset in 2011. On November 7, 2006, the County's voters renewed Measure M for a 30-year extension through 2041 and approved a continuation of transportation improvements through the Measure M Transportation Investment Plan (M2). By the year 2041, the M2 program plans to deliver approximately $15.5 billion worth of transportation improvements to Orange County. Major improvement plans target Orange County freeways, streets and roads, and transit and environmental programs. The proposed project is included as project "F" in the M2 program and is subject to the provisions of OCTA's M2 Ordinance. Attachment B, Section II.A.4, of the M2 Ordinance contains the following language related to the design of freeway projects funded by M2:

> "Freeway Projects will be built largely within existing rights of way using the latest highway design and safety requirements. However, to the greatest extent possible within the available budget, Freeway Projects shall be implemented using Context Sensitive Design, as described in the nationally recognized Federal Highway Administration (FHWA) Principles of Context Sensitive Design Standards. Freeway Projects will be planned, designed and constructed using a flexible community-responsive and collaborative approach to balance aesthetic, historic and environmental values with transportation safety, mobility, maintenance and performance goals. Context Sensitive Design features include: parkway-style designs; environmentally friendly, locally native landscaping; sound reduction; improved wildlife passage and aesthetic treatments, designs and themes that are in harmony with the surrounding communities."

OCTA adopted the M2020 Plan on September 10, 2012. The M2020 Plan is an early action delivery plan for the M2 program. The M2020 Plan identifies the development and construction of 14 freeway projects to be delivered before the year 2020. The

proposed SR-55 Improvement Project is included in the M2020 Plan as Project F, Phase I.

2.1.2.4 OCTA Long Range Transportation Plan

The OCTA LRTP provides a visionary blueprint for transportation improvements for Orange County and input into the development of the RTP. The general goals of the LRTP are to assess the performance of the transportation system over a 20+ year horizon and to identify the projects that best address the needs of the system based on expected population, housing, and employment growth, while simultaneously taking into account forecasted financial assumptions. The LRTP reflects OCTA's current policies and commitments and incorporates input from local jurisdictions, business and community leaders, County residents, transportation planning professionals, and other stakeholders. OCTA updates the LRTP about every 4 years. The last LRTP was finalized on September 12, 2014. The proposed project is included in OCTA's 2014 LRTP.

2.1.2.5 Local General Plans

As a blueprint for the future, a general plan must contain policies and programs designed to provide decision-makers with a solid basis for land use-related decisions. A general plan must address many issues that are directly related to and influence land use decisions. Land uses can include residential, business, industry, open space, natural resources, recreation, public uses, roadways, and the public utility infrastructure.

City of Tustin General Plan

The City of Tustin General Plan serves as the City's blueprint for future growth and development. Relevant circulation-related goals and policies in the City of Tustin General Plan are described below.

Circulation Element (adopted January 2008)

- **Goal 3:** Support development of a network of regional transportation facilities which ensure the safe and efficient movement of people and goods from within the City to areas outside its boundaries, and which accommodate the regional travel demands of developing areas outside the City.
    - **Policy 3.2:** Support capacity and noise mitigation improvements such as high-occupancy vehicle lanes, general purpose lanes, auxiliary lanes and noise barriers on the I-5 and SR-55 freeways.

  - **Policy 3.3:** Monitor and coordinate with California Department of Transportation (Caltrans) freeway work as it affects Tustin's roadway and require modifications as necessary.
  - **Policy 3.4:** Maintain a proactive and assertive role with appropriate agencies dealing with regional transportation issues affecting the City.
- **Goal 4:** Maximize the efficiency of the circulation system through the use of transportation system management and demand management strategies.
  - **Policy 4.3:** Encourage the implementation of employer Transportation Demand Management (TDM) requirements, which were included in the Southern California Air Quality Management District's Regulation 2202 of the 1997 Air Quality Management Plan and as required by Proposition 111 as part of the Congestion Management Program (CMP) and participate in regional efforts to implement TDM requirements.

City of Santa Ana General Plan

The City of Santa Ana General Plan was reformatted in January 2010. Relevant circulation and land use-related goals and policies in the City of Santa Ana General Plan are described below.

Circulation Element[1]

- **Goal 1:** Provide and maintain a comprehensive circulation system that facilitates the efficient movement of people and goods throughout the City, and enhances its economic viability.
  - **Policy 1.1:** Coordinate transportation improvements in a manner which minimizes disruptions to the community.
  - **Policy 1.2:** Coordinate with the State to provide a freeway system that promotes efficient and convenient access to City streets in a manner consistent with local land use policy.
- **Goal 2:** Provide design and construction that facilitate safe utilization of the City's transportation systems.
  - **Policy 2.7:** Continue design practices which facilitate the safe use of circulation systems.
- **Goal 4:** Fully coordinate transportation and land use planning activities.

[1] The Circulation Element of the City of Santa Ana General Plan is currently being revised.

  - **Policy 4.1:** Program and prioritize transportation improvements to stimulate growth in major development areas.
  - **Policy 4.2:** Assess land use and transportation project impacts through the development review process.
- **Goal 8:** Strengthen the coordination of transportation and land use planning activities with adjacent jurisdictions and regional agencies.
  - **Policy 8.1:** Participate in interjurisdictional planning forums and other inter-agency opportunities to coordinate transportation and land use projects.
  - **Policy 8.2:** Maintain compliance with regional, state, and federal programs which provide funding for transportation improvements.

City of Irvine General Plan

The City of Irvine General Plan is a comprehensive long-range statement of Irvine's development and preservation policies. Relevant circulation and land use-related goals and policies in the City of Irvine General Plan are described below.

Circulation Element

- **Objective B-1: Roadway Development:** Plan, provide and maintain an integrated vehicular circulation system to accommodate projected local and regional needs.
  - **Policy (a):** Use the Circulation, Land Use and Growth Management Elements to determine roadway sizing and phasing.
  - **Policy (i):** Actively lobby with appropriate state commissions, committees, and legislators for funding to upgrade the Costa Mesa, San Diego and Santa Ana Freeways.
  - **Policy (r):** Pursue local and outside funding for the implementation of the roadway system from sources.
- **Objective B-2 Roadway Design:** Develop a vehicular circulation system consistent with high standards of transportation engineering safety and with sensitivity to adjoining land uses.
  - **Policy (a):** Align roadways in relationship to adjoining land uses to minimize noise and visual impacts.

2.1.3 Parks and Recreational Facilities

The City of Tustin operates and maintains a total of 14 parks as well as several community facilities, including the Clifton C. Miller Community Center, the Columbus Tustin Activity Center, Tustin Area Senior Center, and the Tustin Family

and Youth Center. The following parks and community facilities in the City of Tustin are within 0.5 mi of the project area:

- **McFadden-Pasadena Parkette:** East McFadden Avenue and Pasadena Avenue, Tustin. This park is approximately 0.4 ac in size and consists of green space with a playground, picnic table, and ornamental trees. This park is adjacent to the project area.
- **Tustin Area Senior Center:** 200 South C Street, Tustin. The Tustin Area Senior Center is a 17,000-square-foot (sf) facility that features dining facilities and three classrooms and is designed to serve the needs of Tustin's senior community by providing opportunities to learn, socialize, and obtain assistance with human service needs. The Tustin Area Senior Center is approximately 0.5 mi northeast of the project area.
- **Tustin Family and Youth Center:** 14722 Newport Avenue, Tustin. The Tustin Family and Youth Center is a 6,000 sf facility designed to serve the specialized needs of the residents of southwest Tustin. The facility provides a full range of family- and youth-oriented social, educational, and recreational programs, including English as a Second Language (ESL) classes for adults, and serves as a resource/referral center for families in need, youth at risk, and for individuals seeking self-improvement and vocational opportunities. The Tustin Family and Youth Center is approximately 0.1 mi east of the project area.
- **Frontier Park:** 1400 Mitchell Avenue, Tustin. This park is approximately 4.5 ac in size and consists of green space with a playground, Frisbee golf course, outdoor fitness equipment, restrooms, and shaded picnic areas. Frontier Park is approximately 0.1 mi northwest of the project area.
- **Pine Tree Park:** 1402 Bryan, Tustin. This park is approximately 4.2 ac in size and consists of green space with a playground, one sand volleyball court, portable skate park, restrooms, and a picnic shelter. Pine Tree Park is approximately 0.4 mi north of the project area.

The City of Santa Ana operates and maintains a total of 35 parks, 2 senior centers, 6 recreation centers, 2 tennis centers, and several other community facilities. The following parks and community facilities in the City of Santa Ana are within 0.5 mi of the project area:

- **Santa Ana Zoo at Prentice Park:** 1801 East Chestnut Street, Santa Ana. The 19 ac Santa Ana Zoo features over 80 species of animals, a children's farm, a

train ride, and a carousel. The Santa Ana Zoo is located approximately 0.5 mi northwest of the project area.

- **Sandpointe Park:** 450 West MacArthur Boulevard, Santa Ana. Amenities include a basketball court, a volleyball court, a hiking/exercise trail, playground equipment, tennis courts, and restrooms. This park is approximately 7.0 ac in size and located approximately 0.4 mi west of the project area. The Sandpointe Recreation Center is also located at Sandpointe Park.

There are no parks or community facilities owned or operated by the City of Irvine within 0.5 mi of the project area.

Parks and recreation resources within 0.5 mi of the project area are shown on Figure B-1 in Appendix B, Resources Evaluated Relative to the Requirements of Section 4(f). They were evaluated to assess whether they would trigger the requirements for protection under Section 4(f). As discussed in Appendix B, the project would not result in the use of Section 4f Resources. Refer to Appendix B for additional discussion regarding evaluation of the project under Section 4(f).

In California, public parks operated by public agencies are protected by the Park Preservation Act (California Public Resources Code [PRC] Sections 5400–5409). The Park Preservation Act prohibits local and State agencies from acquiring any property that is in use as a public park at the time of acquisition unless the acquiring agency pays sufficient compensation or land, or both, to enable the operator of the park to replace the park land and any park facilities on that land. Because none of the Build Alternatives would result in the acquisition of land in use as a public park, the requirements of the Park Preservation Act do not apply to the proposed project.

2.1.4 Environmental Consequences

2.1.4.1 Temporary Impacts

Build Alternatives

Land Use

Construction of Alternatives 1, 2, 3, and 4 may require construction staging areas on a vacant parcel adjacent to the northbound SR-55 off-ramp to Edinger Avenue and in Caltrans right of way along southbound SR-55 north of McFadden Avenue. Staging activities may result in temporary increases in dust and noise levels in the vicinity of these staging areas; however, due to their temporary nature, such activities are not anticipated to result in land use conflicts with adjacent businesses and residences.

Alternative 1 would require temporary construction easements (TCEs) on two flood control parcels and one railroad parcel. Alternatives 2, 3, and 4 would require TCEs on three flood control parcels and two railroad parcels in order to place pre-cast concrete box girders above the Santa Ana-Santa Fe Channel and the Los Angeles-San Diego-San Luis Obispo rail corridor (LOSSAN rail corridor) so that the South Tustin Overhead Bridge can be widened. Since these activities would not affect the ability of the Santa Ana-Santa Fe Channel to convey storm water flows, the Build Alternatives would not result in temporary land use conflicts with the affected flood control parcels. Construction of the widening of the South Tustin Overhead Bridge under the Build Alternatives could potentially affect railroad operations on the LOSSAN rail corridor by causing service delays. However, construction activities within the rail corridor would be coordinated with operators using those tracks (i.e., Metrolink, Amtrak, Union Pacific Railroad, and BNSF Railway) to minimize railroad service delays.

During construction, the Build Alternatives would require the temporary use of privately owned property for additional TCEs necessary to allow access to construct retaining walls, sound walls, road widening, and other project features. The locations of the parcels where TCEs would be needed under Alternatives 1, 2, 3, and 4 are shown on Figures 2.3-2 through 2.3-5 in Section 2.3, Community Impacts.

TCEs would be required adjacent to SR-55 in order to allow access for the construction of sound walls, retaining walls, and roadway widening:

- Alternative 1 would require a total of 24 TCEs, 16 on commercial and industrial parcels, 5 on residential parcels, 2 on flood control parcels, and 1 on a railroad parcel.
- Alternative 2 would require a total of 47 TCEs, 36 on commercial and industrial parcels, 5 on residential parcels, 3 on flood control parcels, 2 on railroad parcels, and 1 on a publicly owned parcel.
- Alternative 3 would require a total of 59 TCEs, 48 on commercial and industrial parcels, 5 on residential parcels, 3 on flood control parcels, 2 on railroad parcels, and 1 on a vacant parcel.
- Alternative 4 would require a total of 49 TCEs, 38 on commercial and industrial parcels, 5 on residential parcels, 3 on flood control parcels, 2 on railroad parcels, and 1 on a vacant parcel.

Given that most of these TCEs generally consist of land that is currently being used for landscaping and parking lots, temporary impacts related to land use compatibility would be limited to parking impacts.

Table 2.1.2 provides information about the parcels that would require temporary parking lot reconfigurations, including the names of the businesses operating on those parcels and the approximate number of parking stalls that would be temporarily reconfigured. Where TCEs would be required on parking lots adjacent to SR-55, alternative parking would be provided or parking lots would be temporarily reconfigured to accommodate impacted businesses. Following completion of the project, any off-street parking areas that are temporarily disturbed by construction activities would be returned to their property owners in the same or better condition as prior to construction. Owners of parcels where TCEs would be required would receive compensation for the temporary use of a portion of their property, which would further minimize the impacts related to the use of property for TCEs.

Consistency with State, Regional, and Local Plans and Programs

Consistency with State, regional, and local plans and programs is related to the consistency of permanent project changes with those plans. As a result, the construction of the Build Alternatives for the proposed project would not result in any temporary inconsistencies with State, regional, and local plans and policies.

Parks and Recreational Facilities

During construction of the Build Alternatives, access to nearby schools, parks, and other community facilities would not be temporarily modified or otherwise affected as part of the proposed project. Although MacArthur Boulevard, McFadden Avenue, Sycamore Avenue, Red Hill Avenue, and Grand Avenue have been identified as potential detour routes for the overnight mainline, ramp, and arterial closures, those closures are expected to occur during overnight hours. Therefore, none of the schools, parks, and other community facilities located adjacent to these streets (i.e., Sandpointe Park, the McFadden-Pasadena Parkette, Hillview High School/Tustin Adult School, Jeane Thorman Elementary School, A.G. Currie Middle School, the Tustin Family and Youth Center, St. Cecilia School, and the Industrial Santa Ana Post Office) would be adversely affected by travel delays or increased noise levels because they would be closed or unused during overnight hours.

Detours associated with the overnight ramp closures would result in minor temporary traffic increases on MacArthur Boulevard, McFadden Avenue, Sycamore Avenue, Red Hill Avenue, and Grand Avenue between 10:00 p.m. and 5:00 a.m. Because more than one preliminary detour route has been identified for all but one of the ramp closures, alternative detour routes would be available to help avoid travel delays and increased noise levels near schools, parks, and other community facilities. The final

Table 2.1.2 Temporary Off-Street Parking Impacts Under the Build Alternatives

APN	Address	Business Name(s)	Existing Land Use	Temporarily Reconfigured Parking Stalls	Build Alternatives			
					Alt 1	Alt 2	Alt 3	Alt 4
402-101-07	1535 Trotter Street Santa Ana, CA 92705	Freeway Honda	Commercial	2	●	●	●	●
402-101-39	1505 Auto Mall Drive Santa Ana, CA 92705	Freeway Honda	Commercial	6	●	●	●	●
430-031-09	1717 East Dyer Road Santa Ana, CA 92705	Motel 6	Commercial	8	●	●	●	●
430-112-12	1063 McGaw Avenue Irvine, CA 92614	A-Mark Precious Metals, Collateral Finance Corporation, H.R. Harmer, Spectrum Group International, Spectrum Numismatics International, Spectrum Wine Auctions, Stack's Bowers, Teletrade	Commercial	5			●	●
430-171-07	1740 East Garry Avenue Santa Ana, CA 92705	Advanced Plant Engineering Contractors, American Senior Living, Borazzi International, California MHP Management, Carson & Company, CHC Consulting, Cocojojo, Creative Integrated Systems, Creative Transportation, Diamond Roofing, Drink Pass, EFC Foundation, Elite Nursing Services, Energy Data Surveys Vinyl Windows, Gina Skin Care, Global Life Center, Gracorp, Hartley & Associates, HEC Services, Integrated Technology Systems, JTL Design Engineering, Kelsurveys, Inc., Lamaison Construction, Motion Analysis, OBM Global Technology, Powers Marketing Group, PMG/Zoom Western/SMD, Precision Payroll, Quality Professionals, Quick Processing – Bamma USA, Readwrite Solutions, Raybit Systems, RK Solutions, Rotary Lift, RVM Engineering, Safe Realty Property Management, Sandwich Express, Secret Garden, SEOP, Inc., Shoshin USA, SIG Technologies, South District Patrol, Southwest Express, SWC, Title XI	Commercial	35			●	●

Source: *Community Impact Assessment* (2015)
● = Parking impact occurs for Build Alternative
Alt = Alternative
APN = Assessor's Parcel Number

detour routes would be determined based on coordination with the affected cities. Flag persons and other traffic control measures would be implemented to address any safety or access issues related to schools, parks, or community facilities.

The Class I bike trails in the project area are not in areas that would be temporarily disturbed or on near streets that would be used as detour routes during construction. As a result, construction of the Build Alternatives would not temporarily modify or otherwise affect access to the bike trails in the project area.

As discussed in detail in Appendix B, the construction of the Build Alternatives would not result in the temporary use of any land from any Section 4(f) resource. As also discussed in Appendix B, construction of the Build Alternatives would not result in short-term adverse access, air quality, noise, or other proximity impacts at any parks, recreation facilities, or schools. As a result, the short-term proximity impacts of the Build Alternatives at these parks, recreation facilities, and schools would not substantively impair the protected activities, features, or attributes of these resources in terms of their Section 4(f) significance and, therefore, would not trigger the requirements for protection of those resources under Section 4(f).

No Build Alternative

The No Build Alternative would not result in the construction of any improvements on the project segment of SR-55 other than routine maintenance. As a result, the No Build Alternative would not result in temporary adverse effects related to existing and planned land uses, parks and recreation facilities, or Section 4(f) resources.

Consistency with State, regional, and local plans and programs is related to the consistency of permanent changes with those plans. Because the No Build Alternative would not result in any improvements to SR-55, it would not result in any temporary inconsistencies with State, regional, and local plans and policies.

2.1.4.2 Permanent Impacts

Build Alternatives

Land Use

The Build Alternatives would require the permanent acquisition of privately owned property for right of way to accommodate the project improvements, as shown on Figures 2.3-2 through 2.3-5 and summarized in Tables 2.3.7 through 2.3.11 in Section 2.3, Community Impacts. Properties acquired by the proposed project would be converted from their current land use to transportation land uses or public drainage facilities. All of the proposed property acquisitions are situated adjacent to existing

commercial and industrial land uses that would benefit from increased freeway visibility and improved circulation in their vicinity. Because the Build Alternatives would impact freeway-adjacent properties, improve freeway operations, and reduce traffic congestion in the area, the land use compatibility impacts are not considered to be substantial.

Some of the partial acquisitions may result in the loss of landscaping or require parking lot reconfigurations on parcels. Table 2.1.3 provides information about the parcels that would require parking lot reconfigurations under each of the Build Alternatives, including the existing and proposed number of parking stalls as well as the number of parking stalls required by the applicable municipal parking regulations. As shown in Table 2.1.3, Alternatives 1 and 2 would result in the permanent loss of 8 parking stalls, and Alternatives 3 and 4 would result in the permanent loss of 20 parking stalls. OCTA would apply to the affected cities to obtain parking and/or landscaping variances for properties where the project would reduce the number of off-street parking stalls and/or the required amount of landscaping below the applicable municipal off-street parking and/or landscaping requirements.

Consistency with Regional Plans

The design concept and scope of the proposed project are consistent with Amendment No. 2 to the 2012–2035 RTP/SCS and 2015 FTIP and are intended to meet the traffic needs in the area based on local land use plans. The proposed project would be designed in compliance with the requirements of the M2 Ordinance and is consistent with OCTA's 2014 LRTP and M2020 Plan. Thus, the Build Alternatives are consistent with the regional and federal transportation plans.

Consistency with General Plans

The General Plan goals and policies consistency analysis for the Build Alternatives is provided in Table 2.1.4. Each of the Build Alternatives would be consistent with the applicable goals, policies, and objectives contained in the General Plans of the cities of Tustin, Santa Ana, and Irvine. Specifically, the project is consistent with the goals, policies, and objectives to improve regional transportation facilities, maximize the efficiency of the circulation system, and improve access to the city streets. In addition, implementation of the Build Alternatives would not result in changes to existing land use patterns along SR-55 since SR-55 is an existing transportation facility that is located in a highly developed area, and the Build Alternatives would result in a limited number of acquisitions. None of the Build Alternatives would require amendment of the affected cities' General Plans.

Table 2.1.3 Permanent Off-Street Parking Impacts Under the Build Alternatives

APN	Address	Business Name(s)	Existing Land Use	Parking Stalls				Build Alternatives			
				Existing	Required	Proposed	Diff.	Alt 1	Alt 2	Alt 3	Alt 4
402-101-07 402-101-39 402-101-45	2101 E. Edinger Avenue Santa Ana, CA 92705	Freeway Honda	Commercial	421	325	413	-8	●	●	●	●
402-111-24	1411 Village Way Santa Ana, CA 92705	Advanced Office Services, The Baseball Academy, Calumet Photographic, CubeKing, Enterprise Fleet Services, Liquid Handling, Monkeysports, Motorvac Technologies, Roger Dunn Golf Shop, Sender One Climbing, The Wine Club, Worldwide Golf Enterprises	Industrial	625	813	649	+24	●	●	●	●
403-041-07	1969 S. Ritchey Street Santa Ana, CA 92705	Advanced Plant Engineering Contractors, American Senior Living, Borazzi International, California MHP Management, Carson & Company, CHC Consulting, Cocojojo, Creative Integrated Systems, Creative Transportation, Diamond Roofing, Drink Pass, EFC Foundation, Elite Nursing Services, Energy Data Surveys Vinyl Windows, Gina Skin Care, Global Life Center, Gracorp, Hartley & Associates, HEC Services, Integrated Technology Systems, JTL Design Engineering, Kelsurveys, Inc., Lamaison Construction, Motion Analysis, OBM Global Technology, Powers Marketing Group, PMG/Zoom Western/SMD, Precision Payroll, Quality Professionals, Quick Processing – Bamma USA, Readwrite Solutions, Raybit Systems, RK Solutions, Rotary Lift, RVM Engineering, Safe Realty Property Management, Sandwich Express, Secret Garden, SEOP, Inc., Shoshin USA, SIG Technologies, South District Patrol, Southwest Express, SWC, Title XI	Industrial	118	122	118	0			●	●
403-041-08	2061 S. Ritchey Street Santa Ana, CA 92705	O'Neil Storage	Industrial	12	3	12	0			●	●
427-262-06	17781 Cowan Street Irvine, CA 92614	ALG, Alzheimer's Association of Orange County, AnnexCore Marketing Agency, Caliber Collision Centers, Chrome Data, EnviroPacifica, Gradient Engineers, Home Buyer's Guide, Leighton, Terratest Labs, Vista Gardens Memory Care	Commercial	218	262	223	+5		●	●	

Table 2.1.3 Permanent Off-Street Parking Impacts Under the Build Alternatives

APN	Address	Business Name(s)	Existing Land Use	Parking Stalls				Build Alternatives			
				Existing	Required	Proposed	Diff.	Alt 1	Alt 2	Alt 3	Alt 4
427-282-14 427-282-15	17952 Cowan Street Irvine, CA 92614	Assemblies of God	Commercial	89	126	94	+5		●	●	
430-012-04	2350 Pullman Street Santa Ana, CA 92705	Sweet Life Enterprises	Industrial	66	79	89	+23			●	●
430-031-09	1717 E. Dyer Road Santa Ana, CA 92705	Motel 6	Commercial	177	190	187	+10	●	●	●	●
430-115-01	1021 Duryea Avenue Irvine, CA 92614	Cabinets Plus	Industrial	46	44	46	0			●	
430-241-07	1100 Valencia Avenue Tustin, CA 92780	RICOH	Industrial	643	582	631	-12			●	●

Source: *Off-Street Parking Study* (2014).
● = Parking impact occurs for Build Alternative
Alt = Alternative
APN = Assessor's Parcel Number
E. = East
N/A = Not applicable.
S. = South

Table 2.1.4 Consistency with General Plans

Policy	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Build Alternative
City of Tustin					
Goal 3: Support development of a network of regional transportation facilities which ensure the safe and efficient movement of people and goods from within the City to areas outside its boundaries, and which accommodate the regional travel demands of developing areas outside the City.					
Policy 3.2 Support capacity and noise mitigation improvements such as high-occupancy vehicle lanes, general purpose lanes, auxiliary lanes and noise barriers on the I-5 and SR-55 freeways.	**Consistent.** Alternative 1 would add one general-purpose lane southbound between McFadden Avenue and Edinger Avenue. Alternative 1 would also add one auxiliary lane in the northbound direction between MacArthur Boulevard and Dyer Road and between Dyer Road and Edinger Avenue, where no auxiliary lanes currently exist.	**Consistent.** Alternative 2 would add one general-purpose lane (in each direction) within the project area. Alternative 2 would also convert the existing auxiliary lane into a general-purpose lane in the northbound direction between MacArthur Boulevard and Dyer Road and in the southbound direction between Edinger Avenue and Dyer Road and between Dyer Road and MacArthur Boulevard.	**Consistent.** Alternative 3 would add one general-purpose lane (in each direction) within the project area. In addition, all existing auxiliary lanes would be maintained and additional auxiliary lanes would be added in the northbound direction between MacArthur Boulevard and Dyer Road and between Dyer Road and Edinger Avenue.	**Consistent.** Alternative 4 would add one general-purpose lane southbound between McFadden Avenue and Edinger Avenue. Alternative 4 would also add one additional HOV lane in each direction within the project area. All existing auxiliary lanes would be maintained and additional auxiliary lanes would be added in the northbound direction between MacArthur Boulevard and Dyer Road and between Dyer Road and Edinger Avenue.	**Inconsistent.** The No Build Alternative would not add HOV and/or general-purpose lanes and, thus, would not support capacity and noise mitigation improvements.
Policy 3.3 Monitor and coordinate with Caltrans freeway work as it affects Tustin's roadway and require modifications as necessary.	**Consistent.** All improvements to SR-55 under Alternative 1 are and would continue to be coordinated with the City of Tustin. The City of Tustin is part of the PDT.	**Consistent.** All improvements to SR-55 under Alternative 2 are and would continue to be coordinated with the City of Tustin. The City of Tustin is part of the PDT.	**Consistent.** All improvements to SR-55 under Alternative 3 are and would continue to be coordinated with the City of Tustin. The City of Tustin is part of the PDT.	**Consistent.** All improvements to SR-55 under Alternative 4 are and would continue to be coordinated with the City of Tustin. The City of Tustin is part of the PDT.	N/A
Policy 3.4 Maintain a proactive and assertive role with appropriate agencies dealing with regional transportation issues affecting the City.	**Consistent.** The City of Tustin is part of the PDT.	**Consistent.** The City of Tustin is part of the PDT.	**Consistent.** The City of Tustin is part of the PDT.	**Consistent.** The City of Tustin is part of the PDT.	N/A
Goal 4: Maximize the efficiency of the circulation system through the use of transportation system management and demand management strategies.					
Policy 4.3 Encourage the implementation of employer Transportation Demand Management (TDM)	**Consistent.** Alternative 1 incorporates TDM as part of the improvements.	**Consistent.** Alternative 2 incorporates TDM as part of the improvements.	**Consistent.** Alternative 3 incorporates TDM as part of the improvements.	**Consistent.** Alternative 4 incorporates TDM as part of the improvements.	**Inconsistent.** No improvements are proposed under the No Build Alternative other than

Table 2.1.4 Consistency with General Plans

Policy	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Build Alternative
requirements, which were included in the Southern California Air Quality Management District's Regulation 2202 of the 1997 Air Quality Management Plan and as required by Proposition 111 as part of the Congestion Management Program (CMP) and participate in regional efforts to implement TDM requirements.					routine maintenance.
City of Santa Ana					
Goal 1: Provide and maintain a comprehensive circulation system that facilitates the efficient movement of people and goods throughout the City, and enhances its economic viability.					
Policy 1.1 Coordinate transportation improvements in a manner which minimizes disruptions to the community.	**Consistent.** Alternative 1 would improve the operation of SR-55 and implement mitigation measures that would minimize construction impacts to local communities.	**Consistent.** Alternative 2 would improve the operation of SR-55 and implement mitigation measures that would minimize construction impacts to local communities.	**Consistent.** Alternative 3 would improve the operation of SR-55 and implement mitigation measures that would minimize construction impacts to local communities.	**Consistent.** Alternative 4 would improve the operation of SR-55 and implement mitigation measures that would minimize construction impacts to local communities.	**Inconsistent.** No improvements to SR-55 will be made and operation of the freeway will gradually deteriorate, likely distributing some traffic on local streets which in turn would permanently affect local communities.
Policy 1.2 Coordinate with the State to provide a freeway system that promotes efficient, and convenient access to City streets in a manner consistent with local land use policy.	**Consistent.** Coordination with Caltrans for Alternative 1 is conducted during PDT meetings to provide a freeway system that promotes efficient and convenient access to City of Santa Ana streets in a manner consistent with local land use policy.	**Consistent.** Coordination with Caltrans for Alternative 2 is conducted during PDT meetings to provide a freeway system that promotes efficient and convenient access to City of Santa Ana streets in a manner consistent with local land use policy.	**Consistent.** Coordination with Caltrans for Alternative 3 is conducted during PDT meetings to provide a freeway system that promotes efficient and convenient access to City of Santa Ana streets in a manner consistent with local land use policy.	**Consistent.** Coordination with Caltrans for Alternative 4 is conducted during PDT meetings to provide a freeway system that promotes efficient and convenient access to City of Santa Ana streets in a manner consistent with local land use policy.	**Inconsistent.** The No Build Alternative would not provide a freeway system that promotes efficient and convenient access to City of Santa Ana streets. Under the No Build Alternative, SR-55 would remain congested.

Table 2.1.4 Consistency with General Plans

Policy	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Build Alternative
Goal 2: Provide design and construction that facilitate safe utilization of the City's transportation systems.					
Policy 2.7 Continue design practices which facilitate the safe use of circulation systems.	**Consistent.** The Alternative 1 design includes general-purpose lanes that would facilitate the safe use of existing circulation systems and alleviate existing congested freeway conditions.	**Consistent.** The Alternative 2 design includes general-purpose lanes that would facilitate the safe use of existing circulation systems and alleviate existing congested freeway conditions.	**Consistent.** The Alternative 3 design includes general-purpose lanes that would facilitate the safe use of existing circulation systems and alleviate existing congested freeway conditions.	**Consistent.** The Alternative 4 design includes general-purpose lanes that would facilitate the safe use of existing circulation systems and alleviate existing congested freeway conditions.	**Inconsistent.** The No Build Alternative would not facilitate safe use of circulation systems because no improvements are proposed, and the freeway mainline would experience congested conditions and high accident rates.
Goal 4: Fully coordinate transportation and land use planning activities.					
Policy 4.1 Program and prioritize transportation improvements to stimulate growth in major development areas.	**Consistent.** Alternative 1 was designed to address and accommodate existing and projected growth as programmed in the 2015 FTIP and Amendment No. 2 to the RTP. The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014.	**Consistent.** Alternative 2 was designed to address and accommodate existing and projected growth as programmed in the 2015 FTIP and Amendment No. 2 to the RTP. The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014.	**Consistent.** Alternative 3 was designed to address and accommodate existing and projected growth as programmed in the 2015 FTIP and Amendment No. 2 to the RTP. The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014.	**Consistent.** Alternative 4 was designed to address and accommodate existing and projected growth as programmed in the 2015 FTIP and Amendment No. 2 to the RTP. The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014.	**Inconsistent.** The No Build Alternative would not accommodate growth occurring in major development areas in the region.
Policy 4.2 Assess land use and transportation project impacts through the development review process.	**Consistent.** Alternative 1 is subject to CEQA and NEPA development review. Land use and transportation impacts are discussed as part of the CEQA/NEPA documentation.	**Consistent.** Alternative 2 is subject to CEQA and NEPA development review. Land use and transportation impacts are discussed as part of the CEQA/NEPA documentation.	**Consistent.** Alternative 3 is subject to CEQA and NEPA development review. Land use and transportation impacts are discussed as part of the CEQA/NEPA documentation.	**Consistent.** Alternative 4 is subject to CEQA and NEPA development review. Land use and transportation impacts are discussed as part of the CEQA/NEPA documentation.	**Inconsistent.** The No Build Alternative would not necessitate assessment of land use and transportation impacts, as no construction will be proposed.
Goal 8: Strengthen the coordination of transportation and land use planning activities with adjacent jurisdictions and regional agencies.					
Policy 8.1 Participate in inter-jurisdictional planning forums and other inter-agency opportunities to coordinate transportation and land use projects.	**Consistent.** PDT meetings occur monthly to streamline discussion between the agencies and the affected cities.	**Consistent.** PDT meetings occur monthly to streamline discussion between the agencies and the affected cities.	**Consistent.** PDT meetings occur monthly to streamline discussion between the agencies and the affected cities.	**Consistent.** PDT meetings occur monthly to streamline discussion between the agencies and the affected cities.	N/A. Because no development is proposed, no planning forums or other coordination meetings are conducted.

Table 2.1.4 Consistency with General Plans

Policy	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Build Alternative
Policy 8.2 Maintain compliance with regional, state, and federal programs which provide funding for transportation improvements.	**Consistent.** The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014. The project is also included in the 2015 FTIP, which was found to be conforming by the FHWA/FTA on December 15, 2014. Regional PM_{10} SIP budget compliance was accounted for during the current approved RTP and FTIP conformity determination. Thus, Alternative 1 is in compliance with regional, State, and federal programs.	**Consistent.** The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014. The project is also included in the 2015 FTIP, which was found to be conforming by the FHWA/FTA on December 15, 2014. Regional PM_{10} SIP budget compliance was accounted for during the current approved RTP and FTIP conformity determination. Thus, Alternative 2 is in compliance with regional, State, and federal programs.	**Consistent.** The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014. The project is also included in the 2015 FTIP, which was found to be conforming by the FHWA/FTA on December 15, 2014. Regional PM_{10} SIP budget compliance was accounted for during the current approved RTP and FTIP conformity determination. Thus, Alternative 3 is in compliance with regional, State, and federal programs.	**Consistent.** The project is in Amendment No. 2 to the 2012 RTP, which was found to be conforming by the FHWA/FTA on December 15, 2014. The project is also included in the 2015 FTIP, which was found to be conforming by the FHWA/FTA on December 15, 2014. Regional PM_{10} SIP budget compliance was accounted for during the current approved RTP and FTIP conformity determination. Thus, Alternative 4 is in compliance with regional, State, and federal programs.	**Inconsistent.** The No Build Alternative would not provide improvements to SR-55 and, thus, would not be in compliance with regional, State, and federal programs that provide funding for transportation improvements.
City of Irvine					
Objective B-1 Roadway Development: Plan, provide and maintain an integrated vehicular circulation system to accommodate projected local and regional needs.					
Policy (a): Use the Circulation, Land Use and Growth Management Elements to determine roadway sizing and phasing.	**Consistent.** The City of Irvine's General Plan Circulation, Land Use, and Growth Management Elements were taken into consideration when designing the layout of Alternative 1.	**Consistent.** The City of Irvine's General Plan Circulation, Land Use, and Growth Management Elements were taken into consideration when designing the layout of Alternative 2.	**Consistent.** The City of Irvine's General Plan Circulation, Land Use, and Growth Management Elements were taken into consideration when designing the layout of Alternative 3.	**Consistent.** The City of Irvine's General Plan Circulation, Land Use, and Growth Management Elements were taken into consideration when designing the layout of Alternative 4.	**Inconsistent.** The No Build Alternative does not take into consideration growth, and the City of Irvine's General Plan Circulation, Land Use, and Growth Management Elements, and no freeway improvements will be conducted. Thus, SR-55 will continue to experience congested conditions.

Table 2.1.4 Consistency with General Plans

Policy	Alternative 1	Alternative 2	Alternative 3	Alternative 4	No Build Alternative
Policy (i): Actively lobby with appropriate state commissions, committees, and legislators for funding to upgrade the Costa Mesa, San Diego and Santa Ana Freeways.	**Consistent.** Alternative 1 proposes to add an auxiliary lane to improve traffic mobility and reduce congestion on SR-55 (the Costa Mesa Freeway).	**Consistent.** Alternative 2 proposes to add a general-purpose lane, resulting in improvements in traffic mobility and reduction of congestion on SR-55 (the Costa Mesa Freeway).	**Consistent.** Alternative 3 proposes to add a general-purpose lane, resulting in improvements in traffic mobility and reduction of congestion on SR-55 (the Costa Mesa Freeway).	**Consistent.** Alternative 4 would add one general-purpose lane southbound between McFadden Avenue and Edinger Avenue. Alternative 4 would also add one additional HOV lane in each direction within the project area. This would improve the traffic mobility on SR-55 (the Costa Mesa Freeway) and relieve congestion.	**Inconsistent.** The No Build Alternative would not upgrade SR-55 (the Costa Mesa Freeway) and, thus, would maintain the existing congested conditions.
Policy (r): Pursue local and outside funding for the implementation of the roadway system from sources.	**Consistent.** Alternative 1 is funded from federal and State sources.	**Consistent.** Alternative 2 is funded from federal and State sources.	**Consistent.** Alternative 3 is funded from federal and State sources.	**Consistent.** Alternative 4 is funded from federal and State sources.	**Inconsistent.** The No Build Alternative would not anticipate upgrades to SR-55 and, thus, would not pursue local and outside funding for the implementation of the roadway system from sources.
Objective B-2 Roadway Design: Develop a vehicular circulation system consistent with high standards of transportation engineering safety and with sensitivity to adjoining land uses.					
Policy (a): Align roadways in relationship to adjoining land uses to minimize noise and visual impacts.	**Consistent.** Alternative 1 would be aligned to minimize environmental impacts to existing land uses. Sound walls may be proposed if Alternative 1 results in noise impacts.	**Consistent.** Alternative 2 would be aligned to minimize environmental impacts to existing land uses. Sound walls may be proposed if Alternative 2 results in noise impacts.	**Consistent.** Alternative 3 would be aligned to minimize environmental impacts to existing land uses. Sound walls may be proposed if Alternative 3 results in noise impacts.	**Consistent.** Alternative 4 would be aligned to minimize environmental impacts to existing land uses. Sound walls may be proposed if Alternative 4 results in noise impacts.	**Consistent.** The No Build Alternative is aligned to existing land uses and would not result in additional noise and visual impacts

Source: *Community Impact Assessment* (2015)

Caltrans = California Department of Transportation
CEQA = California Environmental Quality Act of 1970
FHWA = Federal Highway Administration
FTA = Federal Transit Administration
FTIP = Federal Transportation Improvement Program
HOV = high-occupancy vehicle
I-5 = Interstate 5
N/A = not applicable
NEPA = National Environmental Policy Act of 1969
PDT = Project Development Team
PM_{10} = particulate matter less than 10 microns in size
RTP = Regional Transportation Plan
SIP = State Implementation Plan
SR-55 = State Route 55

Parks and Recreational Facilities

No schools, parks, or other community facilities would be acquired or otherwise affected by the Build Alternatives.

As detailed in Appendix B, the proposed project would not result in the permanent use of land from, or permanent aerial, surface, or subsurface easements at, any Section 4(f) resource. The proposed project would not result in proximity or constructive use at any of those resources that would substantially impair the activities, features, and/or attributes that qualify the resources for protection under Section 4(f). As a result, the proposed project would not trigger the requirements for protection under Section 4(f) at any publicly owned parks and recreation resources.

No Build Alternative

The No Build Alternative would not result in any improvements on the project segment of SR-55. As a result, the No Build Alternative would not result in permanent impacts related to existing and planned land uses, parks and recreation facilities, or Section 4(f) resources.

The existing condition of SR-55 in the project area is generally not consistent with the regional mobility goals and objectives of the City of Tustin, City of Santa Ana, and City of Irvine General Plan Circulation Elements. As shown in Table 2.1.4, the No Build Alternative would be generally inconsistent with the goals and policies in the cities' General Plans because the implementation of the No Build Alternative would not facilitate transportation improvements along the SR-55 corridor.

2.1.5 Avoidance, Minimization, and/or Mitigation Measures

The proposed project would not result in substantial permanent effects related to plan consistency, land use compatibility, and community facilities and services. The following measures are required to address the proposed project's temporary construction impacts related to land use conflicts:

LU-1 Prior to the commencement of construction activities above or within the Los Angeles-San Diego rail corridor (LOSSAN rail corridor), the Orange County Transportation Authority (OCTA) will coordinate with Metrolink, Amtrak, the Union Pacific Railroad, the BNSF Railway, and any other passenger or freight rail operators using the LOSSAN rail corridor to minimize railroad service delays associated with such construction activities.

The following measures would be implemented to address the proposed project's permanent impacts to off-street parking and/or landscaping:

LU-2 During property acquisition, in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), an application will be submitted to the City of Irvine, the City of Tustin, and the City of Santa Ana to obtain parking and/or landscaping variances for properties where the project would reduce the number of off-street parking stalls and/or the required amount of landscaping below the applicable municipal off-street parking and/or landscaping requirements. If variances are not granted, any severance damages to the affected parcels will be determined during the right of way acquisition process in accordance with the Uniform Act.

LU-3 During final design, design modifications that will minimize or avoid the loss of parking stalls on affected properties will continue to be researched. If such losses cannot be minimized or avoided, affected property owners will be compensated by redesigning and reconfiguring parking areas to recoup some or all of the lost parking stalls, if feasible, within existing municipal codes for setbacks, landscaping, and other site requirements. If those efforts to reduce off-street parking impacts have been exhausted and the project still results in the loss of parking stalls, all affected property owners will be compensated for the loss of parking stalls on their properties in compliance with the Uniform Act.

In addition, Measure REL-1 in Section 2.3.2.4, Avoidance, Minimization, and/or Mitigation Measures, would avoid and/or minimize the effects of the full- and partial-parcel acquisitions of property under the Build Alternatives.

2.2 Growth

2.2.1 Regulatory Setting

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

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

2.2.2 Affected Environment

Existing and General Plan land uses in the Cities of Santa Ana, Tustin, and Irvine along the project segment of State Route 55 (SR-55) were discussed earlier in Section 2.1, Land Use.

The growth impact analysis is based on the *Community Impact Assessment* (CIA) (2015) and follows the First Cut Screening guidelines provided in Caltrans' *Guidance for Preparers of Growth-Related, Indirect Impact Analyses* (February 2012).

2.2.3 Environmental Consequences

2.2.3.1 Temporary Impacts

Build Alternatives

Any potential growth-related impacts of the Build Alternatives would be permanent. There would be no temporary growth-inducing impacts under Alternatives 1, 2, 3, and 4.

No Build Alternative

No improvements to the project segment of SR-55 would be implemented under the No Build Alternative. As a result, the No Build Alternative would not result in growth-inducing impacts.

2.2.3.2 Permanent Impacts

Build Alternatives

The assessment of the potential growth-related impacts of the Build Alternatives was conducted using the first-cut screening analysis approach, including assessment of whether further analysis would be necessary based on consideration of the following four questions.

- *How, if at all, does the proposed project potentially change accessibility?*

  The Build Alternatives would reduce traffic congestion in the study area, resulting in better operations of SR-55 and local circulation. In addition, the Build Alternatives would alleviate existing deficiencies and accommodate projected future (2040) traffic volumes in the study area consistent with adopted local land use and transportation plans (those plans were discussed earlier in Section 2.1, Land Use). The Build Alternatives include improvements to an existing freeway facility and would not provide new transportation facilities or new access points to areas previously not accessible. Therefore, the Build Alternatives would not result in changes in accessibility to the transportation system in the study area.

- *How, if at all, do the project type, project location, and growth pressure potentially influence growth?*

  The Build Alternatives would accommodate approved and planned growth in the study area (refer to the list of reasonably foreseeable projects in Table 2.1.1) because they would add capacity on the project segment of SR-55, thereby reducing congestion in the study area. Pressure for growth is typically a result of a combination of factors, including economic, market, and land use demands and conditions. Growth in the Cities of Santa Ana, Tustin, and Irvine is expected to occur with or without the Build Alternatives.

  Because they would result in capacity enhancements to an existing freeway facility, the Build Alternatives may make growth in the study area more attractive. However, as shown in Table 2.1.1, a substantial number of development projects were proposed and approved prior to the initiation of the planning studies for the

SR-55 widening project, which indicates that development in the Cities of Santa Ana, Tustin, and Irvine is not dependent on completion of that freeway improvement project. Continued development of the former site of Marine Corps Air Station (MCAS) Tustin and development of vacant parcels in those three cities will depend on the health of the local economy and is likely to occur when the demand for real estate in central Orange County improves. The SR-55 corridor is in the center of an urban area. There is not a substantial amount of land in this area available for new development. Therefore, although the Build Alternatives would accommodate existing and planned growth, they would not influence growth beyond what is currently planned.

- *Is project-related growth reasonably foreseeable as defined in NEPA?*

  Under NEPA, indirect impacts need only be evaluated if they are reasonably foreseeable as opposed to remote and speculative.

  As discussed above, the Build Alternatives would not influence growth beyond those projects that are currently planned for the area (Table 2.1.1) and would not change the rate, type, or amount of growth. Therefore, no project-related growth would occur under the Build Alternatives.

- *If there is project-related growth, how, if at all, will that impact resources of concern?*

  As discussed above, because the Build Alternatives would not change the rate, type, or amount of growth, the reasonably foreseeable growth in the Cities of Tustin, Santa Ana, and Irvine is not project related.

Because the Build Alternatives would not result in growth-inducing impacts, no analysis of those potential impacts beyond the first cut screening analysis is necessary.

No Build Alternative

No improvements to SR-55 would occur under the No Build Alternative. Therefore, the No Build Alternative would not result in any permanent growth-related impacts.

2.2.4 Avoidance, Minimization, and/or Mitigation Measures

The Build Alternatives would not result in temporary or permanent growth-related impacts. 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

The National Environmental Policy Act of 1969 (NEPA), as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The Federal Highway Administration in its implementation of NEPA (23 United States Code [USC] 109(h)) directs that final decisions on projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

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

2.3.1.2 Affected Environment

This section is based on information from the *Community Impact Assessment* (CIA 2015). The study area for community character and cohesion includes portions of the cities of Tustin, Santa Ana, and Irvine, specifically the 11 census tracts adjacent to the project area (Census Tracts 525.02, 740.03, 740.04, 744.03, 744.08, 755.05, 755.07, 755.12, 755.13, 755.14, and 755.15, which are shown on Figure 2.3-1). [The figures for this section have been placed at the end of the text to enhance the section's readability.] Data presented in this section are based on census tract information available from the 2010 Census and the 2009–2013 American Community Survey (ACS).[1]

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[1] The ACS is an ongoing survey conducted by the United States Census Bureau that provides data every year, giving communities current information they need to plan investments and services. Information from the survey generates data that help determine how more than $400 billion in federal and State funds are distributed each year.

Community character refers to the degree to which the human environment is safe, healthful, productive, and aesthetically and culturally pleasing. The southern portion of the study area between Interstate 405 (I-405) and Edinger Avenue generally consists of business parks, commercial and industrial uses, and a small number of multifamily residences. By contrast, the northern portion of the study area between Edinger Avenue and First Street consists of single-family and multifamily residential, industrial, and commercial properties. Commercial and industrial uses adjacent to State Route 55 (SR-55) have been developed to take advantage of proximity to the freeway. Seventeen buildings or structures older than 45 years of age in the project Area of Potential Effects (APE) are not eligible for listing in the National Register of Historic Places (National Register) or California Register of Historical Resources (California Register), and none is a historical resource as defined by CEQA. The 11 State agency bridges within the project's APE are listed in the California Historical Significance State Agency Bridge List as Category 5 Bridges and are not eligible for the National Register. Therefore, the community character of the project area is not considered unique.

Community cohesion is the degree to which residents have a sense of belonging to their neighborhoods, a commitment to the community, and a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Some specific indicators of community cohesion are:

- **Ethnicity:** In general, homogeneity of the population contributes to higher levels of community cohesion. Communities that are ethnically homogeneous often speak the same language, hold similar beliefs, and share a common culture and therefore are more likely to engage in social interaction on a routine basis.
- **Household Size:** In general, communities with a high percentage of families with children are more cohesive than communities comprised of largely single people. This appears to be because children tend to establish friendships with other children in their community. The social networks of children often lead to the establishment of friendships and affiliations among parents in the community. Although the Census Bureau does not provide specific data regarding the number of children present in each household, the Census Bureau provides data regarding the persons per household, which can serve as a proxy for households with children.
- **Age:** In general, communities with a high percentage of elderly residents (65 years or older) tend to demonstrate a greater social commitment to their community. This is because the elderly population, which includes retirees, often

tends to be more active in the community because they have more time available for volunteering and participating in social organizations.

- **Housing Occupancy:** Communities with a high percentage of owner-occupied residences are typically more cohesive because their population tends to be less mobile. Because they have a financial stake in their community, homeowners often take a greater interest in what is happening in their community than renters do. This means they often have a stronger sense of belonging to their community.
- **Housing Tenure:** Communities with a high percentage of long-term residents are typically more cohesive because a greater proportion of the population has had time to establish social networks and develop an identity with the community.
- **Transit-Dependent Population:** Communities with a high percentage of residents who are dependent on public transportation typically tend to be more cohesive than communities that are dependent on automobiles for transportation. This is because residents who tend to walk or use public transportation for travel tend to engage in social interactions with each other more frequently than residents who travel by automobile.

These indicators of community character and cohesion in the study area and the applicable local jurisdictions are described in greater detail below.

Ethnicity

Table 2.3.1 shows the racial and ethnic composition of Orange County, the cities of Tustin, Santa Ana, and Irvine, and the 11 census tracts in the study area as reported in the 2010 Census. As shown, the racial composition of the study area census tracts varies. With the exception of Census Tracts 525.02 and 755.05, Whites account for 40 to 50 percent of the population in the study area census tracts, which is less than the County overall but generally consistent with the population of the cities of Tustin, Santa Ana, and Irvine. Census Tracts 525.02 and 755.05 have higher percentages of Whites than the County or the cities of Tustin, Santa Ana, and Irvine. Several census tracts include substantial minority populations. For example, Asians comprise approximately 31 percent of the population in Census Tract 755.15. Between 12 and 48 percent of the population in the study area census tracts identifies as some other race. Although all 11 study area census tracts contain substantial Hispanic or Latino populations, only Census Tract 744.03 exhibits a high degree of ethnic homogeneity, with Hispanics/Latinos comprising nearly 95 percent of the population in that census tract. Racial or ethnic homogeneity does not appear to be evident in any of the other census tracts in the study area.

Table 2.3.1 Racial and Ethnic Demographics

Area	White	Black	American Indian/Native Alaskan	Asian	Hawaiian/ Pacific Islanders	Other	Hispanic/ Latino
County							
Orange County	1,830,758 (60.8%)	50,744 (1.7%)	18,132 (0.6%)	537,804 (17.9%)	9,354 (0.3%)	563,440 (18.7%)	1,012,973 (33.7%)
Study Area Cities							
City of Tustin	39,729 (52.6%)	1,722 (2.3%)	442 (0.6%)	15,299 (20.3%)	268 (0.4%)	18,080 (23.8%)	30,024 (39.7%)
City of Santa Ana	148,838 (45.9%)	4,856 (1.5%)	3,260 (1.0%)	34,138 (10.5%)	976 (0.3%)	132,460 (40.8%)	253,928 (78.2%)
City of Irvine	107,215 (50.5%)	3,718 (1.8%)	355 (0.2%)	83,176 (39.2%)	334 (0.2%)	17,577 (8.1%)	19,621 (9.2%)
Study Area Census Tracts							
Census Tract 525.02 (City of Tustin)	3,846 (65.0 %)	87 (1.5%)	31 (0.5%)	1,189 (20.1%)	13 (0.2%)	747 (12.6%)	1,424 (24.1%)
Census Tract 740.03 (City of Santa Ana)	1,466 (46.7%)	50 (1.6%)	18 (0.6%)	290 (9.2%)	38 (1.2%)	31,275 (40.7%)	2,388 (76.1%)
Census Tract 740.04 (City of Santa Ana)	3,723 (50.0%)	232 (3.1%)	57 (0.8%)	1,280 (17.2%)	32 (0.4%)	2,120 (28.6%)	4,364 (58.6%)
Census Tract 744.03 (City of Santa Ana)	2,796 (49.2%)	53 (0.9%)	75 (1.3%)	147 (2.6%)	11 (0.2%)	2,606 (45.8%)	5,382 (94.6%)
Census Tract 744.08 (City of Tustin)	2,211 (41.0%)	176 (3.3%)	50 (0.9%)	322 (6.0%)	43 (0.8%)	2,597 (48.0%)	4,212 (78.0%)
Census Tract 755.05 (City of Tustin)	2,255 (62.7%)	71 (2.0%)	36 (1.0%)	416 (11.6%)	22 (0.6%)	799 (22.2%)	1,478 (41.1%)
Census Tract 755.07 (City of Tustin)	2,727 (52.6%)	162 (3.1%)	43 (0.8%)	767 (14.8%)	29 (0.6%)	1,459 (28.1%)	2,582 (49.8%)
Census Tract 755.12 (City of Tustin)	1,624 (45.8%)	91 (2.6%)	24 (0.7%)	640 (18.0%)	21 (0.6%)	1,148 (32.4%)	2,036 (57.4%)
Census Tract 755.13 (City of Tustin)	2,387 (47.0%)	192 (3.8%)	24 (0.5%)	821 (16.2%)	6 (0.1%)	1,644 (32.4%)	2,737 (53.9%)
Census Tract 755.14 (City of Tustin)	1,553 (41.9%)	88 (2.4%)	34 (0.9%)	513 (13.9%)	4 (0.1%)	1,511 (40.8%)	2,455 (66.3%)
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	6,305 (41.2%)	394 (2.6%)	90 (0.6%)	4,759 (31.1%)	70 (0.5%)	3,677 (24.0%)	5,803 (37.9%)

Source: *Community Impact Assessment* (2015).
Note: Percentages do not add up to 100 percent. The United States Census Bureau included five race categories in the 2010 Census: White, Black or African-American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander. Respondents who were unable to identify with any of these five race categories were able to identify as Some Other Race on the 2010 Census questionnaire. In addition, respondents are able to identify as more than one race or write-in detailed information about their race. According to the United States Census Bureau, persons who identify their origin as Hispanic or Latino may be of any race.

Household Size

Table 2.3.2 provides household characteristics for the study area census tracts, the cities of Tustin, Santa Ana, and Irvine, and the County, as reported in the 2010 Census and the 2009–2013 ACS. As shown, the median household income in the study area census tracts varies widely. Census Tracts 744.03, 744.08, and 755.14 are characterized by less affluent residents, with a lower median household income than the three cities and the County. Census Tracts 740.03 and 755.15 are generally consistent with the County's median household income level and near the median household income levels for the three study area cities. With the exception of Census

Table 2.3.2 Household Income and Size

Area	Median Household Income	Persons per Household
County		
Orange County	$75,422	2.99
Study Area Cities		
City of Tustin	$73,194	2.98
City of Santa Ana	$53,335	4.37
City of Irvine	$90,585	2.61
Study Area Census Tracts		
Census Tract 525.02 (City of Tustin)	$94,567	2.99
Census Tract 740.03 (City of Santa Ana)	$73,578	3.77
Census Tract 740.04 (City of Santa Ana)	$64,602	3.41
Census Tract 744.03 (City of Santa Ana)	$34,861	4.56
Census Tract 744.08 (City of Tustin)	$43,239	3.54
Census Tract 755.05 (City of Tustin)	$63,954	2.57
Census Tract 755.07 (City of Tustin)	$55,372	2.80
Census Tract 755.12 (City of Tustin)	$53,750	3.24
Census Tract 755.13 (City of Tustin)	$61,250	3.36
Census Tract 755.14 (City of Tustin)	$42,554	3.33
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	$76,591	2.92

Source: *Community Impact Assessment* (2015).

Tracts 755.05, 755.07, and 755.15, the study area census tracts have larger average household sizes than the County and the cities of Tustin and Irvine but smaller average household sizes than the City of Santa Ana. Census Tracts 755.05, 755.07, and 755.15 have smaller average household sizes than the County and the cities of Tustin and Santa Ana. Census Tract 744.03 reported the largest average household size at 4.56 persons, and Census Tract 755.05 reported the smallest average household size at 2.57 persons.

Housing Occupancy

Table 2.3.3 provides the number of housing units in the study area census tracts, the cities of Tustin, Santa Ana, and Irvine, and the County in 2010, as reported in the 2010 Census. As shown, the percentage of occupied housing units in the study area census tracts is relatively consistent with the housing occupancy rates for the County and the three cities, with the exception of Census Tract 740.03, which has a substantially lower housing occupancy rate (76 percent) than the County and the study area cities. According to the 2010 Census, the majority of the housing units in the County, the cities of Tustin and Irvine, and Census Tracts 740.03 and 740.04 are owner-occupied. In contrast, the majority of the housing units in the City of Santa Ana and Census Tracts 744.03, 744.08, 755.05, 755.07, 755.12, 755.13, 755.14, and 755.15 are renter occupied. The study area census tracts in Santa Ana have a

Table 2.3.3 Housing Profile

Area	Total Housing Units	Housing Units Occupied	Owner-Occupied Housing Units	Renter-Occupied Housing Units
County				
Orange County	1,042,254	984,503 (95%)	599,032 (61%)	385,471 (39%)
Study Area Cities				
City of Tustin	26,335	24,839 (94%)	13,109 (53%)	11,730 (47%)
City of Santa Ana	77,796	74,381 (96%)	36,613 (49%)	37,768 (51%)
City of Irvine	76,184	74,680 (94%)	38,124 (53%)	33,556 (47%)
Study Area Census Tracts				
Census Tract 525.02 (City of Tustin)	2,001	1,969 (98%)	1,675 (85%)	294 (15%)
Census Tract 740.03 (City of Santa Ana)	916	694 (76%)	694 (62%)	261 (38%)
Census Tract 740.04 (City of Santa Ana)	2,355	2,312 (98%)	1,184 (51%)	1,128 (49%)
Census Tract 744.03 (City of Santa Ana)	1,345	1,291 (96%)	367 (28%)	924 (72%)
Census Tract 744.08 (City of Tustin)	1,640	1,559 (95%)	512 (33%)	1,047 (67%)
Census Tract 755.05 (City of Tustin)	1,474	1,387 (94%)	584 (42%)	803 (58%)
Census Tract 755.07 (City of Tustin)	2,010	1,843 (92%)	419 (23%)	1,424 (77%)
Census Tract 755.12 (City of Tustin)	1,194	1,092 (91%)	347 (32%)	745 (68%)
Census Tract 755.13 (City of Tustin)	1,583	1,552 (98%)	607 (39%)	903 (61%)
Census Tract 755.14 (City of Tustin)	1,216	1,208 (99%)	189 (16%)	1,019 (84%)
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	4,155	3,833 (92%)	1,374 (36%)	2,459 (64%)

Source: *Community Impact Assessment* (2015).

substantially lower percentage of owner-occupied housing units than the County and the study area cities.

Age of Population

Table 2.3.4 shows the age distribution, including the median age, of the population in the County, the cities of Tustin, Santa Ana, and Irvine, and the study area census tracts, as reported in the 2010 Census. A higher median age is often characteristic of a more mature and affluent community, while a lower median age is often characteristic of a less mature, less affluent community. The majority of the study area census tracts reported median ages lower than the County and the study area cities, with the exception of Census Tract 525.02, which has a higher median age than that of the County and the City of Tustin.

Table 2.3.4 Age Distribution

Area	Median Age	Population		
		< 16 Years Old	16–64 Years Old	> 64 Years Old
County				
Orange County	36.2	21.4%	66.9%	11.6%
Study Area Cities				
City of Tustin	33.4	23.8%	67.7%	8.5%
City of Santa Ana	29.1	27.3%	66.0%	6.8%
City of Irvine	33.9	19.0%	72.4%	8.7%
Study Area Census Tracts				
Census Tract 525.02 (City of Tustin)	40.9	19.2%	65.7%	15.1%
Census Tract 740.03 (City of Santa Ana)	29.1	25.5%	69.9%	4.6%
Census Tract 740.04 (City of Santa Ana)	32.0	21.0%	70.9%	8.0%
Census Tract 744.03 (City of Santa Ana)	23.9	36.2%	61.2%	2.7%
Census Tract 744.08 (City of Tustin)	28.3	30.1%	65.3%	4.6%
Census Tract 755.05 (City of Tustin)	37.3	20.2%	67.0%	12.8%
Census Tract 755.07 (City of Tustin)	31.1	21.4%	71.4%	7.2%
Census Tract 755.12 (City of Tustin)	29.8	23.5%	69.9%	6.6%
Census Tract 755.13 (City of Tustin)	31.3	24.4%	68.8%	6.8%
Census Tract 755.14 (City of Tustin)	29.5	25.7%	68.0%	6.3%
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	29.9	23.5%	72.3%	4.2%

Source: *Community Impact Assessment* (2015).

Unlike the majority of the study area census tracts, which have age distributions that are slightly younger than the County and the study area cities, Census Tract 744.03 has a high proportion (36.2 percent) of its population under the age of 16. Census Tract 744.03 also has a substantially younger median age (23.9) than the County, the study area cities, and the other study area census tracts. Census Tract 525.02 (15.1 percent) and Census Tract 755.05 (12.8 percent) have higher proportions of their populations over the age of 65 than the County and the three cities in the study area.

Transit Dependency

The transit-dependent population is typically described as the population that relies on public transportation for travel. The transit-dependent population may include the disabled, the elderly, the young, low-income individuals, and households without vehicles available. Given that transit dependency can be attributed to a combination of factors, including age, income level, and ability to drive, transit-dependent populations are often difficult to identify based on census data because these groups often overlap. In an effort to avoid double counting such populations, the transit-dependent population was calculated by determining the number of persons in households that are eligible to drive but do not have access to a vehicle. This number was derived by taking the number of residents aged 15 and over (the approximate population eligible to drive) within a geographic area, subtracting the number of

persons living in group quarters (e.g., college residence halls, skilled nursing facilities, correctional facilities, and other group living environments where driving is not typically required), subtracting the number of vehicles available, and then dividing the result by the population aged 15 and over.

Table 2.3.5 shows the percentage of transit-dependent population in the County, the study area cities, and the study area census tracts. As shown in Table 2.3.5, 18.1 percent of the County's population is transit dependent. The percentage of transit-dependent population in the City of Tustin (21.0 percent) is similar to that in the County (18.1 percent); however, in the City of Santa Ana, the percentage of transit-dependent population is much greater (37.0 percent). Of the 11 census tracts in the study area, 9 exhibit higher transit-dependent populations than the County (18.1 percent), with the exception of Census Tract 525.02 (17.9 percent) and Census Tract 755.05 (16.8 percent). Census Tracts 744.03, 755.13, and 755.14 have higher percentages of transit-dependent residents (49.6 percent, 38.8 percent, and 38.3 percent, respectively) than the City of Santa Ana.

Table 2.3.5 Transit Dependency

Area	Transit-Dependent Population[1]
County	
County of Orange	18.1%
Study Area Cities	
City of Tustin	21.0%
City of Santa Ana	37.0%
City of Irvine	13.9%
Study Area Census Tracts	
Census Tract 525.02 (City of Tustin)	17.9%
Census Tract 740.03 (City of Santa Ana)	32.2%
Census Tract 740.04 (City of Santa Ana)	24.8%
Census Tract 744.03 (City of Santa Ana)	49.6%
Census Tract 744.08 (City of Tustin)	35.0%
Census Tract 755.05 (City of Tustin)	16.8%
Census Tract 755.07 (City of Tustin)	26.4%
Census Tract 755.12 (City of Tustin)	28.8%
Census Tract 755.13 (City of Tustin)	38.8%
Census Tract 755.14 (City of Tustin)	38.3%
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	21.1%

Source: *Community Impact Assessment* (2015).

[1] The transit-dependent population was calculated by taking the number of residents aged 15 and over (as reported in Table B01001 of the 2009–2013 ACS), subtracting the number of persons living in group quarters (as reported in Table B26001 of the 2009–2013 ACS), subtracting the number of vehicles available (as reported in Table B25046 of the 2009–2013 ACS), and then dividing the difference by the population aged 15 and over.

Housing Tenure

Housing tenure is shown in Table 2.3.6. As shown in Table 2.3.6, 34.9 percent of the County's residents have lived in their current residences for more than 10 years and, therefore, can be considered long-term residents. Similar to the County, a large percentage (33.8 percent) of the population in the City of Santa Ana consists of long-term residents. By comparison, the cities of Tustin and Irvine have relatively lower percentages of long-term residents (25.8 percent and 21.8 percent, respectively).

Table 2.3.6 Housing Tenure

Area	Year Householder Moved Into Unit		
	2010 or Later	2000–2009	Moved in 1999 or Earlier (Long-Term Residents)
County			
Orange County	187,513 (18.8%)	460,798 (46.3%)	347,201 (34.9%)
Study Area Cities			
City of Tustin	5,718 (22.9%)	12,822 (51.3%)	6,432 (25.8%)
City of Santa Ana	14,109 (19.3%)	34,196 47.0%)	24,606 (33.8%)
City of Irvine	21,274 (26.2%)	42,153 (52.0%)	17,631 (21.8%)
Study Area Census Tracts			
Census Tract 525.02 (City of Tustin)	63 (3.2%)	767 (39.5%)	1,111 (57.3%)
Census Tract 740.03 (City of Santa Ana)	375 (40.1%)	385 (41.1%)	176 (18.8%)
Census Tract 740.04 (City of Santa Ana)	408 (18.7%)	1,046 (48.0%)	725 (33.3%)
Census Tract 744.03 (City of Santa Ana)	175 (13.6%)	886 (68.7%)	229 (17.7%)
Census Tract 744.08 (City of Tustin)	446 (28.9%)	894 (57.9%)	203 (13.2%)
Census Tract 755.05 (City of Tustin)	391 (28.7%)	641 (47.1%)	329 (24.2%)
Census Tract 755.07 (City of Tustin)	631 (32.8%)	974 (50.6%)	319 (16.5%)
Census Tract 755.12 (City of Tustin)	354 (33.1%)	475 (44.4%)	242 (22.5%)
Census Tract 755.13 (City of Tustin)	381 (25.7%)	730 (49.2%)	374 (25.1%)
Census Tract 755.14 (City of Tustin)	343 (29.0%)	639 (54.1%)	199 (16.9%)
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	1,672 (31.5%)	3,225 (60.7%)	405 (7.9%)

Source: *Community Impact Assessment* (2015).

Census Tracts 740.04, 755.05, 755.12, and 755.13 have moderate percentages of long-term residents (between 22.5 and 33.3 percent). The percentages of long-term residents in the other four study area census tracts are lower than for the County and the study area cities. Census Tract 525.02 has a much larger concentration of long-term residents (57.3 percent) than the County or the study area cities.

Community Cohesion Summary

Indicators for a community that has a high degree of cohesion are high rates of home ownership and ethnic homogeneity, and high percentages of transit-dependent residents, elderly residents, long-term residents, and households of two or more people. Census Tract 744.03 has a larger average household size (4.56 persons), a higher degree of ethnic homogeneity (approximately 95 percent of the population is Hispanic or Latino), and a higher percentage of transit-dependent population (49.6 percent) than the County and the study area cities; however, Census Tract 744.03 also demonstrates several characteristics that indicate its population is highly transient (i.e., low proportion of owner-occupied residences and relatively short housing tenure). Census Tract 525.02 has a high rate of owner-occupied residences, above-average homogeneity (approximately 65 percent of the population is White), higher percentages of its population over 65 (15.1 percent), and long-term residents (57.3 percent) than the County and the City of Tustin. Based on these factors, Census Tracts 525.02 and 744.03 are concluded to have reasonably high levels of community cohesion. Community cohesion is relatively low within the other study area census tracts.

2.3.1.3 Environmental Consequences

Temporary Impacts

Build Alternatives

Impacts to community cohesion generally depend on whether a project is likely to create a barrier or disrupt connectivity of a community. Either of these can be a result of disruptions in access or residential and business acquisitions. As described below, construction of the Build Alternatives would potentially affect community character and cohesion through the temporary use of land from privately owned properties for use as temporary construction easements (TCEs), short-term air quality and noise effects, and temporary road and ramp closures/detours along and in the immediate vicinity of the project segment of SR-55.

The Build Alternatives would require TCEs on small parts of the rear of several parcels in the residential neighborhoods along SR-55, north of the Los Angeles to San Diego (LOSSAN) high-speed rail corridor. As a result, the extent of temporary impacts to residential uses adjacent to the project area would be limited. Construction of the Build Alternatives would also require TCEs on commercial and industrial properties in the project area. Given that most of these TCEs would be located on land that is currently being used for landscaping and parking lots adjacent to the existing SR-55 right of way (ROW), the temporary use of such land for construction

activities would neither result in adverse effects on community character nor have the potential to divide an existing community or create any barriers between existing communities.

Construction activities would result in temporary impacts associated with construction equipment noise and air emissions at residences and businesses adjacent to SR-55. These impacts would be temporary and would cease when the project construction is complete.

All the Build Alternatives would require overnight closures of the southbound SR-55 mainline between MacArthur Boulevard and I-405 and between Dyer Road and MacArthur Boulevard, and overnight closures of the northbound mainline between Edinger Avenue and McFadden Avenue. Detour routes would be provided to direct traffic around these mainline closures using the local arterial street network. The potential detours would result in increased travel times ranging from approximately 5 to 9 minutes.

All the Build Alternatives would require overnight ramp closures. Alternative 3 would require the greatest number of ramp closures (20), and Alternative 1 would require the least number of ramp closures (12). Alternatives 2 and 4 would each require the closure of 19 ramps. Because each ramp closure is not expected to exceed 10 nights, they would not cause excessive inconvenience to the traveling public. No two consecutive off-ramps or two consecutive on-ramps in the same direction would be closed concurrently.

Overnight closures on MacArthur Boulevard, Dyer Road, and Edinger Avenue would be required for all four Build Alternatives. No other local street closures would be required. As with the mainline closures, detour routes on other local streets would be provided to direct traffic around the closures. The potential detour routes would result in increased travel times ranging from approximately 4 to 12 minutes.

All mainline, arterial, and ramp closures would occur only during the overnight hours between 10:00 p.m. and 5:00 a.m. and on a short-term basis. The total number of overnight closures at each mainline and arterial location is not anticipated to exceed three nights (closures will not occur on consecutive nights). The total number of overnight closures at each ramp location is not anticipated to exceed 10 nights (closures may or may not occur on consecutive nights). Adequate notification of all mainline, arterial, and ramp closures would be provided to the public and local government agencies.

Access to all nearby businesses would be maintained during mainline, ramp, and arterial closures. All businesses would be accessible from alternate freeway off-ramps and by using local streets. Given that the closures would be short term and confined to the nighttime hours, the increased travel times and distances would result in minimal disruption to neighborhoods and businesses adjacent to the project area and would not divide the study area cities or neighborhoods in those cities. Nevertheless, construction-related closures could impede movement within the study area cities, which would result in temporary adverse effects to community character and cohesion. Although community members would still be able to use community services and facilities during the construction period, there would be some degree of inconvenience due to construction-related delays, temporary closures, and construction equipment operation.

No Build Alternative

No improvements to SR-55 other than routine maintenance are proposed under the No Build Alternative. Therefore, the No Build Alternative would not result in temporary impacts related to businesses and community character and cohesion.

Permanent Impacts

The Build Alternatives would result in beneficial impacts related to community character and cohesion in terms of improved access and connectivity and decreased travel times. In addition, emergency services in the three cities (e.g., fire and police protection) would be more readily available with the Build Alternatives because mobility in the study area would improve over existing conditions. The Build Alternatives would provide improvements on a segment of SR-55 that has been in operation since its construction in 1962. Therefore, the Build Alternatives would not create any new or exacerbate any existing physical divisions in the study area or in the cities in the study area.

Under Alternatives 3 and 4, the northbound McFadden on-ramp would be restricted to the northbound I-5 connector only. As a result, direct access from the northbound McFadden Avenue on-ramp to northbound SR-55 and southbound Interstate 5 (I-5) would be eliminated. As a result, motorists in the vicinity of the McFadden Avenue on-ramp intending to travel to northbound SR-55 would mainly use Newport Avenue and Red Hill Avenue to enter northbound I-5 before connecting to northbound SR-55, while some motorists would use the Edinger Avenue and Dyer Road on-ramps to access northbound SR-55. Most of the motorists in the vicinity of the McFadden Avenue on-ramp intending to travel to southbound I-5 would enter southbound I-5

from the Red Hill Avenue on-ramp. Although Alternative 3 would require some motorists to follow a different travel path to access northbound SR-55 and southbound I-5 and would result in minor travel delays for some motorists, Alternative 3 would not create a barrier to traffic movements in the study area because motorists would still be able to access northbound SR-55 and southbound I-5 via other nearby interchanges.

As described in Section 2.6, Visual/Aesthetics, implementation of the Build Alternatives would result in moderately low permanent visual impacts from project-related activities. SR-55 is an existing facility in a highly developed area. Improvements proposed by this project would not deteriorate the existing visual quality or character of the project corridor and surrounding area. In many locations along the project segment of SR-55, visual quality is anticipated to improve as a result of the undergrounding existing overhead utility lines. Further, the final design of new retaining walls and sound walls provided by the project would feature architectural treatments and features to minimize the loss of, and improve the visual quality on, the project segment of SR-55. Additionally, a project-specific Landscape Plan will be implemented to address landscape treatments within the State ROW along the project segment of SR-55.

As described in detail later in Section 2.3.2, Relocation and Real Property Acquisition, the Build Alternatives would result in limited property acquisition in the project area. None of the Build Alternatives would result in residential displacements. Property acquisitions for Alternatives 1 and 2 would result in the displacement of one business: Rockin' Jump (an indoor trampoline facility). Alternatives 3 and 4 would result in the displacement of Rockin' Jump and two additional businesses: Western Exterminator Company (a termite and pest control company) and Above & Beyond, Inc. (a manufacturer of outdoor advertising products). Because these companies provide specialized services that are likely to be marketed to the broader region rather than simply the adjacent communities, and Rockin' Jump is a relatively new business to the area, their relocation is not anticipated to result in any damage or disruption to the social fabric of the communities in which they are located.

In summary, the Build Alternatives would not divide existing communities by creating a barrier to traffic movements. The Build Alternatives would result in beneficial impacts related to community character and cohesion in terms of improved access and connectivity and decreased travel times. The existing visual quality or character of the project corridor and surrounding area would not be deteriorated, and

in many locations is anticipated to improve by undergrounding the existing overhead utility lines. None of the business displacements that would be required by the Build Alternatives would impact the cohesion of the communities in which they are located. Thus, permanent community character and cohesion impacts as a result of the Build Alternatives would be minimal.

No Build Alternative

No improvements to existing SR-55 other than routine maintenance are proposed under the No Build Alternative. Therefore, the No Build Alternative would not relieve existing traffic congestion on SR-55. Future increases in traffic congestion under the No Build Alternative would result in permanent impacts to community character and cohesion in the communities adjacent to the project segment of SR-55.

2.3.1.4 Avoidance, Minimization, and/or Mitigation Measures

Measure REL-1, provided later in Section 2.3.2.4, would minimize the effects of the full and partial acquisitions of property under the Build Alternatives related to community character and cohesion.

Temporary construction impacts would be minimized based on implementation of Measure T-1, which is provided in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities. Measure T-1 requires development and implementation of a Transportation Management Plan (TMP) during construction of the Build Alternatives to address traffic delays; maintain traffic flow in the SR-55 corridor; manage detours and temporary road, lane, and ramp closures; provide ongoing information to the public regarding construction activities, closures, and detours; and maintain a safe environment for construction workers and travelers.

Temporary air quality impacts would be minimized based on implementation of Measures AQ-1 through AQ-5, which are provided in Section 2.13, Air Quality. These measures require the control of dust and equipment emissions during construction of the Build Alternatives.

Temporary noise impacts would be minimized based on implementation of Measure N-1, which is provided in Section 2.14, Noise. Measure N-1 requires the construction contractor to comply with California Department of Transportation (Caltrans) Standard Specifications regarding noise control during construction of the Build Alternatives.

2.3.2 Relocations and Real Property Acquisition

2.3.2.1 Regulatory Setting

The Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) (Uniform Act) 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. Please see Appendix D for a summary of the RAP.

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

2.3.2.2 Affected Environment

The information in this section is summarized from the *Community Impact Assessment* (2015) and the *Draft Relocation Impact Statement* (DRIS) (2015).

As shown previously in Figure 2.3-1, the study area for the assessment of the project effects related to property acquisition and relocation was defined as 11 Census Tracts (Census Tracts 525.02, 740.03, 740.04, 744.03, 744.08, 755.05, 755.07, 755.12, 755.13, 755.14, and 755.15) in the cities of Tustin, Santa Ana, and Irvine. This study area was selected because it covers the entire project area and includes areas in the vicinity of the project area that are likely to be considered for the relocation of businesses displaced by the Build Alternatives. As described earlier in Section 2.1, Land Use, the existing land uses in the study area include primarily multifamily residential, office, commercial, and industrial uses, and limited amounts of vacant land. Existing land uses in the southern part of the study area between I-405 and Edinger Avenue generally consist of commercial and industrial uses, and a small number of multifamily residential uses. The northern part of the study area between Edinger Avenue and I-5 is dominated by multifamily residential and commercial properties.

2.3.2.3 Environmental Consequences

Temporary Impacts

Alternative 1

As shown on Figure 2.3-2, Alternative 1 would require TCEs on 21 residential, commercial, and industrial parcels to allow access for the construction of sound walls, retaining walls, and roadway widening. Given that most of these TCEs generally consist of land that is currently being used for landscaping and parking lots, temporary impacts would be limited to parking impacts. Alternative 1 would also require TCEs on two flood control parcels and one railroad parcel in order to place pre-cast concrete box girders above the Santa Ana-Santa Fe Channel and the LOSSAN high-speed rail corridor so that the South Tustin Overhead Bridge can be widened.

Construction staging areas may be located on a vacant parcel adjacent to the northbound SR-55 off-ramp to Edinger Avenue and in State ROW along southbound SR-55 north of McFadden Avenue.

After construction, the TCEs and staging areas used for any Build Alternative would be restored to their original pre-project conditions. TCEs and staging areas would not require businesses, employees, or residents to relocate. Owners of the parcels affected by TCEs and staging areas would be compensated for temporary use of their property during construction. For these reasons, temporary ROW acquisition impacts are not anticipated to be substantial. As a result, the temporary use of land during construction of the Build Alternatives would not result in substantial impacts.

Alternative 2

As shown on Figure 2.3-3, Alternative 2 would require TCEs on 40 residential, commercial, and industrial parcels to accommodate the construction of sound walls, retaining walls, and roadway widening. Given that most of these TCEs generally consist of land that is currently being used for landscaping and parking lots, temporary impacts would be limited to parking impacts. Alternative 2 would require TCEs on three flood control parcels and two railroad parcels, and may require construction staging areas on a vacant parcel and in State ROW.

After construction, the TCEs and staging areas would be restored to their original pre-project conditions as described above for Alternative 1.

Alternative 3

As shown on Figure 2.3-4, Alternative 3 would require TCEs on 53 residential, commercial, and industrial parcels to accommodate the construction of sound walls, retaining walls, and roadway widening. Given that most of these TCEs generally consist of land that is currently being used for landscaping and parking lots, temporary impacts would be limited to parking impacts, as described in Section 2.3.1. Similar to Alternative 2, Alternative 3 would require TCEs on three flood control parcels and two railroad parcels, and may require construction staging areas on a vacant parcel and in State ROW.

After construction, the TCEs and staging areas would be restored to their original pre-project conditions as described above for Alternative 1.

Alternative 4

As shown on Figure 2.3-5, Alternative 4 would require TCEs on 43 residential, commercial, and industrial parcels in order to accommodate the construction of sound walls, retaining walls, and roadway widening. Given that most of these TCEs generally consist of land that is currently being used for landscaping and parking lots, temporary impacts would be limited to parking impacts, as described in Section 2.3.1. Similar to Alternative 2, Alternative 4 would require TCEs on three flood control parcels and two railroad parcels, and may require construction staging areas on a vacant parcel and in State ROW.

After construction, the TCEs and staging areas would be restored to their original pre-project conditions as described above for Alternative 1.

No Build Alternative

The No Build Alternative would not include any construction and therefore would not require the use of any privately owned land for TCEs or staging areas.

Permanent Impacts

Alternative 1

As shown on Figure 2.3-2 and in Table 2.3.7, Alternative 1 would result in the full acquisition of four vacant parcels. Because these full acquisitions would be limited to vacant parcels, no business displacements would occur. Alternative 1 would also result in the partial acquisition of seven non-residential properties, one of which would result in the demolition of one occupied building, resulting in the displacement of one business (Rockin' Jump). Alternative 1 would not require partial

Table 2.3.7 Full and Partial Acquisitions Anticipated Under Alternative 1

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
402-101-45	2101 E. Edinger Avenue Santa Ana, CA 92705	Freeway Honda	Commercial	Partial	1,480	No
402-111-24	1411 Village Way Santa Ana, CA 92705	Advanced Office Services, The Baseball Academy, Calumet Photographic, CubeKing, Enterprise Fleet Services, Liquid Handling, Monkeysports, Motorvac Technologies, Roger Dunn Golf Shop, Sender One Climbing, The Wine Club, Worldwide Golf Enterprises, Rockin' Jump	Commercial	Partial	32,769	Yes
430-012-03	2400 S. Pullman Street Santa Ana, CA 92705	Above & Beyond, Inc.	Industrial	Partial	1,729	No
430-012-04	2350 Pullman Street Santa Ana, CA 92705	Sweet Life Enterprises	Industrial	Partial	4,578	No
430-031-09	1717 E. Dyer Road Santa Ana, CA 92705	Motel 6	Commercial	Partial	4,155	No
430-241-07	1100 Valencia Avenue Tustin, CA 92780	RICOH	Industrial	Partial	15,883	No
430-241-12	1123 Warner Avenue Tustin, CA 92780	N/A	Industrial	Partial	15,603	No
016-221-27	1580 E. Warner Avenue Santa Ana, CA 92705	N/A	Vacant	Full	76,760	No
016-221-28	Brookhollow Drive Santa Ana, CA 92705	N/A	Vacant	Full	37,426	No
016-221-29	S. Grand Avenue Santa Ana, CA 92705	N/A	Vacant	Full	9,055	No
411-141-06	Santa Ana, CA 92705	N/A	Vacant	Full	6,547	No

Source: *Community Impact Assessment* (2015).
E. = East
N/A = Not Applicable
S. = South
sf = square feet

or full acquisition of residential properties. Therefore, no residential displacements would occur.

The displacement of one business in the City of Santa Ana would displace approximately 20 employees, which represents approximately 0.01 percent of the total number of employees in the City of Santa Ana. However, based on the DRIS, there are several locations available in the study area cities for relocation of the displaced business. As of August 2015, there were 332 offices for lease and 62 for sale in the study area cities that could serve as replacement properties for the displaced business. Therefore, there is an adequate supply of available replacement properties in which to relocate the displaced business within the study area cities, and it is anticipated that the business would be relocated near its current location.

The full acquisition of the four nonresidential parcels in the City of Santa Ana would result in property tax revenue losses for local taxing agencies because these parcels would be removed from the property tax assessment roll. The full parcel acquisitions under Alternatives 1 would result in the loss of an estimated $4,587 in annual property tax revenue to the City of Santa Ana, which is approximately 0.01 percent of the City of Santa Ana's total annual property tax revenue. The County, the Santa Ana and Tustin Unified School Districts, and other local taxing agencies that receive a share of property taxes from these parcels would also be affected. Partial acquisitions in the cities of Tustin and Santa Ana would result in additional minor reductions in the local property tax assessment roll, further decreasing property tax collections.

The partial acquisitions associated with Alternative 1 would result in the displacement of one sales tax-generating business within the City of Santa Ana. As discussed above, there is an adequate supply of available replacement properties in which to relocate the displaced business within the study area cities. In the event that the displaced business was relocated within the City of Santa Ana, there would be no net loss of sales tax revenue to that city. However, relocation to a different city would result in a net loss of sales tax revenue to the City of Santa Ana. As shown in Table 2.3.8, the potential annual sales tax revenue loss would be $4,064 for the City of Santa Ana if the business was relocated outside of Santa Ana, and $1,355 for the County and $2,709 for the Orange County Transportation Authority (OCTA) if it was relocated outside of Orange County. Should undergrounding of utilities be required, a permanent easement may be necessary.

Table 2.3.8 Potential Annual Sales Tax Revenue Losses Related to Business Displacements in the City of Santa Ana for Alternatives 1 and 2

Jurisdiction	Tax Rate	Taxable Sales	Total Sales Tax Revenue	Business Permits	Average Sales Tax/Business	Sales Tax Loss
City of Santa Ana	0.75%	$3,655,025,000	$27,412,688	$6,745	$4,064	$4,064
Orange County Transportation Fund	0.25%	—	$9,137,563	—	$1,355	$1,355
OCTA (Measure M)	0.50%	—	$18,275,125	—	$2,709	$2,709

Source: *Community Impact Assessment* (2015).
Note: This table represents the maximum sales tax loss that could occur if the displaced business was relocated outside of Orange County.
OCTA = Orange County Transportation Authority

Alternative 2

As shown on Figure 2.3-3 and in Table 2.3.9, Alternative 2 would result in the full acquisition of the same four vacant parcels as Alternative 1. Alternative 2 would also result in the partial acquisition of 16 non-residential properties.

Table 2.3.9 Full and Partial Acquisitions Anticipated Under Alternative 2

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
402-101-45	2101 E. Edinger Avenue Santa Ana, CA 92705	Freeway Honda	Commercial	Partial	1,480	No
402-111-24	1411 Village Way Santa Ana, CA 92705	Advanced Office Services, The Baseball Academy, Calumet Photographic, CubeKing, Enterprise Fleet Services, Liquid Handling, Monkeysports, Motorvac Technologies, Roger Dunn Golf Shop, Sender One Climbing, The Wine Club, Worldwide Golf Enterprises, Rockin' Jump	Commercial	Partial	32,769	Yes
427-261-05	17942 Cowan Irvine, CA 92614	N/A[1]	Commercial	Partial	2,177	No
427-261-06	17912 Cowan Irvine, CA 92614	N/A[1]	Industrial	Partial	2,763	No
427-261-07	17872 Cowan Irvine, CA 92614	N/A[1]	Industrial	Partial	3,010	No
427-261-08	17842 Cowan Irvine, CA 92614	N/A[1]	Industrial	Partial	3,000	No
427-261-09	17792 Cowan B Irvine, CA 92614	N/A[1]	Industrial	Partial	3,204	No
427-261-10	17792 Cowan A Irvine, CA 92614	N/A[1]	Industrial	Partial	4,503	No
427-262-06	17781 Cowan Irvine, CA 92614	ALG, Alzheimer's Association of Orange County, AnnexCore Marketing Agency, Caliber Collision Centers, Chrome Data, EnviroPacifica, Gradient Engineers, Home Buyer's Guide, Leighton, Terratest Labs, Vista Gardens Memory Care	Commercial	Partial	4,988	No
427-282-14	17952 Cowan Irvine, CA 92614	Assemblies of God	Commercial	Partial	1,141	No
427-282-15	17952 Cowan Irvine, CA 92614	Assemblies of God	Commercial	Partial	3,684	No
430-012-03	2400 S. Pullman St. Santa Ana, CA 92705	Above & Beyond, Inc.	Industrial	Partial	1,729	No
430-012-04	2350 Pullman Street Santa Ana, CA 92705	Sweet Life Enterprises	Industrial	Partial	4,578	No
430-031-09	1717 E. Dyer Road Santa Ana, CA 92705	Motel 6	Commercial	Partial	4,155	No
430-241-07	1100 Valencia Avenue Tustin, CA 92780	RICOH	Industrial	Partial	15,883	No
430-241-12	1123 Warner Avenue Tustin, CA 92780	N/A	Industrial	Partial	15,603	No
016-221-27	1580 E. Warner Avenue Santa Ana, CA 92705	N/A	Vacant	Full	76,760	No
016-221-28	Brookhollow Drive Santa Ana, CA 92705	N/A	Vacant	Full	37,426	No
016-221-29	S. Grand Avenue Santa Ana, CA 92705	N/A	Vacant	Full	9,055	No
411-141-06	Santa Ana, CA 92705	N/A	Vacant	Full	6,547	No

Source: *Community Impact Assessment* (2015).
E. = East S. = South
N/A = Not Applicable sf = square feet

Similar to Alternative 1, Alternative 2 would result in the demolition of one occupied building, resulting in the displacement of one business (Rockin' Jump). Alternative 2 would not require partial or full acquisition of residential properties. Therefore, no residential displacements would occur.

Alternative 2 would result in the same employee displacements as Alternative 1. The 20 displaced employees represent approximately 0.01 percent of the total number of employees in the City of Santa Ana's employed labor force. As discussed previously, there are several available locations in which to relocate the displaced business within the study area cities; therefore, it is anticipated that the business would be relocated near its current location.

Alternative 2 would result in the same property tax and sales tax losses as Alternative 1, as shown in Table 2.3.8. Should undergrounding of utilities be required, a permanent easement may be necessary.

Alternative 3

As shown on Figure 2.3-3 and in Table 2.3.10, Alternative 3 would result in the full acquisition of eight nonresidential parcels. Six of those parcels are currently vacant and therefore would not result in business displacements. The other two full parcel acquisitions would result in the displacement of two businesses (Western Exterminator Company and Above & Beyond, Inc.). Alternative 3 would also result in the partial acquisition of 30 non-residential properties. Similar to Alternatives 1 and 2, one of the partial acquisitions for Alternative 3 would result in the demolition of one occupied building, resulting in the displacement of one business (Rockin' Jump). Alternative 3 would not require full acquisition of residential properties. Therefore, no residential displacements would occur.

The displacement of the three businesses in the City of Santa Ana would displace approximately 90 employees (20 at Rockin' Jump, 50 at the Western Exterminator Company, and 20 at Above & Beyond, Inc.), which represents approximately 0.06 percent of the total employed labor force in the City of Santa Ana. However, as discussed previously, there are several locations available in the study area cities for relocation of the displaced businesses. As discussed previously, there is an adequate supply of available replacement properties in which to relocate the displaced businesses within the study area cities, and it is anticipated that businesses would be relocated near their current locations.

Table 2.3.10 Full and Partial Acquisitions Anticipated Under Alternative 3

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
016-221-12	Brookhollow Drive Santa Ana, CA 92705	N/A[1]	Commercial	Partial	6,813	No
016-221-13	Brookhollow Drive Santa Ana, CA 92705	N/A[1]	Commercial	Partial	3,818	No
016-221-14	1570 E. Warner Avenue Santa Ana, CA 92705	N/A[1]	Commercial	Partial	1,045	No
402-101-45	2101 E. Edinger Avenue Santa Ana, CA 92705	Freeway Honda	Commercial	Partial	1,480	No
402-111-24	1411 Village Way Santa Ana, CA 92705	Advanced Office Services, The Baseball Academy, Calumet Photographic, CubeKing, Enterprise Fleet Services, Liquid Handling, Monkeysports, Motorvac Technologies, Roger Dunn Golf Shop, Sender One Climbing, The Wine Club, Worldwide Golf Enterprises, Rockin' Jump	Commercial	Partial	32,769	Yes
403-041-04	1929 E. St. Andrew Place Santa Ana, CA 92705	N/A[1]	Industrial	Partial	3,258	No
403-041-07	1969 S. Ritchey Street Santa Ana, CA 92705	A-1 Shower Door, Andrade's, Applied Flow Technologies, Berry Sheet Metal, CPS Solutions, Fred's Custom Draperies, GD Designs, H&R Upholstery, J.E. Steel Rule Die, Junk Monster, Monarch Precision Deburring, Olama Products, Serena D'Italia, Speedway, Stedco Engineering, Sunny Hills Cleans, Water Jetting Equipment	Industrial	Partial	3,546	No
403-041-08	2061 S. Ritchey Street Santa Ana, CA 92705	O'Neil Storage	Industrial	Partial	4,076	No
427-261-05	17942 Cowan Irvine, CA92614	N/A[1]	Commercial	Partial	2,177	No
427-261-06	17912 Cowan Irvine, CA 92614	N/A[1]	Industrial	Partial	2,763	No
427-261-07	17872 Cowan Irvine, CA 92614	N/A[1]	Industrial	Partial	3,010	No
427-261-08	17842 Cowan Irvine, CA 92614	N/A[1]	Industrial	Partial	3,000	No
427-261-09	17792 Cowan B Irvine, CA 92614	N/A[1]	Industrial	Partial	3,204	No
427-261-10	17792 Cowan A Irvine, CA 92614	N/A[1]	Industrial	Partial	4,503	No
427-262-06	17781 Cowan Irvine, CA 92614	ALG, Alzheimer's Association of Orange County, AnnexCore Marketing Agency, Caliber Collision Centers, Chrome Data, EnviroPacifica, Gradient Engineers, Home Buyer's Guide, Leighton, Terratest Labs, Vista Gardens Memory Care	Commercial	Partial	4,988	No
427-282-14	17952 Cowan Irvine, CA 92614	Assemblies of God	Commercial	Partial	1,141	No

Table 2.3.10 Full and Partial Acquisitions Anticipated Under Alternative 3

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
427-282-15	17952 Cowan Irvine, CA 92614	Assemblies of God	Commercial	Partial	3,684	No
430-011-03	2441 S. Pullman Street Santa Ana, CA 92705	N/A[1]	Industrial	Partial	3,086	No
430-011-04	2401 S. Pullman Street Santa Ana, CA 92705	N/A[1]	Industrial	Partial	622	No
430-012-04	2350 Pullman Street Santa Ana, CA 92705	Sweet Life Enterprises	Industrial	Partial	9,478	No
430-031-09	1717 E. Dyer Road Santa Ana, CA 92705	Motel 6	Commercial	Partial	4,155	No
430-032-10	2501 S. Pullman Street A Santa Ana, CA 92705	N/A[1]	Commercial	Partial	458	No
430-112-04	17132 Pullman Street Irvine, CA 92614	N/A[1]	Industrial	Partial	645	No
430-112-05	17132 Pullman Street Irvine, CA 92614	N/A[1]	Industrial	Partial	644	No
430-112-06	17092 Pullman Street Irvine, CA 92614	N/A[1]	Industrial	Partial	559	No
430-112-12	1063 McGaw Avenue Irvine, CA 92614	A-Mark Precious Metals, Collateral Finance Corporation, H.R. Harmer, Spectrum Group International, Spectrum Numismatics International, Spectrum Wine Auctions, Stack's Bowers, Teletrade	Commercial	Partial	1,071	No
430-115-01	1021 Duryea Avenue Irvine, CA 92614	Cabinets Plus	Industrial	Partial	3,072	No
430-171-07	1740 E. Garry Avenue Santa Ana, CA 92705	Advanced Plant Engineering Contractors, American Senior Living, Borazzi International, California MHP Management, Carson & Company, CHC Consulting, Cocojojo, Creative Integrated Systems, Creative Transportation, Diamond Roofing, Drink Pass, EFC Foundation, Elite Nursing Services, Energy Data Surveys Vinyl Windows, Gina Skin Care, Global Life Center, Gracorp, Hartley & Associates, HEC Services, Integrated Technology Systems, JTL Design Engineering, Kelsurveys, Inc., Lamaison Construction, Motion Analysis, OBM Global Technology, Powers Marketing Group, PMG/Zoom Western/SMD, Precision Payroll, Quality Professionals, Quick Processing – Bamma USA, Readwrite Solutions, Raybit Systems, RK Solutions, Rotary Lift, RVM Engineering, Safe Realty Property Management, Sandwich Express, Secret	Commercial	Partial	3,107	No

Table 2.3.10 Full and Partial Acquisitions Anticipated Under Alternative 3

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
		Garden, SEOP, Inc., Shoshin USA, SIG Technologies, South District Patrol, Southwest Express, SWC, Title XI				
430-241-07	1100 Valencia Avenue Tustin, CA 92780	RICOH	Industrial	Partial	31,185	No
430-241-12	1123 Warner Avenue Tustin, CA 92780	N/A[1]	Industrial	Partial	30,875	No
016-221-27	1580 E. Warner Avenue Santa Ana, CA 92705	N/A	Vacant	Full	76,760	No
016-221-28	Brookhollow Drive Santa Ana, CA 92705	N/A	Vacant	Full	37,426	No
016-221-29	S. Grand Avenue Santa Ana, CA 92705	N/A	Vacant	Full	9,055	No
403-072-01	S. Ritchey Street Santa Ana, CA 92705	Vacant	Industrial	Full	1,086	No
403-072-02	S. Ritchey Street Santa Ana, CA 92705	N/A	Public/ Exempt	Full	3,818	No
403-072-03	2201 S. Ritchey Street Santa Ana, CA 92705	Western Exterminator	Industrial	Full	35,611	Yes
411-141-06	Santa Ana, CA 92705	N/A	Vacant	Full	6,547	No
430-012-03	2400 S. Pullman Street Santa Ana, CA 92705	Above & Beyond, Inc.	Industrial	Full	35,953	Yes

Source: *Community Impact Assessment* (2015).
E. = East S. = South
N/A = Not Applicable sf = square feet

Alternative 3 would require the full acquisition of eight nonresidential parcels, including one city-owned parcel, in the City of Santa Ana. Although the city-owned parcel is exempt from property taxes, the acquisition of the other seven parcels to public ROW would result in property tax revenue losses for local taxing agencies. The full parcel acquisitions would result in the loss of an estimated $11,873 in annual property tax revenue to the City of Santa Ana, which is approximately 0.03 percent of the City of Santa Ana's total annual property tax revenue. The County, the Santa Ana and Tustin Unified School Districts, and other local taxing agencies that receive a share of the property tax from these parcels would also be affected. Partial acquisitions in the cities of Tustin, Santa Ana, and Irvine would result in additional minor reductions in the local property tax assessment roll, further decreasing property tax collections.

The property acquisitions associated with Alternative 3 would result in the displacement of three sales tax-generating businesses within the City of Santa Ana. As discussed above, there is an adequate supply of available replacement properties

in which to relocate the displaced businesses within the study area cities. In the event that all three displaced businesses are relocated within Santa Ana, there would be no net loss of sales tax revenue to that city. However, relocation to a different city would result in a net loss of sales tax revenue to the City of Santa Ana. As shown in Table 2.3.11, the potential annual sales tax revenue loss would be $12,192 for the City of Santa Ana if all three of the businesses are relocated outside of Santa Ana, and $4,064 for the County and $8,128 for the OCTA if they are relocated outside of Orange County. Should undergrounding of utilities be required, a permanent easement may be necessary.

Table 2.3.11 Potential Annual Sales Tax Revenue Losses Related to Business Displacements in the City of Santa Ana for Alternatives 3 and 4

Jurisdiction	Tax Rate	Taxable Sales	Total Sales Tax Revenue	Business Permits	Average Sales Tax/Business	Sales Tax Loss
City of Santa Ana	0.75%	$3,655,025,000	$27,412,688	$6,745	$4,064	$12,192
Orange County Transportation Fund	0.25%	—	$9,137,563	—	$1,355	$4,064
OCTA (Measure M)	0.50%	—	$18,275,125	—	$2,709	$8,128

Source: *Community Impact Assessment* (2015).
Note: This table represents the maximum sales tax loss that could occur if displaced businesses were relocated outside of Orange County.
OCTA = Orange County Transportation Authority

Alternative 4

As shown on Figure 2.3-4 and in Table 2.3.12, Alternative 4 would result in the full acquisition of the same eight parcels as Alternative 3. Six of those parcels are currently vacant and therefore would not result in business displacements. The other two full parcel acquisitions would result in the displacement of two businesses (Western Exterminator Company and Above & Beyond, Inc.). Alternative 4 would also result in the partial acquisition of 21 non-residential properties. Similar to the other Build Alternatives, Alternative 4 would result in the demolition of one occupied building, resulting in the displacement of one business. Alternative 4 would not require full acquisition of residential properties. Therefore, no residential displacements would occur.

Alternative 4 would result in the same employee displacements as Alternative 3. The 90 displaced employees represent approximately 0.06 percent of the total employed labor force in the City of Santa Ana. There are several available locations in which to relocate the displaced businesses within the study area cities; therefore, it is anticipated that businesses would be relocated near their current locations.

Table 2.3.12 Full and Partial Acquisitions Anticipated Under Alternative 4

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
016-221-12	Brookhollow Drive Santa Ana, CA 92705	N/A[1]	Commercial	Partial	6,813	No
016-221-13	Brookhollow Drive Santa Ana, CA 92705	N/A[1]	Commercial	Partial	3,818	No
016-221-14	1570 E. Warner Avenue Santa Ana, CA 92705	N/A[1]	Commercial	Partial	1,045	No
402-101-45	2101 E. Edinger Avenue Santa Ana, CA 92705	Freeway Honda	Commercial	Partial	1,480	No
402-111-24	1411 Village Way Santa Ana, CA 92705	Advanced Office Services, The Baseball Academy, Calumet Photographic, CubeKing, Enterprise Fleet Services, Liquid Handling, Monkeysports, Motorvac Technologies, Roger Dunn Golf Shop, Sender One Climbing, The Wine Club, Worldwide Golf Enterprises, Rockin' Jump	Commercial	Partial	32,769	Yes
403-041-04	1929 E. St. Andrew Place Santa Ana, CA 92705	N/A[1]	Industrial	Partial	3,258	No
403-041-07	1969 S. Ritchey Street Santa Ana, CA 92705	A-1 Shower Door, Andrade's, Applied Flow Technologies, Berry Sheet Metal, CPS Solutions, Fred's Custom Draperies, GD Designs, H&R Upholstery, J.E. Steel Rule Die, Junk Monster, Monarch Precision Deburring, Olama Products, Serena D'Italia, Speedway, Stedco Engineering, Sunny Hills Cleans, Water Jetting Equipment	Industrial	Partial	3,546	No
403-041-08	2061 S. Ritchey Street Santa Ana, CA 92705	O'Neil Storage	Industrial	Partial	4,076	No
430-011-03	2441 S. Pullman Street Santa Ana, CA 92705	N/A[1]	Industrial	Partial	3,086	No
430-011-04	2401 S. Pullman Street Santa Ana, CA 92705	N/A[1]	Industrial	Partial	622	No
430-012-04	2350 Pullman Street Santa Ana, CA 92705	Sweet Life Enterprises	Industrial	Partial	9,478	No
430-031-09	1717 E. Dyer Road Santa Ana, CA 92705	Motel 6	Commercial	Partial	4,155	No
430-032-10	2501 S. Pullman Street A Santa Ana, CA 92705	N/A[1]	Commercial	Partial	458	No
430-112-04	17132 Pullman Street Irvine, CA 92614	N/A[1]	Industrial	Partial	645	No
430-112-05	17132 Pullman Street Irvine, CA 92614	N/A[1]	Industrial	Partial	644	No
430-112-06	17092 Pullman Street Irvine, CA 92614	N/A[1]	Industrial	Partial	559	No
430-112-12	1063 McGaw Avenue Irvine, CA 92614	A-Mark Precious Metals, Collateral Finance Corporation, H.R. Harmer, Spectrum Group International, Spectrum Numismatics International, Spectrum Wine Auctions, Stack's Bowers, Teletrade	Commercial	Partial	1,071	No

Table 2.3.12 Full and Partial Acquisitions Anticipated Under Alternative 4

APN	Address	Business Name(s)	Existing Land Use	Acquisitions		
				Type	Area (sf)	Relocation
430-115-01	1021 Duryea Avenue Irvine, CA 92614	Cabinets Plus	Industrial	Partial	3,072	No
430-171-07	1740 E. Garry Avenue Santa Ana, CA 92705	Advanced Plant Engineering Contractors, American Senior Living, Borazzi International, California MHP Management, Carson & Company, CHC Consulting, Cocojojo, Creative Integrated Systems, Creative Transportation, Diamond Roofing, Drink Pass, EFC Foundation, Elite Nursing Services, Energy Data Surveys Vinyl Windows, Gina Skin Care, Global Life Center, Gracorp, Hartley & Associates, HEC Services, Integrated Technology Systems, JTL Design Engineering, Kelsurveys, Inc., Lamaison Construction, Motion Analysis, OBM Global Technology, Powers Marketing Group, PMG/Zoom Western/SMD, Precision Payroll, Quality Professionals, Quick Processing – Bamma USA, Readwrite Solutions, Raybit Systems, RK Solutions, Rotary Lift, RVM Engineering, Safe Realty Property Management, Sandwich Express, Secret Garden, SEOP, Inc., Shoshin USA, SIG Technologies, South District Patrol, Southwest Express, SWC, Title XI	Commercial	Partial	3,107	No
430-241-07	1100 Valencia Avenue Tustin, CA 92780	RICOH	Industrial	Partial	31,185	No
430-241-12	1123 Warner Avenue Tustin, CA 92780	N/A[1]	Industrial	Partial	30,875	No
016-221-27	1580 E. Warner Avenue Santa Ana, CA 92705	N/A	Vacant	Full	76,760	No
016-221-28	Brookhollow Drive Santa Ana, CA 92705	N/A	Vacant	Full	37,426	No
016-221-29	S. Grand Avenue Santa Ana, CA 92705	N/A	Vacant	Full	9,055	No
403-072-01	S. Ritchey Street Santa Ana, CA 92705	Vacant	Industrial	Full	1,086	No
403-072-02	S. Ritchey Street Santa Ana, CA 92705	N/A	Public/ Exempt	Full	3,818	No
403-072-03	2201 S. Ritchey Street Santa Ana, CA 92705	Western Exterminator	Industrial	Full	35,611	Yes
411-141-06	Santa Ana, CA 92705	N/A	Vacant	Full	6,547	No
430-012-03	2400 S. Pullman Street Santa Ana, CA 92705	Above & Beyond, Inc.	Industrial	Full	35,953	Yes

Source: *Community Impact Assessment* (2015).
[1] Partial acquisition would require the demolition of a vacant building.
E. = East S. = South
N/A = Not Applicable sf = square feet

Alternative 4 would result in the same property tax and sales tax losses as Alternative 3, as shown in Table 2.3.11. Should undergrounding of utilities be required, a permanent easement may be necessary.

No Build Alternative

No improvements to SR-55 other than routine maintenance are proposed under the No Build Alternative. The No Build Alternative would not result in property acquisitions; therefore, the No Build Alternative would not result in property or sales tax revenue losses.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

After construction, all TCEs would be restored to their original pre-project or better conditions.

The following measure would be implemented to minimize permanent impacts related to relocations and displacements under Build Alternatives 1, 2, 3, and 4:

REL-1 Property acquisition will be conducted in compliance with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) (Public Law 91-646, 84 Statutes 1894). The Uniform Act mandates that certain relocation services and payments be made available to eligible residents, businesses, and nonprofit organizations displaced by federal or federally assisted projects. The Uniform Act provides for uniform and equitable treatment by federal or federally assisted programs of persons displaced from their homes, businesses, or farms and establishes uniform and equitable land acquisition policies.

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 William J. Clinton on February 11, 1994. EO 12898 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 2014, this was $23,850 for a family of four.

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

2.3.3.2 Affected Environment

The information in this section is summarized from the *Community Impact Assessment* (2015). The environmental justice study area includes parts of the cities of Tustin, Santa Ana, and Irvine, including the 11 census tracts shown previously on Figure 2.3-1 (i.e., Census Tracts 525.02, 740.03, 740.04, 744.03, 744.08, 755.05, 755.07, 755.12, 755.13, 755.14, and 755.15).

The term "minority" is defined as persons who identify themselves as Black/African-American, Asian, Native Hawaiian/Pacific Islander, Native American/Native Alaskan, or of Hispanic/Latino origin. "Low-income" is defined based on the Department of Health and Human Services (DHHS) poverty guidelines.

The median household income and percentages of the population in the study area census tracts, the County, and the cities of Tustin, Santa Ana, and Irvine that consist of racial minorities, Hispanics/Latinos, low-income residents, and transit-dependent residents are summarized in Table 2.3.13.

As shown in Table 2.3.13, the median household income in the County is $75,422. The median household income in the City of Irvine ($90,585) is higher than the County, while the median household incomes in the cities of Santa Ana and Tustin ($53,335 and $73,194, respectively) are lower than in the County. The study area census tracts also exhibit a wide range in median household incomes. Census Tract 525.02 has the highest median household income at $94,567, while the median household incomes in Census Tracts 744.03, 744.08, and 755.14 are below $45,000.

The racial minority population percentages in the study area census tracts, the County, and the cities of Tustin, Santa Ana, and Irvine were calculated by determining the number of Black/African-American, Asian, American Indian/Native Alaskan, and Hawaiian/Pacific Islander residents (one race only, as identified by the 2010 Census). As shown in Table 2.3.13, racial minorities comprise approximately 39 percent of the population in the County. Racial minorities comprise a higher percentage of the populations in the study area cities, ranging from approximately 47 percent of the population in Tustin to approximately 54 percent of the population in Santa Ana. Overall, racial minorities comprise a higher percentage of the

Table 2.3.13 Racial Minority, Hispanic/Latino, Low-Income, and Transit-Dependent Populations

Area	Racial Minorities[1]	Hispanic/ Latino Residents[1]	Below Poverty Level[2]	Transit-Dependent Residents[3]	Median Household Income[2]
County					
Orange County	1,179,474 (39.2%)	1,012,973 (33.7%)	12.4%	18.1%	$75,422
Study Area Cities					
City of Tustin	35,811 (47.4%)	30,024 (39.7%)	12.2%	21.0%	$73,194
City of Santa Ana	175,690 (54.1%)	253,928 (78.2%)	21.5%	37.0%	$53,335
City of Irvine	105,160 (48.5%)	19,621 (9.2%)	12.2%	13.9%	$90,585
Study Area Census Tracts					
Census Tract 525.02 (City of Tustin)	2,067 (34.9%)	1,424 (24.1%)	4.7%	17.9%	$94,567
Census Tract 740.03 (City of Santa Ana)	1,671 (53.3%)	2,388 (76.1%)	18.2%	32.2%	$73,578
Census Tract 740.04 (City of Santa Ana)	3,721 (50.0%)	4,364 (58.6%)	6.7%	24.8%	$64,602
Census Tract 744.03 (City of Santa Ana)	2,892 (50.8%)	5,382 (94.6%)	29.4%	49.6%	$34,861
Census Tract 744.08 (City of Tustin)	3,188 (59.0%)	4,212 (78.0%)	18.9%	35.0%	$43,239
Census Tract 755.05 (City of Tustin)	1,344 (37.4%)	1,478 (41.1%)	9.7%	16.8%	$63,954
Census Tract 755.07 (City of Tustin)	2,460 (47.4%)	2,582 (49.8%)	15.2%	26.4%	$55,372
Census Tract 755.12 (City of Tustin)	1,924 (54.3%)	2,036 (57.4%)	5.4%	28.8%	$53,750
Census Tract 755.13 (City of Tustin)	2,687 (53.0%)	2,737 (53.9%)	11.4%	38.8%	$61,250
Census Tract 755.14 (City of Tustin)	2,150 (58.1%)	2,455 (66.3%)	26.4%	38.3%	$42,554
Census Tract 755.15 (Cities of Tustin, Santa Ana, and Irvine)	8,990 (58.8%)	5,803 (37.9%)	11.3%	21.1%	$76,591

Source: *Community Impact Assessment* (2015).

[1] From the 2010 Census. The Hispanic/Latino population is not considered a race but rather an ethnicity; therefore, the Hispanic/Latino category may include more than one race.

[2] From the 2009–2013 American Community Survey.

[3] Calculated by determining the number of persons in households who are eligible to drive but do not have access to a vehicle, based on 2009–2013 ACS data.

population in eight of the study area census tracts compared to the County. Census Tracts 744.08 (59.0 percent), 755.14 (58.1 percent), and 755.15 (58.8 percent) have the highest percentage of racial minorities of the census tracts in the study area.

As shown in Table 2.3.13, Hispanics/Latinos represent approximately 34 percent of the County population. In the cities of Irvine, Tustin, and Santa Ana, Hispanics/ Latinos comprise 9 percent, 40 percent, and 78 percent of the populations, respectively. Ten of the study area census tracts exhibit higher Hispanic/Latino populations than the County overall. Substantial Hispanic/Latino population

concentrations exist in Census Tracts 740.03 (76 percent), 744.03 (95 percent), and 744.08 (78 percent).

As shown in Table 2.3.13, the percentage of persons living below the poverty level was substantially higher in the City of Santa Ana (21.5 percent) than in the County (12.4 percent), while the percentages of persons living below the poverty level in the City of Tustin (12.2 percent) and the City of Irvine (12.2 percent) were similar to that of the County. Five census tracts exhibited a higher percentage of persons living below the poverty level than did the County. The percentages of persons living below the poverty level in two census tracts (i.e., Census Tracts 744.03 and 755.14) were substantially higher than the County at approximately 29.4 percent and 26.4 percent, respectively.

The transit-dependent population was calculated by determining the number of persons in households who are eligible to drive but do not have access to a vehicle. As shown in Table 2.3.13, the percentage of transit-dependent residents in the City of Tustin (21.0 percent) is similar to that in the County (18.1 percent), while the percentage of transit-dependent residents in the City of Irvine (13.9 percent) is lower than that in the County. The City of Santa Ana (37.0 percent) has a much higher percentage of transit-dependent residents than the County. Of the 11 census tracts in the study area, 9 exhibit higher percentages of transit-dependent residents than the County. Census Tract 744.03 (49.6 percent) has the highest percentage of transit-dependent residents, and Census Tract 755.05 (16.8 percent) has the lowest.

In summary, several census tracts in the study area exhibit several environmental justice indicators that may contain low-income populations, people living below the poverty level, transit-dependent residents, and minority populations. In particular, Census Tract 744.03 has the lowest median household income, the highest percentage of racial minorities, the highest percentage of persons living below the poverty level, and the highest percentage transit-dependent population.

2.3.3.3 Environmental Consequences

Temporary Impacts

Build Alternatives

Construction activities associated with Build Alternatives 1, 2, 3, and 4 would temporarily affect residents and businesses throughout the entire project area, including low-income and minority populations. Those impacts would include temporary disruptions of local traffic patterns and access to residences and businesses

during overnight mainline, ramp, and local arterial closures as well as increased traffic congestion, noise levels, and dust. However, environmental justice populations would not be disproportionately impacted.

The project construction activities would also provide jobs that would benefit local economies, including low-income and minority populations.

As described in further detail in Section 2.12, Hazardous Waste/Materials, seven of the parcels that would be fully or partially acquired under the Build Alternatives were identified as having hazardous waste concerns. As shown in Table 2.3.14 below, of these seven parcels, all are located in census tracts where low-income and minority populations are known to be present.

Table 2.3.14 Properties Proposed for Full and Partial Acquisitions with Hazardous Waste Concerns

APN	Census Tract Location	Environmental Justice Population Present?
402-111-24	744.03	Yes
403-041-07	744.03	Yes
403-072-01	744.03	Yes
403-072-02	744.03	Yes
427-261-08	755.15	Yes
430-012-03	755.15	Yes
430-241-12	755.15	Yes

Sources: *Initial Site Assessment* (2013) and *Community Impact Assessment* (2015).

Although all of the parcels shown in Table 2.3.14 are located near environmental justice populations, implementation of Measures HAZ-1, HAZ-4, HAZ-5, and HAZ-6, which are described in further detail in Section 2.12.4, Avoidance, Minimization, and/or Mitigation Measures, would address any risks associated with the following hazards identified on these parcels: contaminated soil and groundwater; asbestos-containing materials (ACMs), lead-based paint (LBP), mercury, and/or chlorofluorocarbons; residual contamination from a dispenser piping leak; hazardous chemicals associated with automotive-related businesses; and residual pesticides and herbicides in subsurface soils due to historic agricultural uses.

Because the identified hazardous materials risks would be located far from residential populations and the implementation of the avoidance and minimization measures identified above would avoid and/or minimize potential effects related to hazardous materials and hazardous wastes during construction of the Build Alternatives, environmental justice populations would not be disproportionately impacted.

No Build Alternative

Under the No Build Alternative, the temporary construction-related adverse effects on all populations, including low-income and minority (environmental justice) populations, during construction of the Build Alternatives would not occur. However, these environmental justice populations also would not gain any economic benefit from the construction of Build Alternatives 1, 2, 3, and 4.

Permanent Impacts

Alternatives 1, 2, 3, and 4 (Build Alternatives)

None of the Build Alternatives would require the acquisition of residential properties or the displacement of residents. Therefore, Build Alternatives 1, 2, 3, and 4 would not result in adverse effects on minority and low-income populations related to the acquisition of residential uses and/or the displacement of residents.

Alternatives 1 and 2 would displace one business, while Alternatives 3 and 4 would displace three businesses. Despite the fact that each of the businesses that would be displaced by the Build Alternatives is located in a census tract where low-income and minority populations reside, as described above in Section 2.3.1.3, Environmental Consequences, all three of the businesses that could be displaced provide specialized services that are likely to be marketed to the broader region rather than simply the adjacent communities, and one of the businesses is a relatively new business to the area. Therefore, their relocation is not anticipated to result in any damage or disruption to the social fabric of the communities in which they are located.

In Orange County, businesses typically hire employees from throughout the broader region, especially for higher-paying positions. Therefore, it can be difficult to determine whether a business employs a large percentage of low-income or minority populations using Census data, which is derived from responses provided by nearby residents. Because none of the businesses appear to exhibit any unique characteristics that suggest their employment base is primarily drawn from the census tract in which they are located, their relocation is not likely to disproportionately affect minority or low-income populations.

Although each of the Build Alternatives would result in permanent noise level increases along the SR-55 corridor within the project area, most of the noise level increases at the residential receptors would be barely perceptible (the human ear cannot perceive noise level increases of less than 3 decibels [dB]). Therefore, because

the noise level increases under the Build Alternatives would be minimal, low-income and minority populations would not be adversely affected.

The Build Alternatives would benefit all study area residents, including low-income and minority populations, by improving mobility and circulation throughout the study area and the central Orange County. Therefore, Build Alternatives 1, 2, 3, and 4 would improve traffic patterns and mobility for all residents, including low-income and minority persons. Transit-dependent populations would also benefit from improved travel speeds for bus routes operating on SR-55 during peak hours.

Based on the above discussion and analysis, Build Alternatives 1, 2, 3, and 4 will not cause disproportionately high and adverse effects on any minority or low-income populations per EO 12898 regarding environmental justice.

No Build Alternative

No improvements to SR-55 other than routine maintenance are proposed under the No Build Alternative. Therefore, the No Build Alternative would not result in property acquisition or permanent increases in noise levels that would impact populations in the area, including low-income and minority populations. However, the No Build Alternative would also not provide transportation benefits to populations in the area, including low-income and minority populations that would occur under the Build Alternatives.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Although the Build Alternatives would not result in disproportionate impacts on environmental justice populations during construction, measures included in the Build Alternatives would reduce temporary construction traffic, noise, and air quality impacts on all populations in the study area, including environmental justice populations.

Temporary construction impacts on environmental justice populations would be minimized by implementation of Measure T-1, which is provided in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities. Measure T-1 requires development and implementation of a TMP during construction of the Build Alternatives to: address traffic delays; maintain traffic flow in the SR-55 corridor; manage detours and temporary road, lane, and ramp closures; provide ongoing information to the public regarding construction activities, closures, and detours; and maintain a safe environment for construction workers and travelers.

Temporary air quality impacts would be minimized by implementation of Measures AQ-1 through AQ-5, which are detailed in Section 2.13, Air Quality. These measures require the control of dust and equipment emissions during construction of the Build Alternatives. These measures would benefit all persons in the project area, including environmental justice populations.

Temporary noise impacts would be minimized by implementation of Measure N-1, which is detailed in Section 2.14, Noise. Measure N-1 requires the construction contractor to comply with Caltrans Standard Specifications, Section 14-8.02, "Noise Control," during construction of the Build Alternatives. These measures would benefit all persons in the project area, including environmental justice populations.

The Build Alternatives would not result in permanent adverse effects on environmental justice populations; therefore, no avoidance, minimization, and/or mitigation measures are required.

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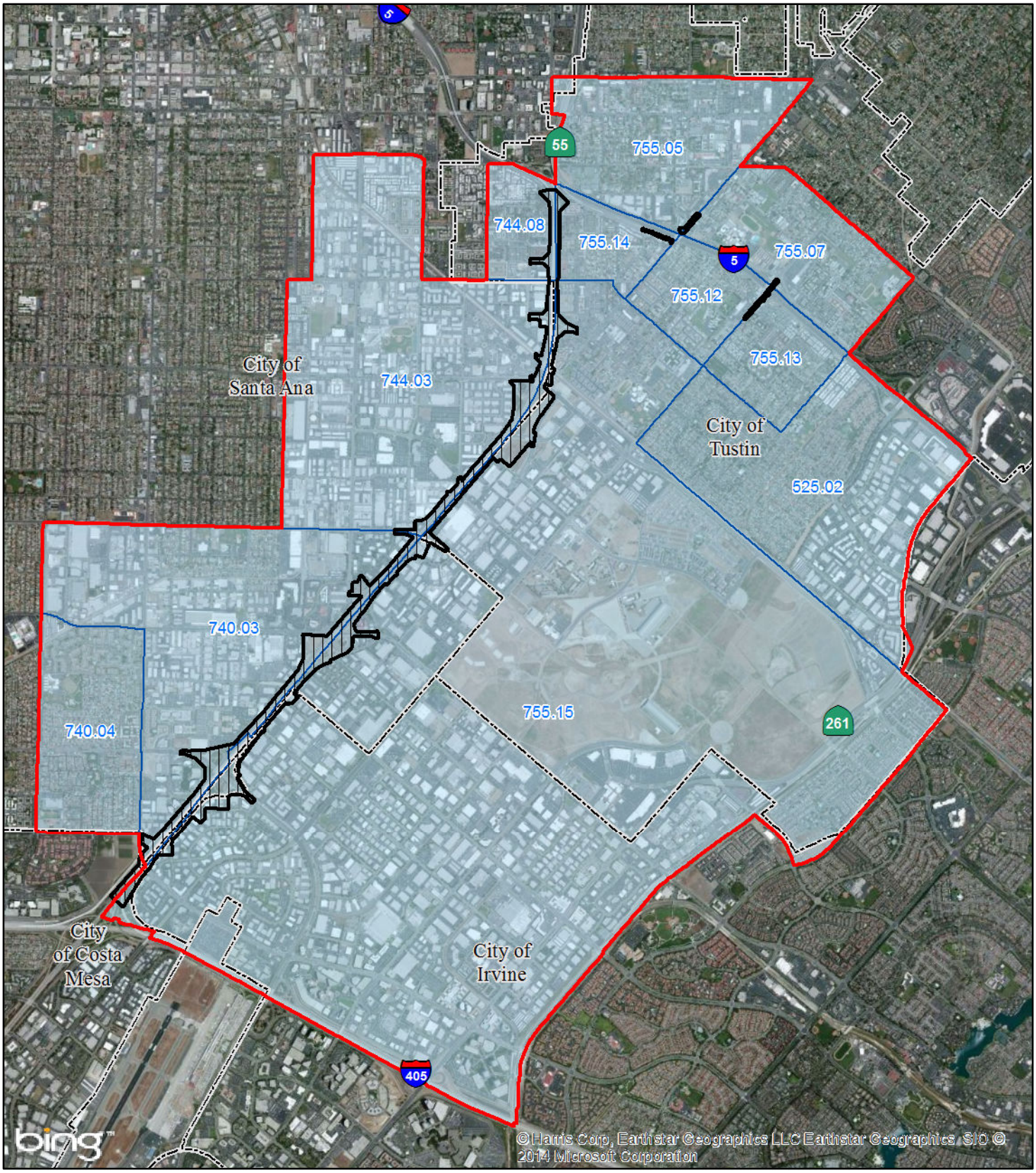

LEGEND

- Project Area
- City Boundary
- 2010 Census Tract Boundaries
- Study Area

N

0 1750 3500
FEET

SOURCE: Bing Maps (c. 2010); Census Bureau (2010)

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FIGURE 2.3-1

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Project and Study Area Boundaries and Census Tracts

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Costa Mesa
Santa Ana
Irvine
Unincorporated
55
SUNFLOWER AVE
MAIN ST
S MAIN ST
E SANDPOINTE AVE
MACARTHUR PL
MCDURMOTT W
COWAN
FITCH
MITCHELL
E MACARTHUR BLVD

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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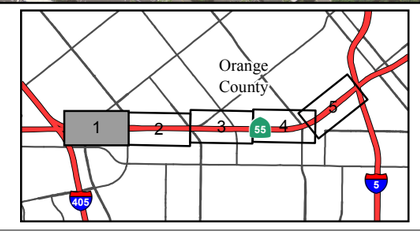

FIGURE 2.3-2
Sheet 1 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 1 ROW/TCE Impacts

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EA 0J3400

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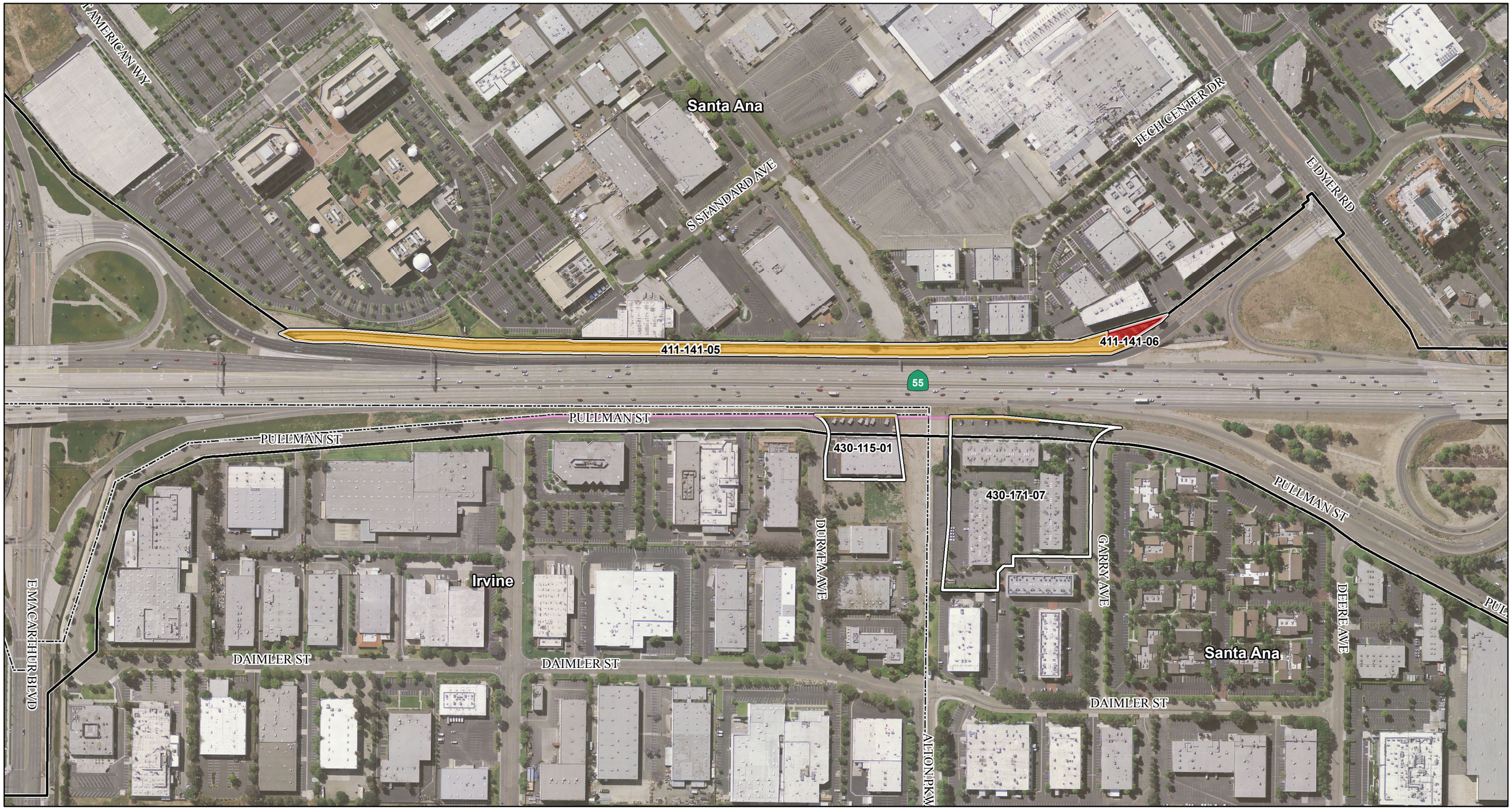

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

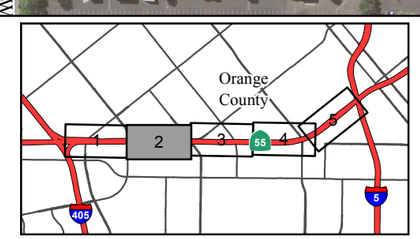

FIGURE 2.3-2
Sheet 2 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 1 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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Santa Ana
S HOTEL TERRACE DR
S GRAND AVE
016-221-29
016-221-28
016-221-27
BROOKHOLLOW DR
BROOKHOLLOW DR
E NEWPORT CIR
S RITCHEY ST
55
S PULLMAN ST
E DYER RD
430-031-03
430-031-09
PULLMAN ST
Santa Ana
E CARNEGIE AVE
430-012-04
430-012-03
S PULLMAN ST
E WARNER AVE
430-241-12
Tustin

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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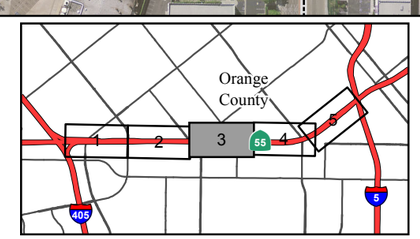

FIGURE 2.3-2
Sheet 3 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 1 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Santa Ana
E ST ANDREW PL
403-041-07
403-041-04
E OCCIDENTAL ST
BOYD ST
E POMONA ST
E AUTO MALL DR
402-101-39
402-101-07
402-101-45
HOSSIN RAIL CORRIDOR
SANTA ANA/SANTA FE CHANNEL
402-111-24
402-142
402-142-24
NEWPORT AV
430-241-07
BEEL AVE
VALENCIA AVE
NEWPORT AVE
Tustin
DEL AMO AVE

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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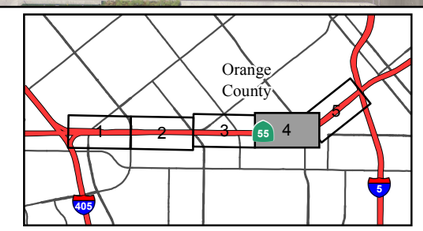

FIGURE 2.3-2
Sheet 4 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 1 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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E AUTO MALL DR
LOSSAN/RAIL CORRIDOR
SANTA ANA/SANTA FE CHANNEL
402-101-07
402-101-39
Santa Ana
E WILSHIRE AVE
VILLAGE WY
402-111-24
402-111-41
E MCFADDEN AVE
402-251-07
TUSTIN VILLAGE WY
E BALBOA LN
55
402-142-10
402-142-11
402-142-12
402-142-13
402-142-24
NEWPORT AVE
KENNTON DR
ALTADENA DR
PASADENA AVE
WHITBY CIR
CARLANN CIR
Tustin
MYRTLE AVE
5

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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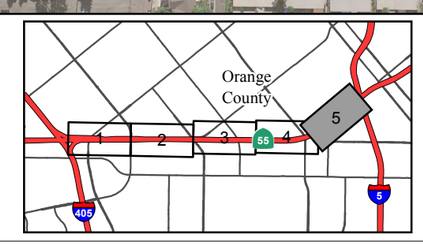

FIGURE 2.3-2
Sheet 5 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 1 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Costa Mesa

Santa Ana

Unincorporated

Irvine

SUNFLOWER AVE

MAIN ST

S MAIN ST

E SANDPOINTE AVE

MACARTHUR PL

55

427-282-14

427-282-15

427-261-05

427-261-06

427-261-07

427-261-08

427-261-09

427-261-10

427-262-06

427-262-02

COWAN

MCDURMOTT W

HITCH

MITCHELL

E MACARTHUR BLVD

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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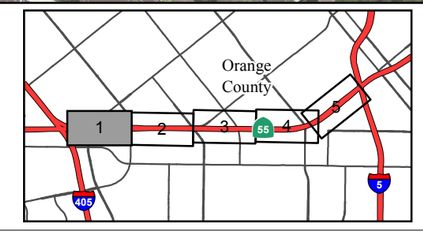

FIGURE 2.3-3
Sheet 1 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 2 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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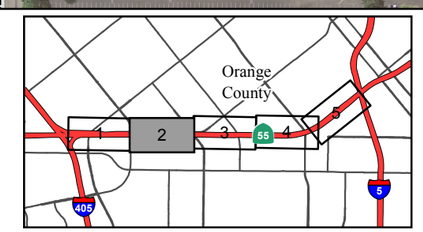

FIGURE 2.3-3
Sheet 2 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 2 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Santa Ana
S HOTEL TERRACE DR
S GRAND AVE
016-221-29
016-221-28
016-221-27
BROOKHOLLOW DR
016-221-13
016-221-12
BROOKHOLLOW DR
403-072-03
403-072-02
403-072-01
S RITCHEY ST
E NEWPORT CIR
55
S PULLMAN ST
E DYER RD
430-031-03
430-031-09
PULLMAN ST
Santa Ana
E CARNEGIE AVE
430-012-04
430-012-03
S PULLMAN ST
E WARNER AVE
430-241-12
Tustin

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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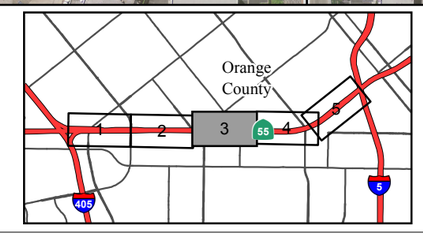

FIGURE 2.3-3
Sheet 3 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 2 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Santa Ana
Tustin
EAST ANDREWS
RITCHEY ST
ST ANDREWS
FOCCIDENTAL ST
BOND ST
EROMONA ST
EAUTO MALL DR
LOSSIN RAIL CORRIDOR
SANTA ANA/SANTA FE CHANNEL
NEWPORT AVE
ELDINGER AVE
DEL AMO AVE
VALENCIA AVE
BELL AVE
55
402-111-24
402-101-39
402-101-07
402-101-45
402-142
402-142-24
430-252-02
430-252-10
430-251-15
430-251-14
430-251-35
403-041-07
403-041-08
403-041-04
430-241-07

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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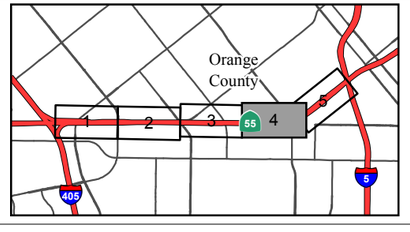

FIGURE 2.3-3
Sheet 4 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 2 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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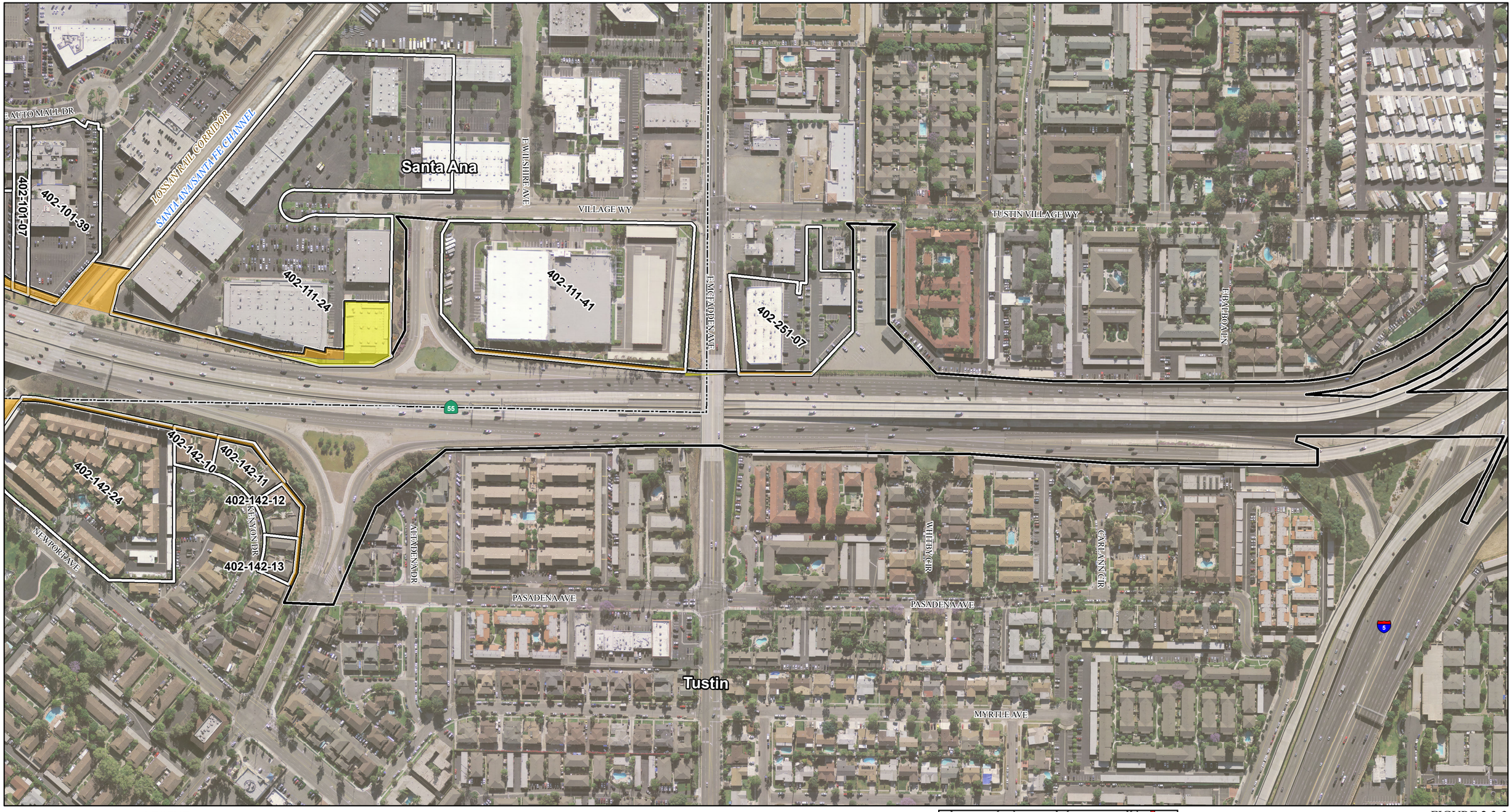

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

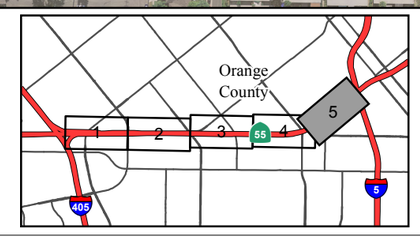

FIGURE 2.3-3
Sheet 5 of 5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 2 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (09/09/2014)

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Costa Mesa

Santa Ana

Unincorporated

Irvine

SUNFLOWER AVE

MAIN ST

S MAIN ST

E SANDPOINTE AVE

MACARTHUR PL

E MACARTHUR BLVD

COWAN

MCDURMOTT W

HITCH

MITCHELL

427-282-15

427-282-14

427-261-05

427-261-06

427-261-07

427-261-08

427-261-09

427-261-10

427-262-06

427-262-02

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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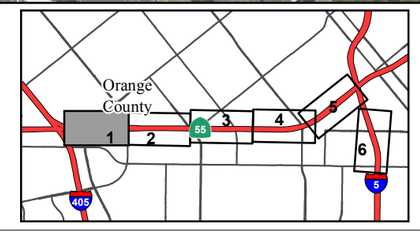

FIGURE 2.3-4
Sheet 1 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 3 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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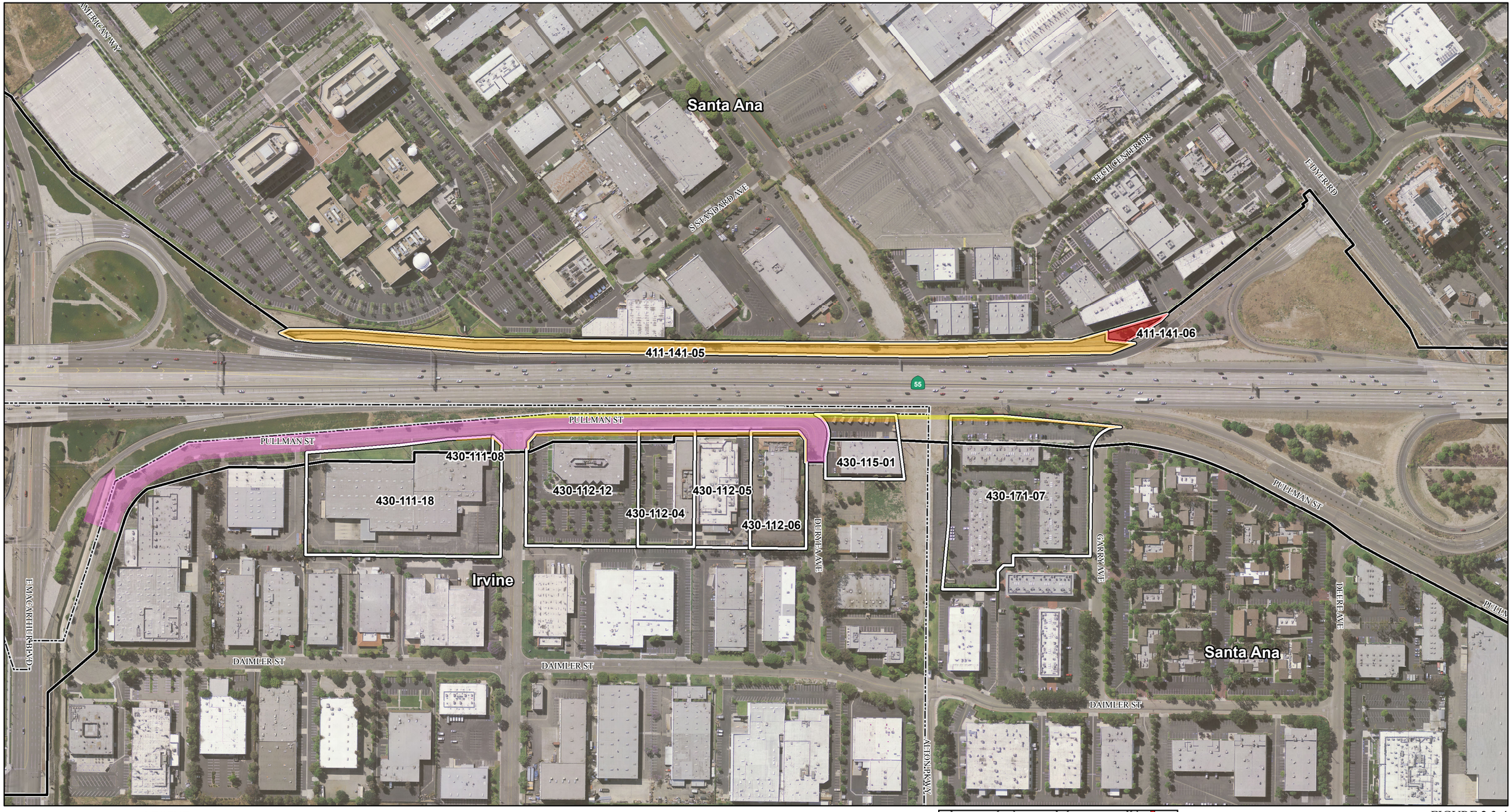

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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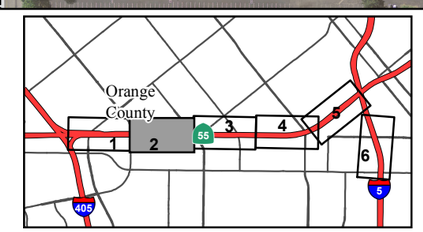

FIGURE 2.3-4
Sheet 2 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 3 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Santa Ana
S HOTEL TERRACE DR
S GRAND AVE
016-211-28
016-211-29
016-211-27
016-221-14
016-221-13
BROOKHOLLOW DR
016-221-12
BROOKHOLLOW DR
403-071-16
403-071-19
403-071-17
403-071-18
403-071-13
E NEWPORT CIR
403-072-03
403-072-02
403-072-01
S RITCHEY ST
55
F DYER RD
S PULLMAN ST
430-031-03
430-031-09
PULLMAN ST
430-032-10
Santa Ana
E CARNEGIE AVE
430-011-03
430-011-04
430-012-04
430-012-03
S PULLMAN ST
E WARNER AVE
430-241-12
Tustin

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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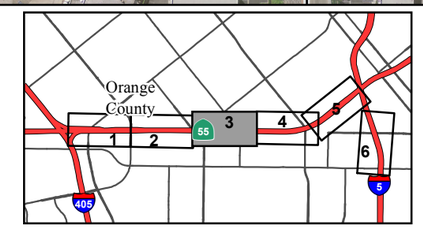

FIGURE 2.3-4
Sheet 3 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 3 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Santa Ana
Tustin
EST ANDREW PL
RITCHEY ST
ST ANDREW PL
FOCCIDENTAL ST
BONITA ST
BOND ST
E AUTOMALL DR
LOSSIN RAIL CORRIDOR
SANTA ANA/SANTA FE CHANNEL
NEWPORT AVE
ELDINGER AVE
BELL AVE
VALENCIA AVE
DEL AMO AVE
55
402-111-24
402-101-39
402-101-07
402-101-45
402-142
402-142-24
430-252-02
430-252-10
430-251-15
430-251-14
430-251-35
430-251-22
430-241-07
403-041-07
403-041-08
403-041-04

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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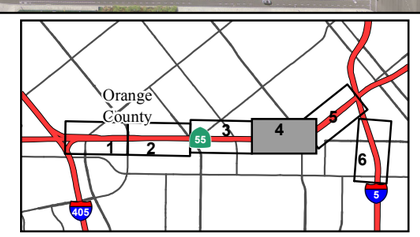

FIGURE 2.3-4
Sheet 4 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 3 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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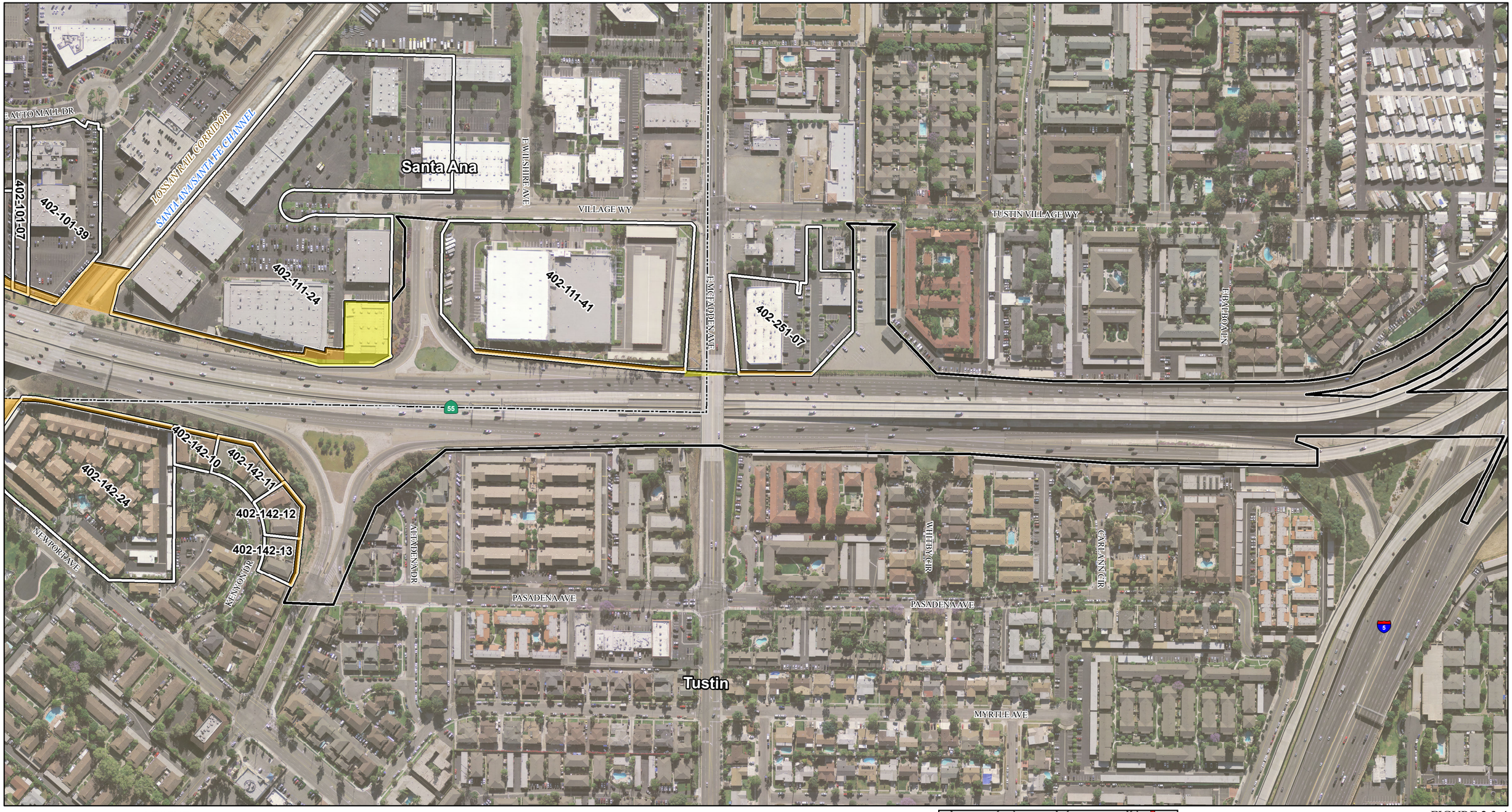

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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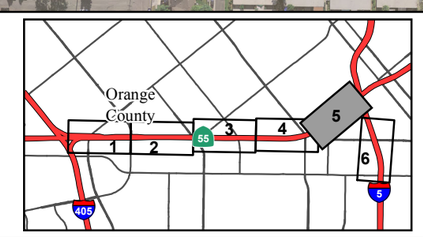

FIGURE 2.3-4
Sheet 5 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 3 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Tustin

EL CAMINO REAL

C HI ST

NEWPORT AVE

MITCHELL AVE

RED HILL AVE

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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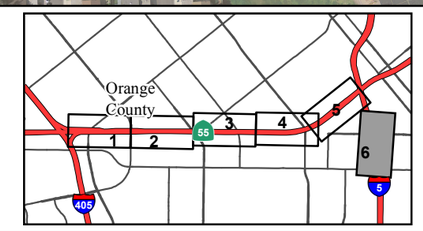

FIGURE 2.3-4
Sheet 6 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 3 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Costa Mesa

Santa Ana

Unincorporated

Irvine

SUNFLOWER AVE

MAIN ST

S MAIN ST

E SANDPOINTE AVE

MACARTHUR PL

55

MCDURMOTT W

COWAN

HITCH

MITCHELL

E MACARTHUR BLVD

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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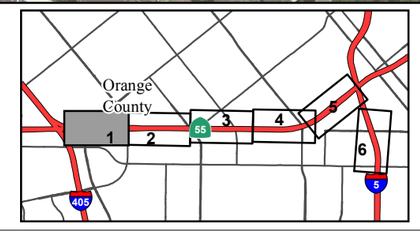

FIGURE 2.3-5
Sheet 1 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 4 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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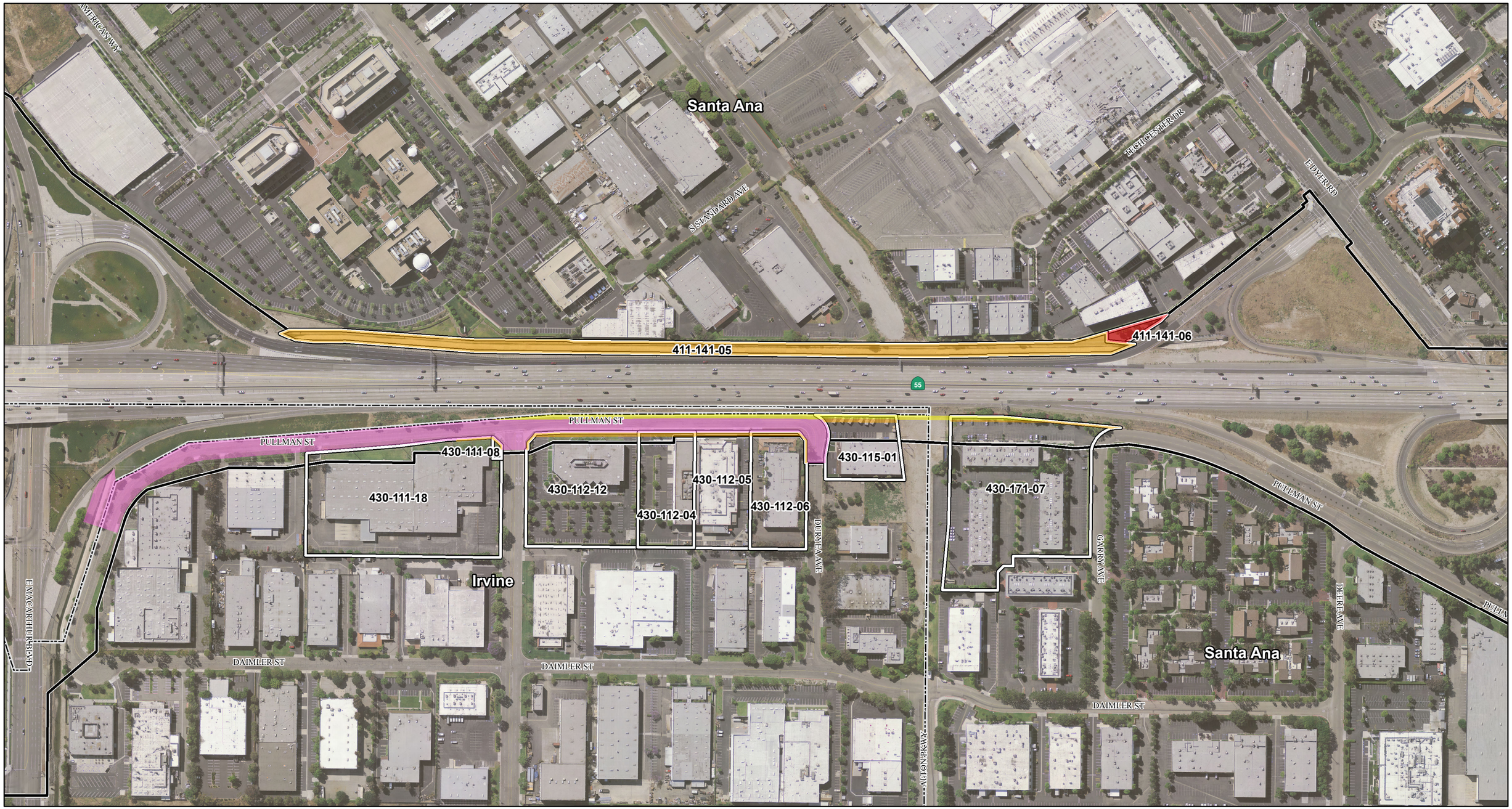

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

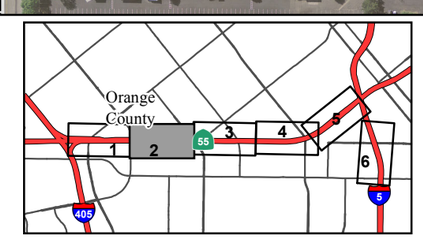

FIGURE 2.3-5
Sheet 2 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 4 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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Santa Ana
S HOTEL TERRACE DR
S GRAND AVE
016-221-28
016-221-29
016-221-27
016-221-14
BROOKHOLLOW DR
016-221-13
016-221-12
BROOKHOLLOW DR
403-071-16
403-071-17
403-071-19
403-071-18
403-071-13
E NEWPORT CIR
403-072-03
403-072-02
403-072-01
S RITCHEY ST
55
S PULLMAN ST
E DYER RD
430-031-03
430-031-09
430-011-03
430-011-04
430-012-04
430-012-03
430-032-10
Santa Ana
E CARNEGIE AVE
S PULLMAN ST
E WARNER AVE
430-241-12
Tustin
PULLMAN ST

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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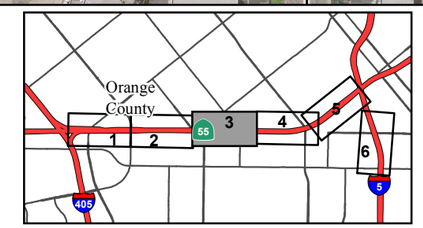

FIGURE 2.3-5
Sheet 3 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 4 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

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Santa Ana
Tustin
EST ANDREW PL
RITCHEY ST
ST ANDREW PL
E OCCIDENTAL ST
E ROMONA ST
BOND ST
E AUTO MALL DR
LOSSAN RAIL CORRIDOR
SANTA ANA/SANTA FE CHANNEL
NEWPORT AVE
ELDINGER AVE
VALENCIA AVE
BELL AVE
DEL AMO AVE
55
402-111-24
402-101-39
402-101-07
402-101-45
402-142-
402-142-24
430-252-02
430-252-10
430-251-15
430-251-14
430-251-35
430-251-22
430-241-07
403-041-07
403-041-08
403-041-04

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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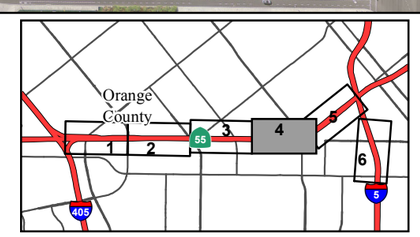

FIGURE 2.3-5
Sheet 4 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 4 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
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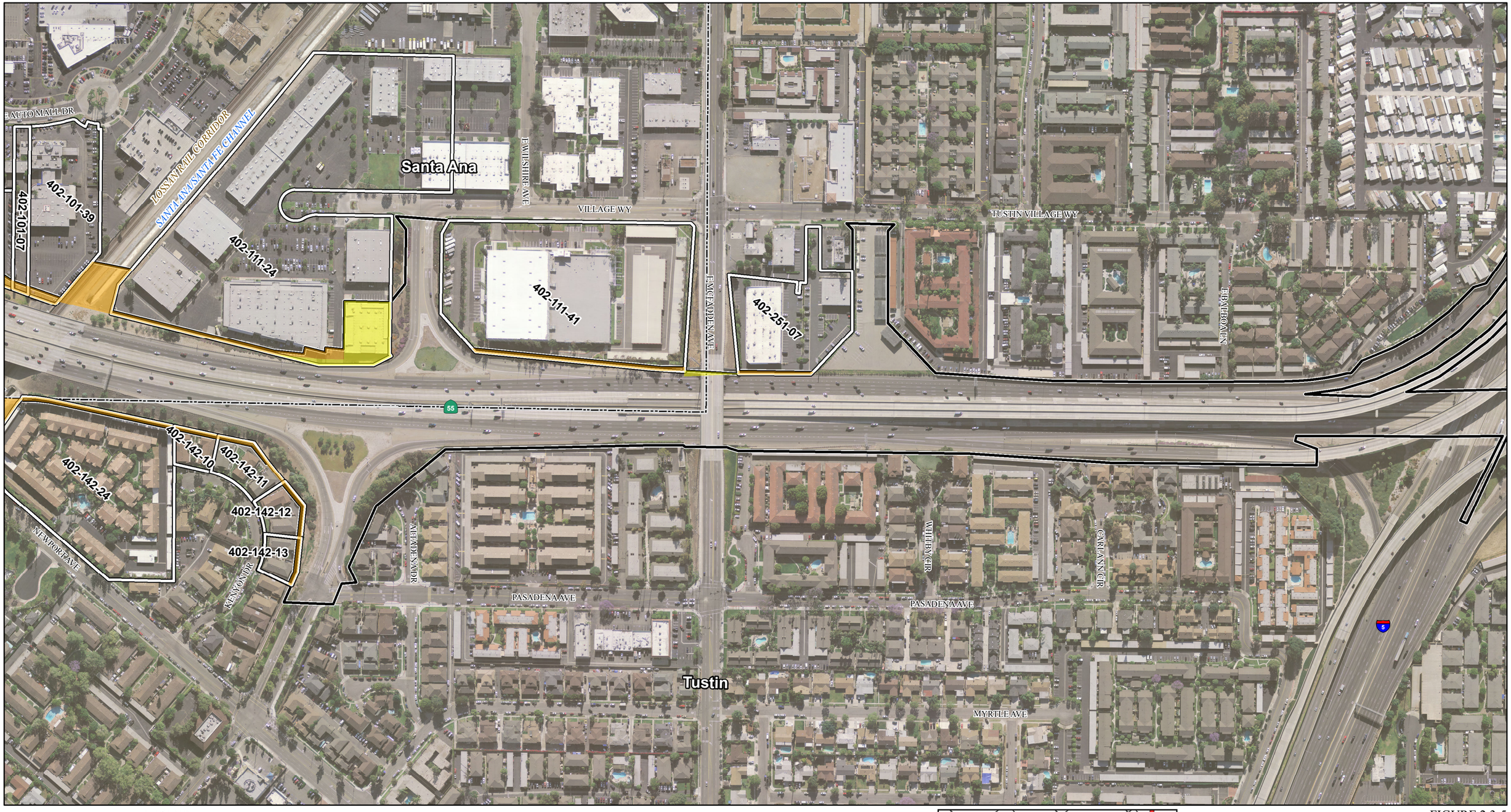

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

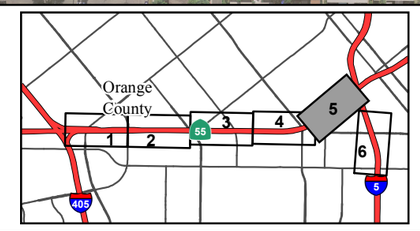

FIGURE 2.3-5
Sheet 5 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 4 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
EA 0J3400

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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Tustin

EL CAMINO REAL

NISSON RD

6TH ST

NEWPORT AVE

MITCHELL AVE

RED HILL AVE

LEGEND

- Project Area
- City Boundary
- Affected Parcel Boundary
- Encroachment Area
- Temporary Construction Easement
- Potential Full Right of Way Acquisition
- Potential Partial Right of Way Acquisition

0 150 300
FEET

SOURCE: Eagle Aerial (4/2011); TBM (2008); HDR (02/05/2014)

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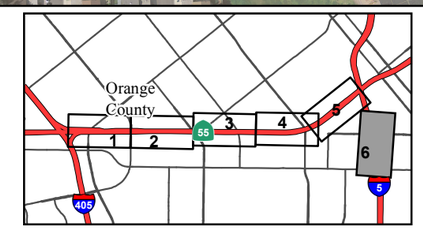

FIGURE 2.3-5
Sheet 6 of 6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Alternative 4 ROW/TCE Impacts

12-ORA-55 PM 6.4/10.3
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2.4 Utilities and Emergency Services

This section is based on information from the *Community Impact Assessment* (CIA, 2015).

2.4.1 Affected Environment

This section describes the existing utilities and emergency services facilities and providers in the project area (the maximum disturbance limits for the Build Alternatives) and a study area extending 0.5 mile (mi) from the limits of the project area.

2.4.1.1 Utilities

The following utility providers have facilities located within the study area along the project segment of State Route 55 (SR-55):

- **Southern California Edison:** Overhead and underground transmission lines, transformers, and power poles
- **Southern California Gas Company:** Underground distribution pipelines and 30-inch-diameter, high-pressure pipelines
- **AT&T:** Telecommunication cables and a cell tower
- **Time Warner:** Telecommunication cables
- **City of Santa Ana:** Water service lines, fire service lines, and sewer lines
- **Orange County Sanitation District:** Sewer lines
- **Irvine Ranch Water District:** Water service lines, fire service lines, and sewer lines
- **Mobil Oil:** 36-inch-diameter gas line

2.4.1.2 Fire Protection

Fire protection and emergency medical/paramedic services in the Cities of Santa Ana, Tustin, and Irvine in the study area are provided by the Orange County Fire Authority under contract to those cities. There are two Orange County Fire Authority fire stations located within 0.5 mi of the Study Area: Stations #37 (14901 Red Hill Avenue, Tustin) and #79 (1320 Warner Avenue, Santa Ana). The nearest Orange County Fire Authority station in Irvine (i.e., Station #28) is approximately 1.0 mi east of the study area.

The Costa Mesa Fire Department provides fire protection services in the City of Costa Mesa. There is one Costa Mesa Fire Department station (the Metro Fire Station at 3350 Sakioka Drive) located within 0.5 mi of the study area.

2.4.1.3 Police Protection

Police protection services in the study area are provided by the police departments in the Cities of Tustin, Santa Ana, and Irvine. There is one police station located within 0.5 mi of the study area: Tustin Police Department (300 Centennial Way, Tustin). The other nearest police stations are 1.9 mi northwest of the study area in Santa Ana and 2.1 mi east of the study area in Irvine.

Police services on freeways in California, including SR-55, are provided by the California Highway Patrol. The nearest California Highway Patrol office is approximately 1.8 mi north of the study area in the City of Santa Ana.

2.4.2 Environmental Consequences

2.4.2.1 Temporary Impacts

Build Alternatives

The construction of the Build Alternatives could affect existing underground and overhead utility facilities, which could require protection in-place, removal, replacement, or relocation. The utility facilities that could potentially be affected during construction of the Build Alternatives are listed in Table 2.4.1. An updated utility search would be conducted during final design to determine all utility conflicts that would require protection in-place or relocation. Completion of the utility work described in Table 2.4.1 may result in temporary service disruptions to some utility users in the vicinity of the project area; however those disruptions would generally not exceed 3 hours.

During construction of the Build Alternatives, some impairment to the delivery of emergency services, including fire and police response times, may occur during overnight mainline, ramp, and arterial closures. All of the Build Alternatives would require the overnight closure of the southbound SR-55 mainline between MacArthur Boulevard and Interstate 405 (I-405) and between Dyer Road and MacArthur Boulevard. In addition, the overnight closure of the northbound SR-55 mainline between Edinger Avenue and McFadden Avenue would be required. Detour routes would be provided to direct traffic around the mainline closures using the local arterial street network. Emergency services providers (including the local fire and police departments and the California Highway Patrol) could experience these travel

Table 2.4.1: Potential Effects on Utility Facilities During Construction of Alternatives 1, 2, 3, and 4

Utility Provider	Description of Facility	Project Effect (Removal, Relocation or Protection in Place)	Alt 1	Alt 2	Alt 3	Alt 4
City of Santa Ana	12" water line in 20" casing	SR-55 crossing would be relocated (jack and bore)	●	●	●	●
	24" water line in 30" casing	SR-55 crossing would be relocated (jack and bore)	●	●	●	●
	Pressure reducing facility	Would be reconstructed west of SR-55	●	●	●	●
	3 fire hydrants, 3 water service lines, 3 fire service lines, and 5 valve cans	Would be relocated along Pullman Street between Dyer Road and Warner Avenue			●	●
	24" water line	Would be relocated along Ritchey Street on the west side of SR-55			●	●
Irvine Ranch Water District	8" vitrified clay pipe sewer	Would be relocated along Cowan Street on the east side of SR-55 between Main Street and MacArthur Boulevard, with a new manhole		●	●	
	5 fire hydrants, 6 water service lines, 6 fire service lines, and 10 valve cans	Would be relocated along Cowan Street on the east side of SR-55 between Main Street and MacArthur Boulevard		●	●	
Orange County Sanitation District	Sewer manhole	Would be removed from NB SR-55	●	●	●	●
	24" vitrified clay pipe sewer	Casing for the sewer line crossing would be extended east of SR-55	●	●	●	●
	15" vitrified clay pipe sewer	Would be relocated along the west side of SB SR-55	●	●	●	●
	15" vitrified clay pipe sewer	Would be relocated along Ritchey Street on the west side of SR-55			●	●
Southern California Edison (electricity)	Overhead 66 kV transmission line	Would be relocated underground along Cowan Street on the east side of SR-55 between Main Street and MacArthur Boulevard	●	●	●	●
	Overhead 66 kV transmission line	Would be relocated along the north and south sides of MacArthur Boulevard on the east side of SR-55	●	●	●	●
	Overhead 66 kV transmission line	Would be relocated with four steel and two wood poles along Pullman Street on the east side of SR-55 between MacArthur Boulevard and McGaw Avenue	●	●	●	●
	Overhead 66 kV transmission line	Would be relocated underground along Pullman Street on the east side of SR-55 between Garry Avenue and Carnegie Avenue	●	●	●	●
	Overhead 66 kV transmission lines	Would be relocated underground along Pullman Street on the east side of SR-55 and Warner Avenue	●	●	●	●
	Overhead distribution line	Would be relocated underground at the corner of Pullman Street and Carnegie Avenue	●	●	●	●
	Overhead 66 kV transmission line	Would be relocated along Ritchey Street on the west side of SR-55 and then cross SR-55 and continue along the east side of NB SR-55	●	●	●	●
	Underground line	Would be relocated along the west side of SB SR-55	●	●	●	●
	Overhead line	Would be relocated with two wood poles along the west side of SB SR-55	●	●	●	●
	Overhead 66 kV transmission line	Would be relocated		●	●	
	Overhead steel pole	Would be relocated on the east side of SR-55		●	●	
	Overhead 66 kV transmission line	Would be relocated with one wood pole along Cowan Street on the east side		●	●	

Table 2.4.1: Potential Effects on Utility Facilities During Construction of Alternatives 1, 2, 3, and 4

Utility Provider	Description of Facility	Project Effect (Removal, Relocation or Protection in Place)	Alt 1	Alt 2	Alt 3	Alt 4
		of SR-55 between Main Street and MacArthur Boulevard				
	Underground 12 kV distribution line	Would be relocated along Cowan Street on the east side of SR-55 between Main Street and MacArthur Boulevard		●	●	
	Pole anchor	Would be removed		●	●	●
	Wood pole	Would be replaced with a steel pole		●	●	●
	Pole anchor	Would be removed			●	●
	Wood pole	Would be replaced with a steel pole			●	●
Southern California Gas Company (natural gas)	30" high-pressure gas main	Casing for the gas line crossing would be extended	●	●	●	●
	4" gas line	Would be relocated along Pullman Street on the east side of SR-55 between Dyer Road and Warner Avenue	●	●	●	●
	30" high-pressure gas main	Would be relocated along the west side of SB SR-55	●	●	●	●
	2" gas line	Would be relocated along Cowan Street on the east		●	●	
	3" gas line	Would be relocated along Pullman Street on the east side of SR-55 between McGaw Avenue and Duryea Avenue			●	●
MWD	18" water line	Would be relocated (jack and bore casing)	●	●	●	●
Time Warner	Telecom cables	Would be relocated			●	●
AT&T	4" cable line	Casing for the cable line crossing would be extended west of SR-55	●	●	●	●
	Underground conduits	Would be relocated along Cowan Street on the east side of SR-55 between Main Street and MacArthur Boulevard		●	●	
	Underground conduits	Would be relocated along Pullman Street on the east side of SR-55			●	●

Source: *Community Impact Assessment* (2015).
● = utility impacted for Build Alternative
Alt = Alternative
kV = kilovolt
MWD = Metropolitan Water District
NB = northbound
SB = southbound
SR-55 = State Route 55

delays when traveling to/from emergency scenes during these mainline freeway closures.

All of the Build Alternatives would require overnight ramp closures. Alternative 3 would require the greatest number of ramp closures (20 ramps), while Alternative 1 would require the least number of ramp closures (12 ramps). Alternatives 2 and 4 would both require the closure of 19 ramps. Because these ramp closures are not expected to exceed 10 nights, they would not cause excessive inconvenience to the traveling public. No two consecutive off-ramps or two consecutive on-ramps in the same direction would be closed concurrently. As a result, emergency services providers, including the local fire and police departments and the California Highway Patrol, could experience travel delays when traveling to/from emergency scenes during these ramp closures.

Overnight closures on MacArthur Boulevard, Dyer Road, and Edinger Avenue would be required for all four Build Alternatives. No other local street closures would be required. As with the mainline closures, detour routes on other local streets would be provided to direct traffic around the closures. The potential detour routes would result in increased travel times ranging from approximately 4 to 12 minutes. Emergency services providers, including the local fire and police departments and the California Highway Patrol, could experience increased travel times when traveling to/from emergency scenes during the temporary closures on these local streets.

All mainline, arterial, and ramp closures would occur only during the overnight hours between 10:00 p.m. and 5:00 a.m. and on a short-term basis. The total number of overnight closures at each mainline and arterial location is not anticipated to exceed three nights (closures would not occur on consecutive nights). The total number of overnight closures at each ramp location is not anticipated to exceed 10 nights (closures may or may not occur on consecutive nights). All temporary mainline, ramp, and arterial road closures and detour plans would be coordinated with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times.

No Build Alternative

No improvements to SR-55 other than routine maintenance are proposed under the No Build Alternative. Therefore, the No Build Alternative would not result in temporary adverse effects on utilities and emergency services.

2.4.2.2 Permanent Impacts

Build Alternatives

Any relocation or other effects to utility facilities under the Build Alternatives would occur during the final design or construction phase. All existing utility facilities would be permanently maintained under the Build Alternatives. The Build Alternatives would not result in increased demand for domestic water services, wastewater facilities, or solid waste disposal. Therefore, the Build Alternatives would not result in permanent adverse effects on utility facilities and providers.

As required by Caltrans and the respective standards of the affected cities, emergency access would be maintained or provided as part of the final design of the Build Alternatives. The improvements to the SR-55 mainline under the Build Alternatives would reduce traffic congestion and result in decreased travel times on SR-55 between Interstate 5 (I-5) and I-405 compared to the No Build Alternative. These improvements in traffic flow are likely to improve emergency response times within the study area. Therefore, the Build Alternatives would not result in adverse effects on emergency services and providers.

No Build Alternative

No improvements to SR-55 are proposed under the No Build Alternative other than routine maintenance. Therefore, the No Build Alternative would not result in permanent adverse effects related to emergency service and utility facilities and services.

2.4.3 Avoidance, Minimization, and/or Mitigation Measures

The following measures have been incorporated in the Build Alternatives to address the potential temporary adverse effects of the project construction on utilities and emergency services.

UES-1 During final design, utility relocation plans will be prepared in consultation with the affected utility providers/owners for those utilities that will need to be relocated, removed, or protected in-place. If relocation is necessary, the final design will focus on relocating utilities within the State right of way (ROW) or other existing public ROWs and/or easements. If relocation outside of existing ROWs or additional public ROWs and/or easements required for the project are necessary, the final design will focus on relocating those facilities to minimize environmental impacts as a result of project construction and

ongoing maintenance and repair activities. The utility relocation plans will be included in the project specifications.

Prior to and during construction, the contractor will implement the components of the utility relocation plans provided in the project specifications.

Prior to utility relocation activities, the contractor will coordinate with affected utility providers regarding potential utility relocations and inform affected utility users in advance about the date and timing of potential service disruptions.

UES-2 Prior to and during construction, the contractor will coordinate all temporary mainline, ramp, and arterial roadway closures and detour plans with law enforcement, fire protection, and emergency medical service providers to minimize temporary delays in emergency response times, including the identification of alternative routes for emergency vehicles and routes across the construction areas that are developed in coordination with the affected agencies.

In addition to these measures, temporary construction impacts to emergency services would be minimized by implementation of Measure T-1 in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities. Measure T-1 requires development and implementation of a Transportation Management Plan (TMP) during construction of the Build Alternatives to address traffic delays; maintain traffic flow in the SR-55 corridor; manage detours and temporary road, lane, and ramp closures; provide ongoing information to the public regarding construction activities, closures, and detours; and maintain a safe environment for construction workers and travelers.

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2.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.5.1 Regulatory Setting

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

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

2.5.2 Affected Environment

2.5.2.1 Existing SR-55 Facilities

This section is based on the *Final Traffic Operation Report* (2015) and the *Community Impact Assessment* (2015) for the project.

As discussed earlier in Chapter 1, Proposed Project, State Route 55 (SR-55) is a major north-south freeway in central and coastal Orange County that has interchanges with State Route 73 (SR-73) near the southern terminus of SR-55, Interstate 405 (I-405), Interstate 5 (I-5), State Route 22 (SR-22), and SR-91 (SR-91) on the north. The project segment of SR-55 between I-405 and I-5, shown earlier on Figure 1-1 in Chapter 1, traverses a highly urbanized, densely populated area with closely spaced interchanges with arterial streets and other freeways. The operational characteristics of the project segment of SR-55 are influenced by a concentration of merge, diverge, and weaving operations associated with those tightly spaced interchanges.

The existing lane and ramp configurations on the project segment of SR-55 were shown on Figure 1-2 in Chapter 1. As shown on that figure, the project segment of SR-55 generally consists of one high-occupancy vehicle (HOV) lane and four general-purpose lanes in each direction, with auxiliary lanes provided at some locations. All the on-ramps except for freeway-to-freeway connector ramps on the project segment of SR-55 are currently metered.

2.5.2.2 Existing Traffic Operations

Existing Levels of Service

As discussed in Section 1.2.2.1, Capacity, Transportation Demand and Safety, in the subsection titled "Capacity and Demand in the SR-55 Corridor," existing traffic volumes on SR-55 have reached or are approaching the capacity of the freeway during the morning and afternoon peak periods.[1] SR-55 is a highly congested corridor, and one of the top bottlenecks in Orange County is on northbound SR-55 at Dyer Road. There is heavy congestion on SR-55 during peak periods, especially on southbound SR-55 north of Edinger Avenue in the AM peak period and on the entire project segment of northbound SR-55 in the PM peak period. During peak periods, those segments of SR-55 currently operate at levels of service (LOS) E or F with an average travel speed of less than 20 miles per hour (mph).

Existing traffic conditions described in this section and in Section 1.2.2.1 are based on traffic counts and traffic conditions in 2011. Table 1.1, provided earlier in Chapter 1, provides information on the average daily traffic (ADT) and existing traffic volumes during the AM and PM peak hours[2] on SR-55. As shown, there is strong directionality in traffic demand, generally with higher traffic volumes southbound in the AM peak hour and northbound in the PM peak hour.

Table 1.2, provided in Chapter 1, provides the existing LOS on SR-55 in the AM and PM peak hours. Consistent with the existing traffic volumes shown in Table 1.1 and the travel times and speeds discussed below, the poorest LOS (E and F) currently

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1 "Peak period" is defined as the entire morning or evening commute period. The AM peak period is from 6:00 a.m. to 10:00 a.m. The PM peak period is from 3:00 p.m. to 7:00 p.m.

2 "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes. The AM peak hour is from 7:00 a.m. to 8:00 a.m. The PM peak hour is from 4:00 p.m. to 5:00 p.m.

occur on southbound SR-55 in the AM peak hour and on northbound SR-55 in the PM peak hour.

Table 1.3, provided in Chapter 1, shows the existing condition on the HOV lanes on SR-55. Large segments of the HOV lanes currently operate at acceptable LOS in both directions during both peak periods, with LOS E and F occurring only at limited locations during peak periods.

Existing Travel Times and Speeds

Table 1.4, provided in Chapter 1, summarizes the existing peak-hour travel times and speeds on the northbound and southbound segments of SR-55. There is strong directionality in the traffic volumes between the AM and PM peak hours and peak directions that are clearly reflected in the travel times and speeds. As shown in Table 1.4, the highest travel times and lowest travel speeds are on southbound SR-55 in the AM peak hour and northbound SR-55 in the PM peak hour. The lowest travel times and highest travel speeds are on northbound SR-55 in the AM peak hour and southbound SR-55 in the PM peak hour.

Forecasted traffic volumes with and without the proposed project in 2020 and 2040 are discussed in detail later in Section 2.5.2.2, Permanent Impacts, in the subsections titled “Build Alternatives 1, 2, 3, and 4” and “No Build Alternative.”

HOV Degradation Determination

According to Section 1121 HOV Facilities (23 USC 166) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), an HOV facility is determined to be operating deficiently if the monitored speeds at the HOV facility during the AM or PM peak hour are less than 45 mph on 50 mph or greater facilities, or less than 10 mph below the posted limit on 50 mph or less facilities, for more than 10 percent of the time over a consecutive 180 days. Based on these criteria, the HOV facilities within the project area would need to maintain a 45 mph speed or better for a minimum of 117 weekdays to be performing at non-degraded operations. Table 2.5.1 summarizes the average travel speed,[1] the percentage of days operating under degraded conditions, and a determination of degradation for each HOV freeway segment within the project area. (Please note that the tables for this section are provided following the last page of text in this section.)

[1] The SR-55 HOV speed data were obtained from the California Department of Transportation (Caltrans) Performance Measurement System (PeMS) database.

The average traveling speed on the HOV lane along SR-55 is 62 mph in the northbound direction during the AM peak hour, 48 mph in the northbound direction during the PM peak hour, 58 mph in the southbound direction during the AM peak hour, and 61 mph in the southbound direction during the PM peak hour. As shown in Table 2.5.1, five HOV freeway segments are degraded on northbound SR-55 and three HOV freeway segments are degraded on southbound SR-55. In summary, SR-55 within the project area is degraded during the PM peak hour in the existing condition.

2.5.2.3 Pedestrian and Bicycle Facilities

Pedestrian travel across the project segment of SR-55 where arterial streets cross SR-55 is provided via sidewalks at the following locations:

- McFadden Avenue overcrossing
- Edinger Avenue undercrossing
- Warner Avenue overcrossing
- Dyer Road undercrossing
- MacArthur Boulevard undercrossing

These arterials generally include sidewalks on at least one side of the road segments as they cross SR-55. There are no designated on- or off-street bike lanes on these arterials; however, bicyclists can travel on all arterial crossings over or under SR-55 regardless of the provision of bike lanes. In addition, the City of Santa Ana Bikeway Master Plan designates Edinger Avenue and Dyer Road as future Class II bike lanes.

The BNSF Railway tracks cross the northern part of the project segment of SR-55. However, because the tracks are fenced in this area, the railroad right of way is not available for use by pedestrians and bicyclists.

The following Class I (off-street) bike paths are within 0.5 mile (mi) of the project segment of SR-55:

- On Anton Boulevard and Sakioka Drive in the City of Costa Mesa, approximately 0.2 mi west of the project segment of SR-55
- On Barranca Parkway east of Red Hill Avenue in the City of Irvine, approximately 0.4 mi east of the project segment of SR-55

There is a Class II (striped, on-street) bike lane on Red Hill Avenue between Nisson Road and El Camino Real in the City of Tustin. In addition, the City of Tustin Master

Bikeway Plan designates the entire length of Red Hill Avenue within the City limits as a future Class II bikeway. There are additional Class II bike lanes located along several other major arterials in the study area.

2.5.3 Environmental Consequences

The project limits are on SR-55 from north of I-405 (Post Mile 6.4) to south of the I-5 connectors (Post Mile 10.3). To evaluate the effects of traffic flow downstream and upstream of the project limits, the study area for the traffic operations analysis was extended south of I-405 to Paularino Avenue and north of I-5 to 4th Street/Irvine Boulevard. The traffic operations analysis considered all the freeway HOV and general-purpose lanes on SR-55 between Paularino Avenue and 4th Street/Irvine Boulevard; the freeway-to-freeway connectors from and to I-405 and I-5; all the northbound and southbound on- and off-ramps on SR-55 at the interchanges with Paularino Avenue, MacArthur Boulevard, Dyer Road, Edinger Avenue, McFadden Avenue, and 4th Street/Irvine Boulevard; and the following ramp intersections:

- Northbound SR-55 ramps at Paularino Avenue
- Southbound SR-55 ramps at Paularino Avenue
- Northbound SR-55 ramps at MacArthur Boulevard
- Southbound SR-55 ramps at MacArthur Boulevard
- Northbound SR-55 ramps/Dyer Road
- Grand Avenue at Dyer Road
- Southbound SR-55 ramps at Dyer Road
- Southbound SR-55 off-ramp at Grand Avenue
- Northbound SR-55 ramps at Edinger Avenue/Del Amo Avenue
- Southbound SR-55 ramps at Edinger Avenue/Auto Mall
- Northbound SR-55 ramps at McFadden Avenue
- Southbound SR-55 ramps at McFadden Avenue
- Northbound SR-55 ramps at 4th Street/Irvine Boulevard
- Southbound SR-55 ramps at 4th Street/Irvine Boulevard

The traffic impact analysis considered existing conditions and conditions under the No Build Alternative and the four Build Alternatives for 2020 and 2040 as follows:

- Existing Conditions (based on traffic data collected in 2011)
- No Build Alternative Opening Year 2020 and Design Year 2040
- Alternative 1 Opening Year 2020 and Design Year 2040
- Alternative 2 Opening Year 2020 and Design Year 2040

- Alternative 3 Opening Year 2020 and Design Year 2040
- Alternative 4 Opening Year 2020 and Design Year 2040

The methodologies for forecasting and assessing future year with and without project traffic effects are described in detail in Chapter 2, Traffic Analysis Methodology, in the *Final Traffic Operation Report*. The findings of those analyses are summarized below.

The analysis evaluation criteria used to determine acceptable traffic operating conditions are based on the LOS policies identified by Caltrans. Caltrans strives to have freeway facilities operate at LOS C or D. Freeway LOS were shown graphically on Figure 1-3 in Chapter 1. Based on Caltrans policies, LOS D was used as the threshold for the freeway facilities analysis. Any future freeway facilities projected to operate at unacceptable LOS (worse than LOS D) need to be mitigated. Per Caltrans, an impact to freeway facilities would be considered substantial if the project would:

- Degrade the LOS on the freeway facilities from LOS D to LOS E or F, or
- Impact a facility that is already operating at an unacceptable LOS E or F.

In addition to the interchange locations cited above, the traffic analysis considered the potential for Alternatives 3 and 4 to impact operations at local arterial intersections because the modifications to the McFadden Avenue northbound on-ramp would eliminate the direct access from the McFadden Avenue on-ramp to southbound I-5 and northbound SR-55, which could potentially result in the diversion of traffic to nearby local roads such as Newport Avenue and Red Hill Avenue. The following 12 intersections were included in the traffic analysis for Alternatives 3 and 4:

- Northbound I-5 on-ramp at Newport Avenue
- Southbound I-5 off-ramp at Newport Avenue
- Walnut Avenue at Newport Avenue
- Sycamore Avenue at Newport Avenue
- Edinger Avenue at Newport Avenue
- El Camino Real at Red Hill Avenue
- Northbound I-5 ramps at Red Hill Avenue
- Southbound I-5 ramps at Red Hill Avenue
- Nisson Road at Red Hill Avenue
- Walnut Avenue at Red Hill Avenue
- Sycamore Avenue at Red Hill Avenue

- Edinger Avenue at Red Hill Avenue

Based on discussions with the jurisdictions where these local intersections are located, the following LOS evaluation criteria were used for the operations analyses at these intersections:

- LOS D is identified as the desired LOS for the operation of the study area local intersections. LOS E and F are considered unacceptable operational conditions.
- An impact would be considered substantial if one of the following conditions is met during the analyzed peak hour:
  - The intersection would degrade from acceptable LOS D or better to LOS E or F; or
  - The average delay at the intersection would increase by 2 seconds if the intersection already operates at LOS E or F.

The No Build Alternative includes the following previously analyzed projects that are assumed to be in place under the No Build Alternative:

- **Southbound Auxiliary Lane from Edinger Avenue to Dyer Road:** This project was completed in 2012 after the existing year (2011) conditions established for the SR-55 Improvement Project between I-405 and I-5. It is shown on Figure 1-8 in Chapter 1 as "Improvements by Other Project Completed in 2012." As a result, this project was not considered to be part of the existing condition in the study area. It is included in the No Build Alternative and Build Alternative 3. In Build Alternatives 1, 2, and 4, this auxiliary lane would be converted to a general-purpose lane.
- **Southbound Auxiliary Lane from Dyer Road to MacArthur Boulevard:** This project has been constructed and is shown on Figure 1-2 as part of existing SR-55. It was included in the existing condition and is also included in the No Build Alternative and Build Alternatives 1, 3, and 4. In Build Alternative 2, this auxiliary lane would be converted to a general-purpose lane.
- **Continuous HOV Lane Access from Paularino Avenue to Meats Avenue:** This project has been implemented. This project was included in the existing condition and is included in the No Build Alternative and all four Build Alternatives.
- **Extension of Newport Avenue:** This improvement is not expected to be implemented by 2020 but is expected to be constructed and be part of the No Build Alternative by 2040. It was not included in the Build Alternatives for the

2020 traffic forecasts but was included in all four Build Alternatives for the 2040 forecasts.

The improvements in the Build Alternatives were shown in Chapter 1 on Figures 1-4 through 1-7 for Alternatives 1 through 4, respectively. Those improvements are described in more detail in Chapter 1, Proposed Project, in this environmental document, and in Chapter 4, Project Alternatives, in the *Final Traffic Operation Report*.

2.5.3.1 Temporary Impacts

Build Alternatives 1, 2, 3, and 4

The construction of the Build Alternatives would result in temporary impacts to traffic circulation and pedestrian and bicycle access on and in the vicinity of the project segment of SR-55. Those impacts could include short-term closures of freeway and arterial facilities and modifications to the existing facilities as described in the following sections. These temporary construction impacts would be similar for all the Build Alternatives.

Construction activities expected to require temporary closures of the SR-55 mainline, interchange ramps, and local arterials include:

- Installation, moving, and removal of construction barriers (k-rails)
- Pavement restriping
- Falsework erection and removal
- Construction of retaining walls and tie-back walls
- Widening of undercrossing structures and foundations
- Installation and removal of overhead signs and loop detectors
- Placement of concrete pavement using rapid set concrete, such as at ramp termini
- Asphalt and concrete pavement construction and overlay operations
- Utility work
- Extension or modifications of drainage channels

The total duration of construction activities under the Build Alternatives would range from approximately 520 to 780 days, depending on the Build Alternative and the number of contracts procured to build the improvements. Temporary closures of the SR-55 mainline, interchange ramps, and local arterials would be limited to overnight (between 10:00 p.m. and 5:00 a.m.) with limited durations.

In addition to temporary closures described above, the following temporary modifications to the existing freeway mainline, connector and ramp facilities, and arterial streets in the construction zone could be implemented during construction of the Build Alternatives:

- Narrowing of the widths of the travel lanes and shoulders
- Reductions in the number of available travel lanes
- Speed limit reductions

These temporary modifications would allow for traffic to pass through the project area on SR-55, the ramps, and the arterials, but those travelers would be expected to experience some delays as they travel on those facilities.

The proposed temporary closures of, and modifications to, the freeway and arterial facilities and the potential effects of those closures and modifications under the Build Alternatives are described in the following sections.

Temporary Mainline Closures and Other Modifications on SR-55

Table 2.5.2 summarizes the anticipated temporary closures on the SR-55 mainline during construction of the Build Alternatives, the proposed detour routes that would be provided during those closures, and the estimated increases in travel times for travelers required to exit the mainline freeway and travel around the closures on the detour routes. As shown, all four Build Alternatives would require temporary overnight closures of two segments of southbound SR-55 and one segment of northbound SR-55 to accommodate the installation and removal of overhead signage. Detours around the temporary mainline closures would be provided on local arterials in the vicinity of the closures. As shown in Table 2.5.2, the proposed detours around the temporarily closed mainline segments of SR-55 would result in increased travel times ranging from approximately 5 to 9 minutes.

During construction, the total number of travel lanes on the SR-55 mainline is expected to remain the same as existing conditions. However, the lane and shoulder widths would be temporarily narrowed to accommodate the placement of construction barriers. The speed limits on the segments of SR-55 with narrowed lanes may also be temporarily reduced.

Pedestrians and bicyclists are not allowed to travel on the SR-55 mainline. The temporary mainline closures and the temporary detours associated with those closures would not affect the existing Class I bike paths on the east and west sides of SR-55.

As a result, the mainline closures, delays, and increased travel times under all the Build Alternatives would not impact pedestrians and bicyclists or pedestrian and bicycle facilities.

Temporary Ramp Closures on SR-55

Table 2.5.3 summarizes the temporary ramp closures that would be required for each Build Alternative, the proposed detour routes that would be provided during those closures, and the estimated increases in travel times for travelers required to use the detour routes around the closed ramps. As shown, all four Build Alternatives would require temporary ramp closures. Alternative 3 would require the greatest number of ramp closures (20) and Alternative 1 would require the least number of ramp closures (12). The proposed detours around the temporarily closed ramps would result in increased travel times ranging from approximately 1 to 10 minutes.

The temporary ramp closures are not expected to occur for longer than 10 nights at any given ramp. No two consecutive on- or off-ramps in the same direction would be closed at the same time to minimize inconvenience to the traveling public.

Pedestrians and bicyclists are not allowed to travel on the SR-55 on- and off-ramps. The temporary ramp closures and the temporary detours associated with those closures would not affect the existing Class I bike paths on the east and west sides of SR-55. As a result, the ramp closures, delays, and increased travel times as a result of the mainline closures under all the Build Alternatives would not impact pedestrians and bicyclists or pedestrian and bicycle facilities.

Temporary Closures of Local Arterials

Table 2.5.4 summarizes the anticipated temporary overnight closures of local arterials during construction of the Build Alternatives, the proposed detour routes that would be provided during those closures, and the estimated increases in travel times for travelers required to travel around the closures on the detour routes. As shown, all four Build Alternatives would require temporary overnight closures of segments of MacArthur Boulevard, Dyer Road, and Edinger Avenue. All four Build Alternatives would require falsework for the widening of the Dyer Road and Edinger Avenue undercrossings. The erection and removal of the falsework at these undercrossings and the installation, moving, and removal of construction barriers for ramp work would require temporary overnight closures on segments of MacArthur Boulevard, Dyer Road, and Edinger Avenue for all four Build Alternatives. Slope paving required for the bridges at these crossings may also require temporary overnight

closures of one or two traffic lanes on MacArthur Boulevard, Dyer Road, and Edinger Avenue. No other local street closures would be required during construction of the four Build Alternatives.

As shown in Table 2.5.4, the proposed detours around the temporarily closed segments of these local arterials would result in increased travel times ranging from approximately 4 to 12 minutes.

The temporary closures of these arterial roads would also include closure of the sidewalks along those roads at their crossings of SR-55. The detours provided for vehicular traffic to travel around the closed arterials would also be signed for use by pedestrians and bicyclists. As a result, pedestrians and bicyclists who use those arterials would be required to travel north or south of the closed arterial to reach the closest open arterial crossing at SR-55. This would result in a longer travel path for both pedestrians and bicyclists and would substantially increase their travel times. However, the arterials would be closed only overnight and for very limited periods, which would minimize the effects of the closures on pedestrians and bicyclists.

The temporary arterial closures and the temporary detours associated with those closures would not affect the existing Class I bike paths on the east and west sides of SR-55. As a result, none of the closures under the Build Alternatives would impact those Class I bike paths or the pedestrians and bicyclists using those bike paths.

No Build Alternative

None of the improvements proposed in Build Alternatives 1, 2, 3, and 4 would be constructed under the No Build Alternative. As a result, the No Build Alternative would not result in temporary impacts related to traffic and circulation or to pedestrian or bicycle facilities.

2.5.3.2 Permanent Impacts

Build Alternatives 1, 2, 3, and 4

The following tables provide detailed information on the traffic operations under the Build and No Build Alternatives in the Opening Year (2020):

- **Table 2.5.5, 2020 SR-55 Mainline and Ramp Peak-Hour Levels of Service:** This table provides the LOS on the northbound and southbound SR-55 mainline and the on- and off-ramps in the AM and PM peak hours in 2020.

- **Table 2.5.6, 2020 SR-55 HOV Lane Peak-Hour Levels of Service:** This table provides the LOS for the northbound and southbound HOV lanes on the project segment of SR-55 in the AM and PM peak hours in 2020.
- **Table 2.5.7, 2020 SR-55 Intersection Peak-Hour Levels of Service:** This table provides the LOS for intersections between SR-55 and local arterials for the AM and PM peak hours in 2020.
- **Table 2.5.8, 2020 SR-55 Peak-Hour Travel Times and Speeds for General-Purpose Lanes:** This table provides the travel times and speeds on northbound and southbound SR-55 general purpose lanes in the AM and PM peak hours in 2020.
- **Table 2.5.9, 2020 SR-55 HOV Lane Peak-Hour Speeds and Travel Times:** This table provides the speeds and travel times on northbound and southbound SR-55 HOV lanes in the AM and PM peak hours in 2020.
- **Table 2.5.10, Summary of 2020 SR-55 Peak Operating Conditions:** This table summarizes the detailed operating conditions data for 2020 from Tables 2.5.4 through 2.5.7.
- **Table 2.5.11, 2020 Peak-Hour Local Intersection Operations:** This table provides the delay in seconds and LOS at local arterial intersections evaluated under Alternatives 3 and 4 for the AM and PM peak hours in 2020.

The following tables provide detailed information on the traffic operations under the Build and No Build Alternatives in the Design Year (2040):

- **Table 2.5.12, 2040 SR-55 Mainline and Ramp Peak-Hour Levels of Service:** This table provides the LOS on the northbound and southbound SR-55 mainline and its on- and off-ramps in the AM and PM peak hours in 2040.
- **Table 2.5.13, 2040 SR-55 HOV Lane Peak-Hour Levels of Service:** This table provides the LOS for the northbound and southbound HOV lanes on the project segment of SR-55 in the AM and PM peak hours in 2040.
- **Table 2.5.14, 2040 SR-55 Intersection Peak-Hour Levels of Service:** This table provides the LOS for intersections between SR-55 and local arterials for the AM and PM peak hours in 2040.
- **Table 2.5.15, 2040 SR-55 Peak-Hour Travel Times and Speeds for General-Purpose Lanes:** This table provides the travel times and speeds on northbound and southbound SR-55 general purpose lanes in the AM and PM peak hours in 2040.

- **Table 2.5.16, 2040 SR-55 HOV Lane Peak-Hour Speeds and Travel Times:** This table provides the speeds and travel times on northbound and southbound SR-55 HOV lanes in the AM and PM peak hours in 2040.
- **Table 2.5.17, Summary of 2040 SR-55 Peak Operating Conditions:** This table summarizes the detailed operating conditions data for 2040 from Tables 2.5.11 through 2.5.16.
- **Table 2.5.18, 2040 Peak-Hour Local Intersection Operations:** This table provides the delay in seconds and LOS at local arterial intersections evaluated under Alternatives 3 and 4 for the AM and PM peak hours in 2040.

As noted above, 2020 represents the project opening year, and 2040 represents the project build-out year. The traffic operations under the Build and No Build Alternatives in 2020 and 2040 are discussed by alternative below.

Alternative 1 – 2020

- **2020 AM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9, and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 1 would:
  - Two additional freeway segments would operate at LOS E or F under Alternative 1 compared to the No Build Alternative as a result of the higher traffic demand served by Alternative 1.
  - Reduce the southbound and northbound SR-55 peak hour travel times on the general purpose lanes by 1 percent.
  - One additional HOV segment on southbound SR-55 would operate at LOS E or F due to more traffic demand served by Alternative 1.
  - Increase southbound SR-55 peak hour travel times on the HOV lane by 30% due to more traffic demand served by Alternative 1.
  - Reduce the network vehicle hours of delay by 18 percent while serving more traffic through the network.
- **2020 PM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9, and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 1 would:
  - Two additional freeway segments would operate at LOS E or F under Alternative 1 compared to the No Build Alternative as a result of the higher traffic demand served by Alternative 1.

- Increase northbound and southbound SR-55 peak hour travel times on the HOV lanes by 6% and 4% respectively, due to more traffic demand served by Alternative 1.
- Reduce the network vehicle hours of delay by 7 percent while serving more traffic through the network.

Alternative 1 – 2040

- **2040 AM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 1 would:
  - Two additional freeway segments would operate at LOS E or F due to the higher traffic demand served by Alternative 1.
  - Increase the northbound SR-55 peak hour travel times on the general purpose lanes by 2 percent, due to more traffic served by the freeway facility.
  - One additional HOV segment on southbound SR-55 would operate at LOS E or F due to more traffic demand served by Alternative 1.
  - Increase southbound SR-55 peak hour travel times on the HOV lane by 37% due to more traffic demand served by Alternative 1.
  - Reduce the network vehicle hours of delay by 20 percent while serving more traffic through the network.
- **2040 PM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 1 would:
  - Increase the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 2 percent and 17 percent, respectively, due to more traffic served by the freeway facility.
  - Reduce northbound and southbound SR-55 peak hour travel times on the HOV lanes by 3% and 1%, respectively.
  - Reduce the network vehicle hours of delay by 17 percent while serving more traffic through the network.

Alternative 2 – 2020

- **2020 AM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 2 would:
  - Two additional freeway segments would operate at LOS E or F due to the higher traffic demand served by Alternative 2.
  - Reduce the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 3 percent and 8 percent, respectively.

  - One additional HOV segment would operate at LOS E or F due to more traffic demand served by Alternative 2.
  - Reduce southbound SR-55 peak hour travel times on the HOV lanes by 2%.
  - Reduce the network vehicle hours of delay by 34 percent while serving more traffic through the network.
- **2020 PM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 2 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at three freeway segments.
  - Reduce the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 15 percent.
  - Increase northbound SR-55 peak hour travel times on the HOV lane by 12% due to more traffic demand served by Alternative 2, while reduce southbound SR-55 peak hour travel times on the HOV lanes by 3%. .
  - Reduce the network vehicle hours of delay by 17 percent while serving more traffic through the network.

Alternative 2 – 2040

- **2040 AM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 2 would:
  - Increase the northbound SR-55 peak hour travel time on the general purpose lanes by 1 percent and decrease the southbound SR-55 travel time by 5 percent.
  - One additional HOV segment on southbound SR-55 would operate at LOS E or F due to more traffic demand served by Alternative 2.
  - Increase southbound SR-55 peak hour travel times on the HOV lane by 34% due to more traffic demand served by Alternative 2.
  - Reduce the network vehicle hours of delay by 25 percent while serving more traffic through the network.
- **2040 PM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 2 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at four freeway segments.
  - Reduce northbound SR-55 peak hour travel time on the general purpose lanes by 1 percent, and reduce southbound SR-55 travel time by 35 percent.

- Increase northbound SR-55 peak hour travel times on the HOV lane by 5% due to more traffic demand served by Alternative 2, while reduce southbound SR-55 peak hour travel times on the HOV lanes by 18%. .
- Reduce the network vehicle hours of delay by 20 percent while serving more traffic through the network.

Alternative 3 – 2020

- **2020 AM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 3 would:
  - Improve the LOS E and F under the No Build Alternative to acceptable LOS D or better at three freeway mainline segments.
  - Reduce the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 7 percent and 14 percent, respectively.
  - One additional HOV segment on southbound SR-55 would operate at LOS E or F due to more traffic demand served by Alternative 3.
  - Increase southbound SR-55 peak hour travel times on the HOV lane by 28% due to more traffic demand served by Alternative 3.
  - Reduce the network vehicle hours of delay by 51 percent while serving more traffic through the network.
- **2020 PM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 3 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at four freeway segments.
  - Reduce the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 12 percent and 16 percent, respectively.
  - Increase northbound SR-55 peak hour travel times on the HOV lane by 36% due to more traffic demand served by Alternative 3, while reduce southbound SR-55 peak hour travel times on the HOV lanes by 4%.
  - Reduce the network vehicle hours of delay by 28 percent while serving more traffic through the network.

Alternative 3 – 2040

- **2040 AM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 3 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at five freeway segments.

  - Reduce northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 6 percent and 5 percent, respectively.
  - One additional HOV segment on southbound SR-55 would operate at LOS E or F due to more traffic demand served by Alternative 3.
  - Increase southbound SR-55 peak hour travel times on the HOV lane by 45% due to more traffic demand served by Alternative 3.
  - Reduce the network vehicle hours of delay by 31 percent while serving more traffic through the network.
- **2040 PM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 3 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at four freeway segments.
  - Increase the northbound SR-55 peak hour travel time on the general purpose lanes by 1 percent and reduce the southbound SR-55 travel time by 34 percent, respectively.
  - Increase northbound SR-55 peak hour travel times on the HOV lane by 19% due to more traffic demand served by Alternative 3, while reduce southbound SR-55 peak hour travel times on the HOV lanes by 16%.
  - Reduce the network vehicle hours of delay by 40 percent while serving more traffic through the network.

Alternative 4 – 2020

- **2020 AM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 4 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at three freeway segments.
  - Reduce the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 5 percent and 17 percent, respectively.
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at one HOV segment.
  - Reduce northbound and southbound SR-55 peak hour travel times on the HOV lanes by 1% and 43%, respectively.
  - Reduce the network vehicle hours of delay by 53 percent while serving more traffic through the network.
- **2020 PM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, compared to the No Build Alternative, Alternative 4 would:

- One additional freeway segment would operate at LOS E or F due to the higher traffic demand served by Alternative 4.
- Reduce the northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 4 percent and 1 percent, respectively.
- Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at two HOV segments.
- Reduce northbound and southbound SR-55 peak hour travel times on the HOV lanes by 5% and 2%, respectively.
- Reduce the network vehicle hours of delay by 21 percent while serving more traffic through the network.

Alternative 4 – 2040

- **2040 AM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 4 would:
  - Four additional freeway segments would operate at LOS E or F due to the higher traffic demand served by Alternative 4.
  - Reduce northbound and southbound SR-55 peak hour travel times on the general purpose lanes by 2 percent and 7 percent, respectively.
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at one HOV segment.
  - Reduce northbound and southbound SR-55 peak hour travel times on the HOV lanes by 1% and 36%, respectively.
  - Reduce the network vehicle hours of delay by 33 percent while serving more traffic through the network.
- **2040 PM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, compared to the No Build Alternative, Alternative 4 would:
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at one freeway segment.
  - Reduce the northbound SR-55 peak hour travel time on the general purpose lanes by 1 percent and increase the southbound SR-55 travel time by 16 percent.
  - Improve the LOS E or F under the No Build Alternative to acceptable LOS D or better at two HOV segments.
  - Reduce northbound and southbound SR-55 peak hour travel times on the HOV lanes by 14% and 9%, respectively.

- Reduce the network vehicle hours of delay by 32 percent while serving more traffic through the network.

Comparison of the Performance of the Build Alternatives

Tables 2.5.10 and 2.5.17 summarize the performance of the No Build Alternative and the four Build Alternatives in the AM and PM peaks for the following operational characteristics in 2020 and 2040, respectively:

- Number of freeway segments operating at LOS D or better or LOS E/F
- Number of HOV lane segments operating at LOS D or better or LOS E/F
- Number of intersections operating at LOS D or better or LOS E/F
- Changes in general-purpose lane peak-hour travel times compared to the No Build Alternative
- Changes in HOV lane peak-hour travel times compared to the No Build Alternative
- Changes in peak-hour vehicle miles traveled (VMT) compared to the No Build Alternative
- Changes in peak-hour vehicle hour delay changes compared to the No Build Alternative

As shown in Table 2.5.10, the numbers of freeway segments, HOV lane segments, and study area intersections operating at LOS E/F would vary compared to the No Build Alternative in 2020 depending on the AM or PM peak period and Build Alternative. Depending on the Build Alternative:

- Vehicle travel times on the general purpose lanes in 2020 will be reduced up to 17 percent in the AM peak hour and 16 percent in the PM peak hour compared to the No Build Alternative.
- Vehicle travel times on the HOV lanes in 2020 will decrease up to 43 percent and increase up to 30 percent in the AM hour and decrease up to 5 percent and increase up to 36 percent in the PM peak hour.
- The number of people served in 2020 will increase by 0 to 2 percent in the AM peak period and 0 to 1 percent in the PM peak period.
- VMT in 2020 will increase in the AM peak period by 1 to 2 percent and in the PM peak period by up to 1 percent, compared to the No Build Alternative.
- Vehicle hours of delay in 2020 will be reduced between 18 and 53 percent in the AM peak period and between 7 and 28 percent in the PM peak period compared to the No Build Alternative.

These operational characteristics show that although the LOS may not improve on the freeway and HOV segments and at intersections in 2020, the total VMT and number of people served would increase and the vehicle hours of delay would be reduced substantially under the Build Alternatives compared to the No Build Alternative. As a result, the Build Alternatives will result in improved travel conditions and higher throughput compared to the No Build Alternative in 2020.

As shown in Table 2.5.17, the numbers of freeway segments operating at LOS E/F in the peak period would vary in the AM peak period and generally decrease in the PM peak period compared to the No Build Alternative in 2040. The number of HOV lane segments operating at LOS E/F would vary depending on the Alternative. In addition, the study area intersections operating at LOS E/F in the peak periods would either not change or would decrease compared to the No Build Alternative in 2040. However, depending on the Build Alternative:

- Vehicle travel times on the general purpose lanes in 2040 will decrease up to 7 percent and increase up to 2 percent in the AM hour and decrease up to 35 percent and increase up to 17 percent in the PM peak hour.
- Vehicle travel times on the HOV lanes in 2040 will decrease up to 36 percent and increase up to 45 percent in the AM hour and decrease up to 18 percent and increase up to 19 percent in the PM peak hour.
- The number of people served in 2040 will increase by 1 to 3 percent in the AM peak period and 1 to 4 percent in the PM peak period.
- VMT in 2040 will increase between 2 and 4 percent in the AM peak period and between 0 and 4 percent in the PM peak period compared to the No Build Alternative.
- Vehicle hours of delay in 2040 will be reduced between 20 percent and 33 percent in the AM peak period and between 17 percent and 40 percent in the PM peak period.

These operational characteristics show that although the LOS may not improve on the freeway and HOV segments and at intersections in 2040, the total VMT and number of people served would increase and the vehicle hours of delay would be reduced substantially under the Build Alternatives compared to the No Build Alternative. As a result, the Build Alternatives will result in improved travel conditions and higher throughput compared to the No Build Alternative in 2040.

Local Intersection Operations

Tables 2.5.11 and 2.5.18 summarize the 2020 and 2040 AM and PM peak-hour delay and LOS at local intersections under Alternatives 3 and 4, respectively.

As shown in Table 2.5.11, a majority of the intersections would operate with similar amounts of delay and with the same LOS under Alternatives 3 and 4 in 2020. However, the following intersection would be substantially impacted in 2020 under both Alternatives 3 and 4:

- **Northbound I-5 On-Ramp/Newport Avenue:** This intersection is currently unsignalized and the traffic from northbound Newport Avenue onto the northbound I-5 on-ramp has to yield to oncoming through traffic on southbound Newport Avenue. This movement currently operates at unacceptable LOS under existing conditions and any increased future demand would further exacerbate the delay at this location. In the 2020 No Build Alternative, this intersection would operate at LOS F during the AM and PM peak hours. The limited access at the McFadden Avenue on-ramp proposed under both Alternatives 3 and 4 would divert more traffic to use this location resulting in increased delay during the AM and PM peak hours.

As shown in Table 2.5.11, delay at local intersections under the No Build Alternative would vary substantially in the AM peak hour (i.e., from approximately 13 seconds at the southbound I-5 on-ramp at Red Hill Avenue to approximately 366 seconds at the northbound I-5 on-ramp at Newport Avenue). In the PM peak hour, the delay at local intersections would range from approximately 9 seconds at the Edinger Avenue/ Newport Avenue intersection to approximately 157 seconds at the Edinger Avenue/Red Hill Avenue intersection.

As shown in Table 2.5.11, with the improvement proposed for Alternatives 3 and 4, a majority of the intersections would operate with similar levels of delay and with the same LOS in 2020, with the exception of the northbound I-5 on-ramp at Newport Avenue. The delay at local intersections in 2020 under Alternatives 3 and 4 would continue to vary substantially in the AM peak hour (i.e., from approximately 13 seconds at the southbound I-5 off-ramp at Newport Avenue to approximately 678 seconds at the northbound I-5 on-ramp at Newport Avenue). In the PM peak hour, the delay at local intersections under Alternatives 3 and 4 would range from approximately 10 seconds at the Edinger Avenue/Newport Avenue intersection to approximately 173 seconds at the northbound I-5 on-ramp at Newport Avenue. Delay

at the northbound I-5 on-ramp at Newport Avenue intersection would increase from approximately 366 seconds for the No Build Alternative to approximately 671 seconds and 678 seconds for Alternatives 3 and 4, respectively.

As shown in Table 2.5.18, in 2040, a majority of local intersections would operate with similar amounts of delay and with the same LOS under Alternatives 3 and 4. However, the following intersection would be substantially impacted in 2040 under both Alternatives 3 and 4:

- **Northbound I-5 On-Ramp/Newport Avenue:** In the 2040 No Build Alternative, this intersection would operate at LOS F during the AM and PM peak hours. The limited access at the McFadden Avenue on-ramp would divert more traffic to use this location resulting in increased delay during peak hours under both Alternatives 3 and 4.

As shown in Table 2.5.18, delay at local intersections under the No Build Alternative would vary substantially in the AM hour (i.e. from 14 seconds at the southbound I-5 on-ramp at Red Hill Avenue to 549 seconds at the northbound I-5 on-ramp at Newport Avenue). In the PM Peak hour, the delay at local intersections would range from 17 seconds at the southbound I-5 on-ramp at Red Hill Avenue to 342 seconds at the northbound I-5 on-ramp at Newport Avenue.

As shown in Table 2.5.18, with the improvement proposed for Alternatives 3 and 4, a majority of the intersections would operate with similar amounts of delay and with the same LOS in 2040, with the exception of the northbound I-5 on-ramp at Newport Avenue. The delay at local intersections in 2040 under Alternatives 3 and 4 would continue to vary substantially in the AM peak hour (i.e., from approximately 15 seconds at the southbound I-5 on-ramp at Red Hill Avenue to approximately 1,218 seconds at the northbound I-5 on-ramp at Newport Avenue). In the PM peak hour, the delay at local intersections under Alternatives 3 and 4 would range from approximately 18 seconds at the southbound I-5 on-ramp at Red Hill Avenue to approximately 549 seconds at the northbound I-5 on-ramp at Newport Avenue. Delay at the northbound I-5 on-ramp at Newport Avenue intersection would increase from approximately 550 seconds for the No Build Alternative to approximately 1,218 seconds and 1,175 seconds for Alternatives 3 and 4, respectively.

Pedestrian and Bicycle Facilities

The four Build Alternatives include minor modifications to existing arterials at their crossings of SR-55 to accommodate the permanent improvements to SR-55 and the

ramps provided by the Build Alternatives. The arterials closed temporarily and/or modified during construction would be returned to their existing cross sections no later than the completion of construction of the improvements in the Build Alternatives. The existing sidewalks on those arterials at their crossings of SR-55 would also be returned to their original or better conditions no later than the completion of construction. Specifically, at arterial crossings where modifications to the sidewalks are needed as part of the Build Alternatives, those modifications would be consistent with ADA accessibility requirements. The permanent improvements in the Build Alternatives would not affect the existing Class I bike paths on the east and west sides of SR-55.

Alternatives 1 and 2 would not modify or otherwise affect any of the Class II bike lanes in the study area. To accommodate the restriping of a second right-turn lane from northbound Red Hill Avenue to southbound I-5, Alternatives 3 and 4 would remove the Class II on-street bike lane along northbound Red Hill Avenue between Nisson Road and El Camino Real in the City of Tustin. Because this Class II bike lane segment does not connect to any other bike lanes and the City of Tustin has indicated there are no plans to extend this Class II bike lane north of El Camino Real or south of Nisson Road, the permanent removal of the segment of this Class II bike lane on Red Hill Avenue between Nisson Road and El Camino Real would not result in any gaps or disruptions in the regional bike lane network and would not interfere with the City of Tustin's bike lane planning efforts. Bicyclists would still be able to ride on this segment of Red Hill Avenue, in vehicle travel lanes, so access for bicyclists would be preserved on this section of Red Hill Avenue. Alternatives 3 and 4 would not affect other Class II bike lanes on other arterials in the study area.

No Build Alternative

No Build Alternative – 2020

- **2020 AM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, the No Build Alternative would result in 12 freeway locations and 2 HOV locations operating at LOS E or F during the AM peak.
- **2020 PM Peak:** As shown in detail in Tables 2.5.5 through 2.5.9 and summarized in Table 2.5.10, the No Build Alternative would result in 22 freeway locations, 1 HOV location, and 3 study area intersections operating at LOS E or F during the PM peak.

No Build Alternative – 2040

- **2040 AM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, the No Build Alternative would result in 14 freeway locations, 1 HOV location, and 1 study area intersection operating at LOS E or F during the AM peak.
- **2040 PM Peak:** As shown in detail in Tables 2.5.11 through 2.5.16 and summarized in Table 2.5.17, the No Build Alternative would result in 32 freeway locations, 1 HOV location, and 7 study area intersections operating at LOS E or F during the PM peak.

No Build Alternative Pedestrian and Bicycle Facilities

None of the improvements proposed in Build Alternatives 1, 2, 3, and 4 would be constructed under the No Build Alternative. As a result, the No Build Alternative would not result in permanent impacts related to pedestrian or bicycle facilities.

2.5.4 Avoidance, Minimization, and/or Mitigation Measures

2.5.4.1 Measures for Short-Term Traffic Impacts

The following measure addresses the potential for short-term impacts related to traffic and transportation during construction of all four Build Alternatives.

T-1 **Transportation Management Plan.** A Transportation Management Plan (TMP) will be developed during final design and will be implemented by the construction contractor during project construction to address short-term traffic circulation and access effects during project construction. Specifically, during final design, a qualified traffic engineer will prepare the TMP, which will include, but not be limited to, the elements described below to reduce traveler delays and enhance traveler safety during project construction. The TMP will be approved by the Orange County Transportation Authority (OCTA) and the California Department of Transportation (Caltrans) District 12 during final design and will be incorporated into the plans, specifications, and estimates.

The purpose of the TMP is to address the short-term traffic and transportation impacts during construction of the project. The objectives of the TMP are to:

- Maintain traffic safety during construction
- Effectively maintain an acceptable level of traffic flow throughout the transportation system during construction
- Minimize traffic delays and facilitate reduction of the overall duration of construction activities
- Minimize detours and impacts to pedestrians and bicyclists
- Foster public awareness of the project and related transportation and traffic impacts
- Achieve public acceptance of construction of the project and the TMP measures

The TMP will contain, but not be limited to, the following elements intended to reduce traveler delay and enhance traveler safety. These elements will be refined during final design and incorporated in the TMP for implementation during project construction.

- **Public Information/Public Awareness Campaign (PAC).** The primary goal of the PAC is to educate motorists, business owners and operators, residents, elected officials, and government agencies about project construction activities and associated transportation impacts. The PAC is an important tool for reaching target audiences with important construction project information and is anticipated to include, but not be limited to:

    - Rideshare information
    - Brochures and mailers
    - Media releases
    - Paid advertising
    - Public meetings
    - Broadcast fax and email services
    - Telephone hotline
    - Notification to targeted groups
    - Commercial traffic reporters/feeds
    - Project website
    - Visual information
    - Local cable television and news
    - Internet postings

- **Traveler Information Strategies.** The effective implementation of a traveler information system during construction is crucial for enabling motorists to make informed decisions about their travel plans and options with real-time traffic information. That real-time traffic information will include information on mainline, ramp, lane, and arterial closures and detours; travel delays; access to adjacent land uses; "businesses are open" signing; and other signing and information to assist travelers in navigating through, around, and in construction areas. Key components of the traveler information system are anticipated to include, but not be limited to:

  - Fixed and portable changeable message signs
  - Ground-mounted signs
  - Automated work zone information systems
  - Highway advisory radio
  - Lane closure website
  - Caltrans highway information network
  - Bicycle and pedestrian information
  - Commute Smart website

- **Incident Management.** Effective incident management will ensure that incidents in and near construction areas are cleared quickly and do not result in substantial delays for the traveling public in the vicinity of work zones. Incident management includes, but is not limited to:

  - Caltrans Construction Zone Enhanced Enforcement Program (COZEEP)
  - Freeway Service Patrol
  - Traffic surveillance stations
  - Caltrans Transportation Management Center
  - Traffic management team
  - Towing services

- **Construction Strategies.** The TMP will include procedures to lessen the transportation effects of project-related construction activities and will include, but not be limited to, consideration of the following:

- Conflicts with other projects and special events
- Construction staging alternatives
- Mainline lane closures
- Local road closures
- Ramp and connector closures (no two consecutive on- or off-ramps in the same direction would be closed at the same time)
- Pedestrian and bicycle detours and facility closures
- Traffic control improvements
- Coordination with other projects
- Project phasing
- Traffic screens
- Truck traffic restrictions

- **Demand Management.** Temporarily reducing the overall traffic volumes on the project segment of State Route 55 (SR-55) could reduce the short-term adverse effects of construction on traffic operations. The TMP will include, but not be limited to, the following strategies that could reduce vehicular demand in the study area during project construction:

  - Rideshare incentives
  - Transit services
  - Shuttle services
  - Variable work hours and telecommuting
  - Park-and-ride lots

- **Alternate Route Strategies.** The TMP will provide strategies for notifying motorists, pedestrians, and bicyclists of planned construction activities. This notification will allow travelers to make informed decisions about their travel plans, including the consideration of possible alternate routes. The TMP will finalize the detour and alternate routes for motorists, specifically addressing the following:

  - Mainline lane closures
  - Ramp/connector closures
  - Local road closures

- Temporary highway or shoulder use
- Local street improvements
- Temporary detours and closures of bicycle and pedestrian facilities
- Traffic signal coordination

The design/build contractor will implement the measures in the TMP during construction.

T-2 Prior to and during construction, the construction contractor will coordinate with OCTA Central Communications regarding all temporary mainline ramp and arterial closures and detour plans that would affect OCTA bus routes to minimize temporary delays to OCTA bus service.

2.5.4.2 Measures for Long-Term Impacts

The following mitigation measure would reduce impacts to the affected intersection (northbound I-5 on-ramp at Newport Avenue) for Alternatives 3 and 4:

T-3 If Alternative 3 or 4 is selected for implementation, the following improvements will be included in the design of the selected alternative, to be constructed as part of that alternative by 2020 (Opening Year):

- **Northbound I-5 On-Ramp/Newport Avenue:** Installation of a traffic signal at this intersection.

The following minimization measure would minimize any impacts resulting from the diverted traffic flow at the southbound I-5 off-ramp at Newport Avenue and the southbound I-5 on-ramp at Red Hill Avenue for Alternatives 3 and 4:

T-4 If Alternative 3 or 4 is selected for implementation, t the following improvements will be included in the design of the selected alternative, to be constructed no later than 2040 (Design Year):

- **Southbound I-5 Off-Ramp/Newport Avenue:** The following improvement would be implemented at this intersection:
  - Re-striping the shared left-through lane at the eastbound approach to be a shared left/through/right lane.

- **Southbound I-5 On-Ramp/Red Hill Avenue:** The following improvement would be implemented at this intersection:
  - Re-striping the northbound approach to provide a second right-turn lane to the southbound I-5 on-ramp.

2.5.4.3 Traffic Operations at Local Intersections after Mitigation

Implementation of the local intersection improvements in Measure T-3 included in the 2020 (Opening Year) improvements would result in the following changes in traffic operations at the intersection affected by Alternatives 3 and 4:

- **Northbound I-5 On-Ramp/Newport Avenue:** As shown in Tables 2.5.19 and 2.5.20, the effects of Alternatives 3 and 4 at this intersection in 2020 and 2040 would be mitigated based on the signalization of this intersection that is required as part of the 2020 (Opening Year) project features in Measure T-3. As a result, this intersection would operate at acceptable LOS during the AM and PM peak hours under Alternatives 3 and 4 in 2020 and 2040.

Table 2.5.1 SR-55 HOV Freeway Segment Average Speed and Degradation Determination

HOV Freeway Segment	AM Peak Hour			PM Peak Hour		
	Average Speed (mph)	% of Days under 45 mph	Degraded?	Average Speed (mph)	% of Days under 45 mph	Degraded?
Northbound						
Paularino Ave to I-405	65.2	0%	No	64.7	0%	No
I-405 to MacArthur Blvd	64.5	0%	No	56.5	0%	No
MacArthur Blvd to Dyer Rd	60.0	0%	No	32.4	82.2%	Yes
Dyer Rd to Edinger Ave	59.6	0%	No	37.8	84.5%	Yes
Edinger Ave to McFadden Ave	60.7	0%	No	38.8	88.4%	Yes
McFadden Ave to I-5	61.1	0%	No	41.4	72.9%	Yes
I-5 to Irvine Blvd	63.4	0%	No	43.7	60.5%	Yes
Irvine Blvd to 17th St	62.6	0%	No	52.1	0.8%	No
Entire NB Segment of SR-55 within the study area	61.8	0%	No	47.8	27.9%	Yes
Southbound						
17th St to Irvine Blvd	53.7	1.6%	No	66.4	0.8%	No
Irvine Blvd to I-5	42.6	62.0%	Yes	53.9	10.9%	Yes
I-5 to McFadden Ave	48.9	40.3%	Yes	55.1	10.9%	Yes
McFadden Ave to Edinger Ave	49.0	16.3%	Yes	54.1	8.5%	No
Edinger Ave to Dyer Rd	60.0	0%	No	59.7	0%	No
Dyer Rd to MacArthur Blvd	67.9	0.8%	No	67.7	0%	No
MacArthur Blvd to I-405	66.7	0.8%	No	66.6	0%	No
Entire SB Segment of SR-55 within the study area	57.9	1.6%	No	61.4	0%	No

Source: *Final Traffic Operation Report* (2015).

Note: The SR-55 HOV speed data was obtained from Caltrans Performance Measurement System (PeMS) database and provided by Caltrans. The timeframe used for this analysis was January 2011 to June 2011, which consists of 129 weekdays.

Ave = Avenue
Blvd = Boulevard
Caltrans = California Department of Transportation
HOV = high-occupancy vehicle
I-405 = Interstate 405
I-5 = Interstate 5
mph = miles per hour
NB = northbound
Rd = Road
SB = southbound
SR-55 = State Route 55
St = Street

Table 2.5.2 Temporary Mainline Closures on SR-55 During Construction of Alternatives 1, 2, 3, and 4

Mainline Segment	Estimated Duration (nights)[1]	Proposed Detour Route	Increase in Travel Time (minutes)
SB SR-55 between MacArthur Blvd off-ramp and NB I-405 connector to SB SR-55	3	MacArthur Blvd/Bristol St/Baker St	8
		MacArthur Blvd/NB I-405 connector	5
SB SR-55 between Dyer Rd (West) off-ramp and WB MacArthur Blvd on-ramp	3	Dyer Rd/Main St/MacArthur Blvd	5
		Dyer Rd/Red Hill Ave/MacArthur Blvd	5
NB SR-55 between Edinger Ave off-ramp and McFadden Ave on-ramp	3	Edinger Ave/Red Hill Ave/Sycamore Ave	6
		Edinger Ave/Grand Ave/McFadden Ave	9

Source: *Community Impact Assessment* (2015).

[1] Estimated duration refers to the time period that each mainline segment would be subject to overnight closures (all closures would occur between 10:00 p.m. and 5:00 a.m.). The overnight closures are not anticipated to occur on consecutive nights.

Ave = Avenue
Blvd = Boulevard
I-405 = Interstate 405
NB = northbound
SB = southbound
SR-55 = State Route 55
St = Street
WB = westbound

Table 2.5.3 Temporary Ramp Closures on SR-55 During Construction of Alternatives 1, 2, 3, and 4

Ramp	Estimated Duration (nights)[1]	Proposed Detour Route	Estimated Travel Delay (minutes)	Temporary Ramp Closures			
				Alt 1	Alt 2	Alt 3	Alt 4
NB SR-55 off-ramp to MacArthur Blvd	10	Baker St/Red Hill Ave	6	●	●	●	●
		Dyer Rd/Red Hill Ave	6				
EB MacArthur Blvd to NB SR-55 on-ramp	10	Main St/Dyer Rd	2		●	●	●
		Red Hill Ave/Dyer Rd	4				
WB MacArthur Blvd to NB SR-55 on-ramp	10	Red Hill Ave/Dyer Rd	2	●	●	●	●
		Main St/Dyer Rd	4				
EB MacArthur Blvd on-ramp to SB SR-55	10	Main St/Dyer Rd	4		●	●	●
		Red Hill Ave/Dyer Rd	7				
WB MacArthur Blvd to SB SR-55 on-ramp	10	Red Hill Ave/Dyer Rd	5		●	●	
		Main St/Dyer Rd	5				
SB SR-55 off-ramp to MacArthur Blvd	10	Dyer Rd/Red Hill Ave	6	●	●	●	●
		I-405/Bristol St	7				
NB SR-55 off-ramp to Dyer Rd	10	MacArthur Blvd/Red Hill Ave	5	●	●	●	●
		Edinger Ave/Red Hill Ave	6				
EB Dyer Rd on-ramp to NB SR-55	10	Main St/MacArthur Blvd	2	●	●	●	●
		Red Hill Ave/MacArthur Blvd	5				
WB Dyer Rd on-ramp to NB SR-55	10	Red Hill Ave/Edinger Ave	4	●	●	●	●
		Grand Ave/Edinger Ave	5				
Dyer Rd on-ramp to SB SR-55	10	Red Hill Ave/MacArthur Blvd	0	●	●	●	●
		Main St/MacArthur Blvd	4				
SB SR-55 off-ramp to Dyer Rd (East)	10	Dyer Rd (West) off-ramp	1		●	●	●
		Main St/MacArthur Blvd	5				
SB SR-55 off-ramp to Dyer Rd (West)	10	Dyer Rd (East) off-ramp	1			●	●
		Edinger Ave/Grand Ave	6				
NB SR-55 off-ramp to Edinger Ave	10	Dyer Rd/Edinger Ave	5	●	●	●	●
		Sycamore Ave/Red Hill Ave	7				
Edinger Ave on-ramp to NB SR-55	10	Grand Ave/McFadden Ave	1		●	●	●
		Red Hill Ave/Sycamore Ave	5				
Edinger Ave on-ramp to SB SR-55	10	Grand Ave/Dyer Rd	1	●	●	●	●
		Red Hill Ave/Dyer Rd	5				
SB SR-55 off-ramp to Edinger Ave	10	McFadden Ave/Grand Ave	7	●	●	●	●
		Grand Ave	6				
NB SR-55 off-ramp to McFadden Ave	10	Edinger Ave/Red Hill Ave/ Sycamore Ave	5		●	●	●
		Irvine Blvd/Newport Ave	10				
McFadden Ave on-ramp to NB SR-55	10	Sycamore Ave/Red Hill Ave/ Edinger Ave	6		●	●	●
McFadden Ave off-ramp to SB SR-55	10	Grand Ave/Edinger Ave	7	●	●	●	●
		Walnut Ave/Red Hill Ave/ Edinger Ave	6				
SB SR-55 off-ramp to McFadden Ave	10	Irvine Blvd/Grand Ave	9	●	●	●	●
		Edinger Ave/Grand Ave	7				
			Total Temporary Ramp Closures	**12**	**19**	**20**	**19**

Source: *Community Impact Assessment* (2015).

[1] Estimated duration refers to the time period that each ramp would be subject to overnight closures (all closures would occur between 10:00 p.m. and 5:00 a.m.). The overnight closures are not anticipated to occur on consecutive nights.

Alt = Alternative
Ave = Avenue
Blvd = Boulevard
EB = eastbound
I-405 = Interstate 405
NB = northbound
SB = southbound
SR-55 = State Route 55
St = Street
WB = westbound

Table 2.5.4 Temporary Closures of Local Arterials During Construction of Alternatives 1, 2, 3, and 4

Local Arterial (Direction)	Estimated Duration (nights)[1]	Proposed Detour Route	Estimated Travel Delay (Minutes)
MacArthur Blvd undercrossing (EB)	2	Main St/Red Hill Ave	4
		Main. St/Dyer Rd/Red Hill Ave	7
MacArthur Blvd undercrossing (WB)	2	Red Hill Ave/Main St	4
		Red Hill Ave/Dyer Rd/Main St	7
Dyer Rd undercrossing (EB)	2	Main St/MacArthur Blvd/Red Hill Ave	6
		Main St/Edinger Ave/Red Hill Ave	12
Dyer Rd undercrossing (WB)	2	Red Hill Ave/MacArthur Blvd/Main St	6
		Red Hill Ave/Edinger Ave/Main St	12
Edinger Ave undercrossing (EB)	2	Grand Ave/Warner Ave/Red Hill Ave	5
		Grand Ave/McFadden Ave/Pasadena Ave/Sycamore Ave/Red Hill Ave	8
Edinger Ave undercrossing (WB)	2	Red Hill Ave/Warner Ave/Grand Ave	5
		Red Hill Ave/Sycamore Ave/Pasadena Ave/McFadden Ave/Grand Ave	8

Source: *Community Impact Assessment* (2015).

[1] Estimated duration refers to the time period that each ramp would be subject to overnight closures (all closures would occur between 10:00 p.m. and 5:00 a.m.). The overnight closures are not anticipated to occur on consecutive nights.

Ave = Avenue
Blvd = Boulevard
EB = eastbound
Rd = Road
St = Street
WB = westbound

Table 2.5.5 2020 SR-55 Mainline and Ramp Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour LOS					
Northbound SR-55					
Paularino Ave On-ramp	F	F	F	F	F
SB I-405 On-ramp	D	D	D	D	D
NB I-405 On-ramp	C	D	C	C	D
MacArthur Blvd Off-ramp	C	D	C	C	D
MacArthur Blvd On-ramp (EB)	D	D	C	C	D
MacArthur Blvd On-ramp (WB)	D	C	C	C	C
Dyer Rd Off-ramp	D	C	C	C	C
Dyer Rd On-ramp (EB)	C	D	C	C	D
Dyer Rd On-ramp (WB)	D	C	C	C	C
Dyer Rd to Edinger Ave	D	C	C	C	C
Edinger Ave Off-ramp	D	C	C	C	C
Edinger Ave On-ramp	D	D	D	C	C
McFadden Ave Off-ramp	D	D	D	C	C
McFadden Ave On-ramp	E	E	E	C	C
NB I-5 Off-ramp	E	E	E	C	C
SB I-5 Off-ramp	B	B	B	B	B
Irvine Blvd Off-ramp	B	B	B	B	B
NB I-5 On-ramp	B	B	B	B	B
Southbound SR-55					
SB I-5 Off-ramp	F	F	F	F	F
4th St On-ramp	F	F	F	F	F
NB I-5 On-ramp	F	F	F	F	F
SB I-5 On-ramp	F	E	E	E	D
McFadden Ave Off-ramp	F	E	E	E	D
McFadden Ave On-ramp	F	D	D	D	D
Edinger Ave Off-ramp	F	D	D	D	D
Edinger Ave On-ramp	D	E	F	C	E
Edinger Ave to Dyer Rd	D	D	D	C	D
Grand Ave Off-ramp	D	F	D	C	D
Dyer Rd Off-ramp	F	F	F	D	E
Dyer Rd On-Ramp	D	E	E	D	F
MacArthur Blvd Off-ramp	D	E	E	D	F
MacArthur Blvd On-ramp (WB)	E	E	D	F	F
MacArthur Blvd On-ramp (EB)	D	D	E	F	D
SB I-405 Off-ramp	D	D	E	F	D
NB I-405 Off-ramp	D	D	D	D	D
Paularino Ave Off-ramp	D	D	D	D	D
PM Peak-Hour LOS					
Northbound SR-55					
Paularino Ave On-ramp	F	F	C	D	F
SB I-405 On-ramp	F	F	C	D	F
NB I-405 On-ramp	F	F	E	F	F
MacArthur Blvd Off-ramp	F	F	E	F	F
MacArthur Blvd On-ramp (EB)	F	F	F	F	F
MacArthur Blvd On-ramp (WB)	F	F	F	F	F
Dyer Rd Off-ramp	F	F	F	F	F
Dyer Rd On-ramp (EB)	F	F	F	F	F
Dyer Rd On-ramp (WB)	F	F	F	F	F
Dyer Rd to Edinger Ave	F	F	F	F	F
Edinger Ave Off-ramp	F	F	F	F	F
Edinger Ave On-ramp	F	F	F	F	F
McFadden Ave Off-ramp	F	F	F	F	F
McFadden Ave On-ramp	F	F	F	C	C
NB I-5 Off-ramp	F	F	F	F	F
SB I-5 Off-ramp	F	F	F	F	E
Irvine Blvd Off-ramp	F	F	F	F	E
NB I-5 On-ramp	F	F	F	F	F

Table 2.5.5 2020 SR-55 Mainline and Ramp Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Southbound SR-55					
SB I-5 Off-ramp	C	C	C	C	C
4th St On-ramp	C	C	C	C	C
NB I-5 On-ramp	D	D	D	D	D
SB I-5 On-ramp	D	D	D	D	D
McFadden Ave Off-ramp	D	D	D	D	D
McFadden Ave On-ramp	C	C	C	C	C
Edinger Ave Off-ramp	C	C	C	C	C
Edinger Ave On-ramp	D	D	C	C	D
Edinger Ave to Dyer Rd	D	**F**	D	C	**E**
Grand Ave Off-ramp	D	**F**	D	C	**F**
Dyer Rd Off-ramp	**F**	**F**	C	C	**F**
Dyer Rd On-ramp	**F**	**F**	**F**	C	**F**
MacArthur Blvd Off-ramp	**F**	**F**	D	C	**F**
MacArthur Blvd On-ramp (WB)	**F**	**F**	D	**F**	**F**
MacArthur Blvd On-ramp (EB)	D	D	**E**	**F**	D
SB I-405 Off-ramp	D	D	**E**	**F**	D
NB I-405 Off-ramp	D	D	D	D	D
Paularino Ave Off-ramp	D	D	D	D	D

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

Ave = Avenue
Blvd = Boulevard
EB = eastbound
I-405 = Interstate 405
I-5 = Interstate 5
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
SR-55 = State Route 55
St = Street
WB = westbound

Table 2.5.6 2020 SR-55 HOV Lane Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour LOS					
Northbound SR-55					
I-405 to MacArthur Blvd	A	A	A	A	A
MacArthur Blvd to Dyer Rd	B	B	B	B	A
Dyer Rd to Edinger Ave	B	B	B	B	A
Edinger Ave to McFadden Ave	B	B	B	B	A
McFadden Ave to I-5	A	A	A	A	A
Southbound SR-55					
I-5 to McFadden Ave	**F**	**F**	**F**	**F**	D
McFadden Ave to Edinger Ave	D	**F**	**F**	**F**	C
Edinger Ave to Dyer Rd	D	C	C	C	C
Dyer Rd to MacArthur Blvd	C	C	C	B	B
MacArthur Blvd to I-405	B	B	B	B	C
PM Peak-Hour LOS					
Northbound SR-55					
I-405 to MacArthur Blvd	A	A	A	A	A
MacArthur Blvd to Dyer Rd	C	C	C	C	B
Dyer Rd to Edinger Ave	**E**	**E**	**E**	**F**	D
Edinger Ave to McFadden Ave	**E**	**E**	**E**	**F**	D
McFadden Ave to I-5	B	B	B	B	B
Southbound SR-55					
I-5 to McFadden Ave	A	A	A	A	A
McFadden Ave to Edinger Ave	C	B	B	B	B
Edinger Ave to Dyer Rd	C	C	C	C	B
Dyer Rd to MacArthur Blvd	C	C	C	C	B
MacArthur Blvd to I-405	B	B	B	B	B

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

Ave = Avenue
Blvd = Boulevard
HOV = high-occupancy vehicle
I-405 = Interstate 405
I-5 = Interstate 5
LOS = levels of service
Rd = Road
SR-55 = State Route 55

Table 2.5.7 2020 SR-55 Intersection Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour LOS					
1. SR-55 SB/4th St	C	C	D	D	D
2. SR-55 NB/Irvine Blvd	C	C	C	C	C
3. SR-55 SB/Village Way	C	B	C	C	C
4. SR-55 NB/Pasadena Ave	A	A	A	A	A
5. SR-55 SB/Edinger Ave	C	C	C	C	C
6. SR-55 NB/Newport Ave	C	C	C	C	C
7. SR-55 SB/Grand Ave	A	B	A	A	A
8. SR-55 SB/Dyer Rd	C	C	B	C	B
9. Grand Ave/Dyer Rd	B	B	B	B	B
10. SR-55 NB/Dyer Rd	B	B	B	B	B
11. SR-55 SB/MacArthur Blvd	B	B	B	B	B
12. SR-55 NB/MacArthur Blvd	B	B	B	B	B
13. SR-55 SB/Paularino Ave	C	C	C	C	C
14. SR-55 NB/Paularino Ave	C	C	C	C	C
PM Peak-Hour LOS					
1. SR-55 SB/4th St	B	B	B	B	B
2. SR-55 NB/Irvine Blvd	B	B	B	B	B
3. SR-55 SB/Village Way	B	B	B	B	B
4. SR-55 NB/Pasadena Ave	A	A	A	A	A
5. SR-55 SB/Edinger Ave	C	C	C	C	C
6. SR-55 NB/Newport Ave	**F**	**F**	**F**	**F**	**F**
7. SR-55 SB/Grand Ave	A	A	B	A	A
8. SR-55 SB/Dyer Rd	C	C	C	C	C
9. Grand Ave/Dyer Rd	B	B	B	B	B
10. SR-55 NB/Dyer Rd	B	A	**F**	D	C
11. SR-55 SB/MacArthur Blvd	**E**	**E**	**F**	**F**	**E**
12. SR-55 NB/MacArthur Blvd	**F**	**E**	**F**	**F**	**E**
13. SR-55 SB/Paularino Ave	C	**E**	C	C	C
14. SR-55 NB/Paularino Ave	D	**F**	C	C	**E**

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

Ave = Avenue
Blvd = Boulevard
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
SR-55 = State Route 55
St = Street

Table 2.5.8 2020 SR-55 Peak-Hour Travel Times and Speeds for General-Purpose Lanes

Location	Mile	No Build Alternative		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)
AM Peak Hour											
Northbound SR-55											
Paularino Ave to I-405	0.5	00:54	31.3	00:53	31.9	00:56	30.2	00:56	30.2	00:50	33.8
I-405 to MacArthur Blvd	1.0	01:01	58.1	01:03	56.3	00:58	61.2	00:58	61.2	01:03	56.3
MacArthur Blvd to Dyer Rd	0.9	00:50	63.8	00:48	66.5	00:48	66.5	00:48	66.5	00:50	63.8
Dyer Rd to Edinger Ave	1.6	01:36	59.2	01:34	60.5	01:24	67.7	01:24	67.7	01:28	64.6
Edinger Ave to McFadden Ave	0.5	00:39	46.7	00:40	45.5	00:45	40.5	00:30	60.7	00:30	60.7
McFadden Ave to I-5	0.5	00:25	67.3	00:25	67.3	00:25	67.3	00:25	67.3	00:25	67.3
I-5 to Irvine Blvd	0.5	00:28	68.5	00:28	68.5	00:28	68.5	00:28	68.5	00:28	68.5
Northbound SR-55 Total[1]	**5.4**	**05:53**	**55.3**	**05:51**	**55.7**	**05:44**	**56.8**	**05:29**	**59.4**	**05:34**	**58.5**
Southbound SR-55											
4th St to I-5	0.5	02:31	12.7	01:58	16.2	01:50	17.4	01:50	17.4	01:30	21.3
I-5 to McFadden Ave	0.5	01:12	23.4	00:55	30.6	00:50	33.7	00:52	32.4	00:42	40.1
McFadden Ave to Edinger Ave	0.5	00:39	46.7	00:29	62.8	00:30	60.7	00:28	65.0	00:27	67.5
Edinger Ave to Dyer Rd	1.6	01:41	56.3	02:22	40.0	01:57	48.6	01:28	64.6	01:40	56.8
Dyer Rd to MacArthur Blvd	0.9	00:58	55.0	01:09	46.3	01:12	44.3	01:00	53.2	01:09	46.3
MacArthur Blvd to I-405	1.0	00:55	64.5	00:56	63.3	00:57	62.2	01:06	53.7	01:04	55.4
I-405 to Paularino[(1)]	0.5	00:25	67.7	00:26	65.1	00:26	65.1	00:26	65.1	00:26	65.1
Southbound SR-55 Total[1]	**5.4**	**08:21**	**39.0**	**08:15**	**39.5**	**07:42**	**39.5**	**07:10**	**45.4**	**06:58**	**46.7**
PM Peak Hour											
Northbound SR-55											
Paularino Ave to I-405	0.5	02:16	12.4	02:26	11.6	00:27	62.7	00:26	65.1	02:03	10.8
I-405 to MacArthur Blvd	1.0	05:23	11.0	05:24	10.9	02:03	28.8	02:26	24.3	04:45	10.9
MacArthur Blvd to Dyer Rd	0.9	03:58	13.4	03:53	13.7	04:35	11.6	04:43	11.3	03:43	13.4
Dyer Rd to Edinger Ave	1.6	04:04	23.3	04:20	21.9	05:51	16.2	06:01	15.7	05:35	21.9
Edinger Ave to McFadden Ave	0.5	01:14	24.6	01:07	27.2	01:31	20.0	01:30	20.2	01:09	27.2
McFadden Ave to I-5	0.5	01:14	22.7	01:05	25.9	00:59	28.5	00:56	30.0	00:32	25.9
I-5 to Irvine Blvd[(1)]	0.5	01:18	24.6	01:11	27.0	01:10	27.4	01:00	32.0	00:49	27.0
Northbound SR-55 Total[1]	**5.4**	**19:27**	**16.7**	**19:26**	**16.8**	**16:36**	**19.6**	**17:02**	**19.1**	**18:36**	**17.5**

Table 2.5.8 2020 SR-55 Peak-Hour Travel Times and Speeds for General-Purpose Lanes

Location	Mile	No Build Alternative		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)
Southbound SR-55											
4th St to I-5	0.5	00:30	63.9	00:30	63.9	00:30	63.9	00:30	63.9	00:30	63.9
I-5 to McFadden Ave	0.5	00:29	58.0	00:28	60.1	00:29	58.0	00:29	58.0	00:29	58.0
McFadden Ave to Edinger Ave	0.5	00:30	60.7	00:28	65.0	00:28	65.0	00:28	65.0	00:28	65.0
Edinger Ave to Dyer Rd	1.6	01:54	49.9	01:50	51.7	01:27	65.3	01:27	65.3	01:47	53.1
Dyer Rd to MacArthur Blvd	0.9	01:35	33.6	01:42	31.3	01:02	51.5	00:54	59.1	01:38	32.6
MacArthur Blvd to I-405	1.0	01:00	59.1	01:00	59.1	01:04	55.4	01:09	51.4	01:01	58.1
I-405 to Paularino(1)	0.5	00:27	62.7	00:26	65.1	00:29	58.3	00:27	62.7	00:27	62.7
Southbound SR-55 Total[1]	**5.4**	**06:25**	**50.7**	**06:24**	**50.9**	**05:29**	**59.4**	**05:24**	**60.3**	**06:20**	**51.4**

Source: Final Traffic Operation Report (2015).
Note: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
[1] Total travel time in minutes and average travel speed for the full segment of SR-55.
Ave = Avenue
I-405 = Interstate 405
I-5 = Interstate 5
min:sec = minutes:seconds
mph = miles per hour
Rd = Road
SR-55 = State Route 55
St = Street

Table 2.5.9 2020 SR-55 HOV Lane Peak-Hour Speeds and Travel Times

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour Speeds in mph (Travel Times in min:sec)					
Northbound SR-55					
I-405 to MacArthur Blvd	64 (0:55)	63 (0:56)	64 (0:55)	65 (0:55)	64 (0:55)
MacArthur Blvd to Dyer Rd	67 (0:48)	67 (0:48)	67 (0:48)	67 (0:48)	68 (0:47)
Dyer Rd to Edinger Ave	66 (1:26)	66 (1:26)	67 (1:25)	67 (1:25)	67 (1:25)
Edinger Ave to McFadden Ave	66 (0:28)	66 (0:28)	66 (0:28)	66 (0:28)	65 (0:28)
McFadden Ave to I-5	67 (0:25)	68 (0:25)	68 (0:25)	68 (0:25)	68 (0:25)
NB Total (I-405 to I-5)	***66 (4:02)***	***66 (4:03)***	***66 (4:01)***	***66 (4:01)***	***66 (4:00)***
Southbound SR-55					
I-5 to McFadden Ave	8 (3:30)	12 (2:20)	26 (1:05)	12 (2:20)	52 (0:32)
McFadden Ave to Edinger Ave	60 (0:30)	8 (3:48)	11 (2:46)	8 (3:48)	66 (0:28)
Edinger Ave to Dyer Rd	63 (1:30)	63 (1:30)	63 (1:30)	66 (1:26)	66 (1:26)
Dyer Rd to MacArthur Blvd	63 (0:51)	61 (0:52)	61 (0:52)	66 (0:48)	65 (0:49)
MacArthur Blvd to I-405	67 (0:53)	67 (0:53)	67 (0:53)	67 (0:53)	66 (0:54)
SB Total (I-5 to I-405)	***37 (7:14)***	***28 (9:23)***	***37 (7:06)***	***29 (9:15)***	***64 (4:09)***
PM Peak-Hour Speeds in mph (Travel Times in min:sec)					
Northbound SR-55					
I-405 to MacArthur Blvd	60 (0:59)	60 (0:59)	65 (0:55)	61 (0:58)	61 (0:58)
MacArthur Blvd to Dyer Rd	63 (0:51)	63 (0:51)	64 (0:50)	64 (0:50)	66 (0:48)
Dyer Rd to Edinger Ave	41 (2:19)	37 (2:34)	34 (2:47)	24 (3:57)	44 (2:09)
Edinger Ave to McFadden Ave	42 (0:43)	40 (0:46)	32 (0:57)	30 (1:01)	44 (0:41)
McFadden Ave to I-5	66 (0:25)	66 (0:25)	66 (0:25)	66 (0:25)	66 (0:25)
NB Total (I-405 to I-5)	***50 (5:17)***	***48 (5:35)***	***45 (5:54)***	***37 (7:11)***	***53 (5:01)***
Southbound SR-55					
I-5 to McFadden Ave	66 (0:25)	66 (0:25)	66 (0:25)	66 (0:25)	66 (0:25)
McFadden Ave to Edinger Ave	57 (0:32)	66 (0:28)	66 (0:28)	66 (0:28)	66 (0:28)
Edinger Ave to Dyer Rd	63 (1:30)	57 (1:40)	64 (1:29)	66 (1:28)	63 (1:30)
Dyer Rd to MacArthur Blvd	60 (0:53)	56 (0:57)	64 (0:50)	65 (0:49)	63 (0:51)
MacArthur Blvd to I-405	66 (0:54)	66 (0:54)	66 (0:54)	66 (0:54)	66 (0:54)
SB Total (I-5 to I-405)	***63 (4:14)***	***60 (4:24)***	***65 (4:06)***	***66 (4:04)***	***64 (4:08)***

Source: *Final Traffic Operation Report* (2015).
Note: ▇ indicates unacceptable LOS E or F conditions.
Travel times were calculated using the segment distance divided by the speeds.
"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
Ave = Avenue
Blvd = Boulevard
HOV = high-occupancy vehicle
I-405 = Interstate 405
I-5 = Interstate 5
LOS = levels of service
Rd = Road
SR-55 = State Route 55

Table 2.5.10 Summary of 2020 SR-55 Peak Operating Conditions

Measure of Effectiveness	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak Hour					
Number of Study Freeway Locations					
Peak-Hour LOS D or Better	24	22	22	27	27
Peak-Hour LOS E or F	12	14	14	9	9
Number of Study HOV Locations					
Peak-Hour LOS D or Better	8	8	8	8	10
Peak-Hour LOS E or F	2	2	2	2	0
Number of Study Intersections					
Peak-Hour LOS D or Better	14	14	14	14	14
Peak-Hour LOS E or F	0	0	0	0	0
Peak-Hour Travel Time Changes for General Purpose Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	-1%	-3%	-7%	-5%
Southbound SR-55	--	-1%	-8%	-14%	-17%
Peak-Hour Travel Time Changes for HOV Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	0%	0%	0%	-1%
Southbound SR-55	--	+30%	-2%	+28%	-43%
Peak-Period Number of People Served Changes[1] (compared to No Build Alternative)	--	+0%	+1%	+1%	+2%
Peak-Period Vehicle Miles Traveled Changes[1] (compared to No Build Alternative)	--	+1%	+1%	+2%	+2%
Peak-Period Vehicle Hours Delay Changes[1] (compared to No Build Alternative)	--	-18%	-34%	-51%	-53%
PM Peak Hour					
Number of Study Freeway Locations					
Peak-Hour LOS D or Better	14	12	17	18	13
Peak-Hour LOS E or F	22	24	19	18	23
Number of Study HOV Locations					
Peak-Hour LOS D or Better	9	8	8	8	10
Peak-Hour LOS E or F	1	2	2	2	0
Number of Study Intersections					
Peak-Hour LOS D or Better	11	9	10	11	10
Peak-Hour LOS E or F	3	5	4	3	4
Peak-Hour Travel Time Changes for General Purpose Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	0%	-15%	-12%	-4%
Southbound SR-55	--	0%	-15%	-16%	-1%
Peak-Hour Travel Time Changes for HOV Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	+6%	+12%	+36%	-5%
Southbound SR-55	--	+4%	-3%	-4%	-2%
Peak-Period Number of People Served Changes[1] (compared to No Build Alternative)	--	+0%	+1%	+1%	+1%
Peak-Period Vehicle Miles Traveled Changes[1] (compared to No Build Alternative)	--	+0%	+1%	+1%	0%
Peak-Period Vehicle Hours Delay Changes[1] (compared to No Build Alternative)	--	-7%	-17%	-28%	-21%

Source: Final Traffic Operation Report (2015).

Notes: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
"Peak period" is defined at the entire morning or evening commute period as follows: AM peak period – 7:00 to 11:00 a.m.; PM peak period – 4:00 to 8:00 p.m.

[1] Change in percentages compared to the No Build Alternative.

HOV = high-occupancy vehicle

LOS = levels of service

SR-55 = State Route 55

Table 2.5.11 2020 Peak-Hour Local Intersection Operations

Location	No Build Alternative		Alternative 3		Alternative 4	
	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS
AM Peak Hour						
I-5 NB On-Ramp/Newport Ave	366.1	**F**	671.0	**F**	677.6	**F**
I-5 SB Off-Ramp/Newport Ave	13.1	B	13.5	B	22.0	C
Walnut Ave/Newport Ave	69.8	**E**	70.5	**E**	70.3	**E**
Sycamore Ave/Newport Ave	19.8	B	17.9	B	17.3	B
Edinger Ave/Newport Ave	28.8	C	30.3	C	33.5	C
El Camino Real/Red Hill Ave	46.5	D	42.1	D	41.9	D
I-5 NB Ramps/Red Hill Ave	17.5	B	18.0	B	18.1	B
I-5 SB Ramps/Red Hill Ave	12.7	B	13.4	B	13.1	B
Nisson Rd/Red Hill Ave	15.5	B	15.7	B	15.5	B
Walnut Ave/Red Hill Ave	47.5	D	52.4	D	54.1	D
Sycamore Ave/Red Hill Ave	38.8	D	48.1	D	47.8	D
Edinger Ave/Red Hill Ave	112.8	**F**	113.7	**F**	112.8	**F**
PM Peak Hour						
I-5 NB On-Ramp/Newport Ave	101.9	**F**	172.7	**F**	170.8	**F**
I-5 SB Ramps/Newport Ave	18.1	B	18.5	B	18.5	B
Walnut Ave/Newport Ave	24.8	C	24.4	C	25.0	C
Sycamore Ave/Newport Ave	22.8	C	18.7	B	18.6	B
Edinger Ave/Newport Ave	9.4	A	9.6	A	9.4	A
El Camino Real/Red Hill Ave	30.0	C	30.1	C	30.5	C
I-5 NB Ramps/Red Hill Ave	18.6	B	18.5	B	18.6	B
I-5 SB Ramps/Red Hill Ave	20.1	C	12.5	B	12.5	B
Nisson Rd/Red Hill Ave	30.9	C	33.2	C	33.4	C
Walnut Ave/Red Hill Ave	34.3	C	41.8	D	40.7	D
Sycamore Ave/Red Hill Ave	21.1	C	21.5	C	21.6	C
Edinger Ave/Red Hill Ave	157.3	**F**	156.4	**F**	155.1	**F**

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

[1] Average delay reported for signalized intersections and worst-movement delay reported for SSSC intersections.

Ave = Avenue
I-5 = Interstate 5
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
sec = seconds
SSSC = side street stop-control

Table 2.5.12 2040 SR-55 Mainline and Ramp Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour LOS					
Northbound SR-55					
Paularino Ave On-ramp	F	F	F	F	F
SB I-405 On-ramp	D	E	D	D	E
NB I-405 On-ramp	D	E	C	C	E
MacArthur Blvd Off-ramp	D	E	C	C	E
MacArthur Blvd On-ramp (EB)	D	D	C	D	E
MacArthur Blvd On-ramp (WB)	D	C	C	C	C
Dyer Rd Off-ramp	D	C	C	C	C
Dyer Rd On-ramp (EB)	D	D	C	C	E
Dyer Rd On-ramp (WB)	D	C	C	C	C
Dyer Rd to Edinger Ave	D	C	C	C	C
Edinger Ave Off-ramp	D	C	C	C	C
Edinger Ave On-ramp	C	C	C	C	C
McFadden Ave Off-ramp	C	C	C	C	C
McFadden Ave On-ramp	E	E	F	C	D
NB I-5 Off-ramp	E	E	F	C	C
SB I-5 Off-ramp	C	C	C	C	B
Irvine Blvd Off-ramp	C	C	C	C	C
NB I-5 On-ramp	D	D	D	D	D
Southbound SR-55					
SB I-5 Off-ramp	F	F	F	F	E
4th St On-ramp	F	F	F	F	F
NB I-5 On-ramp	F	F	F	F	F
SB I-5 On-ramp	E	E	E	E	E
McFadden Ave Off-ramp	E	E	E	E	E
McFadden Ave On-ramp	E	C	C	D	D
Edinger Ave Off-ramp	E	C	C	D	D
Edinger Ave On-ramp	D	F	F	C	F
Edinger Ave to Dyer Rd	D	D	D	C	F
Grand Ave Off-ramp	D	E	D	C	F
Dyer Rd Off-ramp	F	F	E	D	F
Dyer Rd On-ramp	E	F	F	D	F
MacArthur Blvd Off-ramp	E	F	E	D	F
MacArthur Blvd On-ramp (WB)	E	F	D	F	F
MacArthur Blvd On-ramp (EB)	D	D	E	E	D
SB I-405 Off-ramp	D	D	E	E	D
NB I-405 Off-ramp	C	D	D	D	D
Paularino Ave Off-ramp	C	C	C	C	C
PM Peak-Hour LOS					
Northbound SR-55					
Paularino Ave On-ramp	F	F	F	F	F
SB I-405 On-ramp	F	F	F	F	F
NB I-405 On-ramp	F	F	F	F	F
MacArthur Blvd Off-ramp	F	F	F	F	F
MacArthur Blvd On-ramp (EB)	F	F	F	F	F
MacArthur Blvd On-ramp (WB)	F	F	F	F	F
Dyer Rd Off-ramp	F	F	F	F	F
Dyer Rd On-ramp (EB)	F	F	F	F	F
Dyer Rd On-ramp (WB)	F	F	F	F	F
Dyer Rd to Edinger Ave	F	F	F	F	F
Edinger Ave Off-ramp	F	F	F	F	F
Edinger Ave On-ramp	F	F	F	F	F
McFadden Ave Off-ramp	F	F	F	F	F
McFadden Ave On-ramp	F	F	F	E	D
NB I-5 Off-ramp	F	F	F	F	F
SB I-5 Off-ramp	F	F	F	F	F
Irvine Blvd Off-ramp	F	F	F	F	F
NB I-5 On-ramp	F	F	F	F	F

Table 2.5.12 2040 SR-55 Mainline and Ramp Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Southbound SR-55					
SB I-5 Off-ramp	E	F	E	E	F
4th St On-ramp	F	F	E	E	F
NB I-5 On-ramp	F	F	F	F	F
SB I-5 On-ramp	F	F	E	F	F
McFadden Ave Off-ramp	F	F	E	F	F
McFadden Ave On-ramp	E	F	C	C	F
Edinger Ave Off-ramp	E	F	C	C	F
Edinger Ave On-ramp	F	F	D	C	F
Edinger Ave to Dyer Rd	F	F	D	C	F
Grand Ave Off-ramp	F	F	D	C	F
Dyer Rd Off-ramp	F	F	D	F	F
Dyer Rd On-ramp	F	F	F	F	F
MacArthur Blvd Off-ramp	F	F	E	F	F
MacArthur Blvd On-ramp (WB)	F	F	F	F	F
MacArthur Blvd On-ramp (EB)	D	D	F	F	D
SB I-405 Off-ramp	D	D	F	F	D
NB I-405 Off-ramp	D	C	D	D	D
Paularino Ave Off-ramp	D	D	D	D	D

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

Ave = Avenue
Blvd = Boulevard
EB = eastbound
I-405 = Interstate 405
I-5 = Interstate 5
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
SR-55 = State Route 55
St = Street
WB = westbound

Table 2.5.13 2040 SR-55 HOV Lane Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour LOS					
Northbound SR-55					
I-405 to MacArthur Blvd	A	A	A	A	A
MacArthur Blvd to Dyer Rd	B	B	B	B	A
Dyer Rd to Edinger Ave	B	B	B	A	A
Edinger Ave to McFadden Ave	B	B	B	B	A
McFadden Ave to I-5	A	A	A	A	A
Southbound SR-55					
I-5 to McFadden Ave	**F**	**F**	**E**	**F**	C
McFadden Ave to Edinger Ave	D	**F**	**F**	**F**	C
Edinger Ave to Dyer Rd	C	C	C	C	C
Dyer Rd to MacArthur Blvd	B	C	B	D	C
MacArthur Blvd to I-405	B	B	B	B	C
PM Peak-Hour LOS					
Northbound SR-55					
I-405 to MacArthur Blvd	A	A	A	A	A
MacArthur Blvd to Dyer Rd	C	C	C	C	B
Dyer Rd to Edinger Ave	**F**	**F**	**F**	**F**	D
Edinger Ave to McFadden Ave	**E**	**E**	**E**	**F**	D
McFadden Ave to I-5	B	B	B	B	B
Southbound SR-55					
I-5 to McFadden Ave	C	D	B	B	D
McFadden Ave to Edinger Ave	C	B	B	B	B
Edinger Ave to Dyer Rd	D	D	C	C	B
Dyer Rd to MacArthur Blvd	D	D	C	C	B
MacArthur Blvd to I-405	B	B	B	B	B

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

Ave = Avenue
Blvd = Boulevard
HOV = high-occupancy vehicle
I-405 = Interstate 405
I-5 = Interstate 5
LOS = levels of service
Rd = Road
SR-55 = State Route 55

Table 2.5.14 2040 SR-55 Intersection Peak-Hour Levels of Service

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour LOS					
1. SR-55 SB/4th St	**E**	**E**	**E**	**E**	**F**
2. SR-55 NB/Irvine Blvd	C	C	C	C	C
3. SR-55 SB/Village Way	B	B	B	C	B
4. SR-55 NB/Pasadena Ave	C	C	C	B	B
5. SR-55 SB/Edinger Ave	C	C	C	C	C
6. SR-55 NB/Newport Ave	C	C	C	C	C
7. SR-55 SB/Grand Ave	A	B	B	B	B
8. SR-55 SB/Dyer Rd	B	B	B	B	B
9. Grand Ave/Dyer Rd	B	C	C	C	C
10. SR-55 NB/Dyer Rd	B	B	B	B	B
11. SR-55 SB/MacArthur Blvd	A	A	A	A	A
12. SR-55 NB/MacArthur Blvd	B	B	B	B	B
13. SR-55 SB/Paularino Ave	D	D	D	D	D
14. SR-55 NB/Paularino Ave	C	C	C	C	C
PM Peak-Hour LOS					
1. SR-55 SB/4th St	C	C	C	C	C
2. SR-55 NB/Irvine Blvd	B	B	B	B	C
3. SR-55 SB/Village Way	B	B	C	C	B
4. SR-55 NB/Pasadena Ave	**F**	**F**	**F**	A	A
5. SR-55 SB/Edinger Ave	C	C	C	C	C
6. SR-55 NB/Newport Ave	**F**	**F**	**F**	**F**	**F**
7. SR-55 SB/Grand Ave	A	A	B	B	B
8. SR-55 SB/Dyer Rd	C	C	C	C	C
9. Grand Ave/Dyer Rd	B	B	B	B	B
10. SR-55 NB/Dyer Rd	**F**	**F**	**F**	**F**	**F**
11. SR-55 SB/MacArthur Blvd	**E**	**E**	**E**	**E**	**E**
12. SR-55 NB/MacArthur Blvd	**F**	**F**	**F**	**F**	**E**
13. SR-55 SB/Paularino Ave	**E**	**F**	C	C	C
14. SR-55 NB/Paularino Ave	**F**	**F**	**F**	**F**	**F**

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

Ave = Avenue
Blvd = Boulevard
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
SR-55 = State Route 55
St = Street

Table 2.5.15 2040 SR-55 Peak-Hour Travel Times and Speeds for General-Purpose Lanes

Location	Mile	No Build Alternative		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)
AM Peak Hour											
Northbound SR-55											
Paularino Ave to I-405	0.5	01:12	23.5	01:12	23.5	01:17	22.0	01:00	28.2	01:06	25.6
I-405 to MacArthur Blvd	1.0	01:06	53.7	01:11	50.0	01:04	55.4	01:04	55.4	01:19	44.9
MacArthur Blvd to Dyer Rd	0.9	00:51	62.6	00:50	63.8	00:49	65.1	00:49	65.1	00:51	62.6
Dyer Rd to Edinger Ave	1.6	01:31	62.5	01:30	63.2	01:27	65.3	01:36	59.2	01:28	64.6
Edinger Ave to McFadden Ave	0.5	00:32	56.9	00:32	56.9	00:35	52.0	00:27	67.5	00:28	65.0
McFadden Ave to I-5	0.5	00:32	52.6	00:36	46.7	00:35	48.1	00:25	67.3	00:25	67.3
I-5 to Irvine Blvd	0.5	00:29	66.1	00:29	66.1	00:29	66.1	00:29	66.1	00:29	66.1
Total	**5.4**	**06:13**	**52.4**	**06:20**	**51.4**	**06:16**	**52.0**	**05:50**	**55.8**	**06:06**	**53.4**
Southbound SR-55											
4th St to I-5	0.5	v	15.0	01:53	17.0	01:53	17.0	01:47	17.9	01:15	25.6
I-5 to McFadden Ave	0.5	00:55	30.6	00:51	33.0	00:51	33.0	00:53	31.7	00:50	33.7
McFadden Ave to Edinger Ave	0.5	00:35	52.0	00:28	65.0	00:29	62.8	00:29	62.8	00:29	62.8
Edinger Ave to Dyer Rd	1.6	01:45	54.1	01:59	47.8	01:47	53.1	01:29	63.9	02:00	47.4
Dyer Rd to MacArthur Blvd	0.9	01:15	42.6	01:28	36.3	01:11	45.0	01:24	38.0	01:30	35.5
MacArthur Blvd to I-405	1.0	00:56	63.3	00:56	63.3	00:57	62.2	01:06	53.7	00:57	62.2
I-405 to Paularino	0.5	00:25	67.7	00:25	67.7	00:25	67.7	00:25	67.7	00:25	67.7
Total	**5.4**	**07:59**	**40.8**	**08:00**	**40.7**	**07:33**	**43.1**	**07:33**	**43.1**	**07:26**	**43.8**
PM Peak Hour											
Northbound SR-55											
Paularino Ave to I-405	0.5	02:22	11.9	02:25	11.7	01:10	24.2	01:18	21.7	02:25	11.7
I-405 to MacArthur Blvd	1.0	05:02	11.7	05:20	11.1	03:54	15.2	04:05	14.5	05:15	11.3
MacArthur Blvd to Dyer Rd	0.9	04:40	11.4	04:45	11.2	05:04	10.5	05:27	9.8	04:29	11.9
Dyer Rd to Edinger Ave	1.6	05:35	17.0	05:54	16.1	06:57	13.6	07:28	12.7	05:56	16.0
Edinger Ave to McFadden Ave	0.5	01:57	15.6	01:46	17.2	02:20	13.0	01:52	16.3	01:39	18.4
McFadden Ave to I-5	0.5	01:25	19.8	01:21	20.8	01:23	20.3	01:16	22.1	01:11	23.7
I-5 to Irvine Blvd	0.5	01:18	24.6	01:17	24.9	01:19	24.3	01:07	28.6	01:06	29.0
Total	**5.4**	**22:19**	**14.6**	**22:48**	**14.3**	**22:07**	**14.7**	**22:33**	**14.4**	**22:01**	**14.8**

Table 2.5.15 2040 SR-55 Peak-Hour Travel Times and Speeds for General-Purpose Lanes

Location	Mile	No Build Alternative		Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)	Travel Time (min:sec)	Travel Speed (mph)
Southbound SR-55											
4th St to I-5	0.5	00:55	34.9	01:10	27.4	00:38	50.5	00:38	50.5	01:10	27.4
I-5 to McFadden Ave	0.5	01:02	27.1	01:15	22.4	00:46	36.6	00:40	42.1	01:14	22.7
McFadden Ave to Edinger Ave	0.5	00:36	50.6	00:50	36.4	00:30	60.7	00:29	62.8	00:50	36.4
Edinger Ave to Dyer Rd	1.6	03:26	27.6	04:20	21.9	01:29	63.9	01:32	61.8	04:10	22.7
Dyer Rd to MacArthur Blvd	0.9	02:15	23.6	02:20	22.8	01:16	42.0	01:20	39.9	02:23	22.3
MacArthur Blvd to I-405	1.0	01:00	59.1	01:00	59.1	01:07	52.9	01:12	49.3	01:00	59.1
I-405 to Paularino	0.5	00:26	65.1	00:26	65.1	00:32	52.9	00:32	52.9	00:26	65.1
Total	**5.4**	**09:40**	**33.7**	**11:21**	**28.7**	**06:18**	**51.7**	**06:23**	**51.0**	**11:13**	**29.0**

Source: *Final Traffic Operation Report* (2015).
Note: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
Ave = Avenue
Blvd = Boulevard
I-405 = Interstate 405
I-5 = Interstate 5
min:sec = minutes:seconds
mph = miles per hour
Rd = Road
SR-55 = State Route 55
St = Street

Table 2.5.16 2040 SR-55 HOV Lane Peak-Hour Speeds and Travel Times

Location	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak-Hour Speeds in mph (Travel Times in min:sec)					
Northbound SR-55					
I-405 to MacArthur Blvd	64 (0:55)	64 (0:55)	64 (0:55)	65 (0:55)	64 (0:55)
MacArthur Blvd to Dyer Rd	67 (0:48)	67 (0:48)	67 (0:48)	67 (0:48)	68 (0:48)
Dyer Rd to Edinger Ave	66 (1:26)	66 (1:26)	67 (1:25)	65 (1:27)	67 (1:25)
Edinger Ave to McFadden Ave	66 (0:28)	66 (0:28)	66 (0:28)	65 (0:28)	67 (0:27)
McFadden Ave to I-5	66 (0:25)	66 (0:25)	66 (0:25)	67 (0:25)	67 (0:25)
NB Total (I-405 to I-5)	***66 (4:02)***	***66 (4:02)***	***66 (4:01)***	***66 (4:03)***	***67 (4:00)***
Southbound SR-55					
I-5 to McFadden Ave	10 (2:48)	20 (1:24)	23 (1:13)	14 (2:00)	56 (0:30)
McFadden Ave to Edinger Ave	60 (0:30)	7 (4:20)	7 (4:20)	7 (4:20)	66 (0:28)
Edinger Ave to Dyer Rd	63 (1:30)	63 (1:30)	63 (1:30)	65 (1:27)	64 (1:29)
Dyer Rd to MacArthur Blvd	63 (0:51)	63 (0:51)	63 (0:51)	66 (0:48)	63 (0:51)
MacArthur Blvd to I-405	67 (0:53)	67 (0:53)	67 (0:53)	67 (0:53)	66 (0:54)
SB Total (I-5 to I-405)	***41 (6:32)***	***30 (8:58)***	***30 (8:47)***	***28 (9:29)***	***64 (4:11)***
PM Peak-Hour Speeds in mph (Travel Times in min:sec)					
Northbound SR-55					
I-405 to MacArthur Blvd	60 (0:59)	59 (1:00)	60 (0:59)	60 (0:59)	62 (0:57)
MacArthur Blvd to Dyer Rd	62 (0:51)	62 (0:51)	63 (0:51)	63 (0:51)	65 (0:49)
Dyer Rd to Edinger Ave	33 (2:52)	34 (2:47)	30 (3:09)	25 (3:47)	43 (2:12)
Edinger Ave to McFadden Ave	38 (0:48)	44 (0:41)	38 (0:48)	30 (1:01)	42 (0:43)
McFadden Ave to I-5	64 (0:26)	62 (0:27)	62 (0:27)	63 (0:27)	66 (0:25)
NB Total (I-405 to I-5)	***45 (5:56)***	***46 (5:46)***	***43 (6:14)***	***38 (7:05)***	***52 (5:06)***
Southbound SR-55					
I-5 to McFadden Ave	47 (0:36)	46 (0:37)	62 (0:27)	60 (0:28)	46 (0:37)
McFadden Ave to Edinger Ave	53 (0:34)	66 (0:28)	66 (0:28)	66 (0:28)	66(0:28)
Edinger Ave to Dyer Rd	47 (2:01)	46 (2:04)	62 (1:32)	60 (1:35)	54 (1:45)
Dyer Rd to MacArthur Blvd	52 (1:01)	52 (1:01)	63 (0:51)	60 (0:53)	60 (0:53)
MacArthur Blvd to I-405	66 (0:54)	66 (0:54)	66 (0:54)	66 (0:54)	66 (0:54)
SB Total (I-5 to I-405)	***52 (5:06)***	***53 (5:04)***	***63 (4:12)***	***62 (4:18)***	***58 (4:37)***

Source: *Final Traffic Operation Report* (2015).
Notes: ▇ indicates unacceptable LOS E or F conditions.
Travel times were calculated using the segment distance divided by the speeds.
"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
Ave = Avenue
Blvd = Boulevard
HOV = high-occupancy vehicle
I-405 = Interstate 405
I-5 = Interstate 5
LOS = levels of service
Rd = Road
SR-55 = State Route 55

Table 2.5.17 Summary of 2040 SR-55 Peak Operating Conditions

Measure of Effectiveness	No Build Alternative	Alternative 1	Alternative 2	Alternative 3	Alternative 4
AM Peak Hour					
Number of Study Freeway Locations					
Peak-Hour LOS D or Better	22	20	22	27	18
Peak-Hour LOS E or F	14	16	14	9	18
Number of Study HOV Locations					
Peak-Hour LOS D or Better	9	8	8	8	10
Peak-Hour LOS E or F	1	2	2	2	0
Number of Study Intersections					
Peak-Hour LOS D or Better	13	13	13	13	13
Peak-Hour LOS E or F	1	1	1	1	1
Peak-Hour Travel Time Changes for General Purpose Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	+2%	+1%	-6%	-2%
Southbound SR-55	--	+0%	-5%	-5%	-7%
Peak-Hour Travel Time Changes for HOV Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	0%	0%	0%	-1%
Southbound SR-55	--	+37%	+34%	+45%	-36%
Peak-Period Number of People Served Changes[1] (compared to No Build Alternative)	--	+1%	+1%	+3%	+3%
Peak-Period Vehicle Miles Traveled Changes[1] (compared to No Build Alternative)	--	+2%	+3%	+3%	+4%
Peak-Period Vehicle Hours Delay Changes[1] (compared to No Build Alternative)	--	-20%	-25%	-31%	-33%
PM Peak Hour					
Number of Study Freeway Locations					
Peak-Hour LOS D or Better	4	4	8	8	5
Peak-Hour LOS E or F	32	32	28	28	31
Number of Study HOV Locations					
Peak-Hour LOS D or Better	9	8	8	8	10
Peak-Hour LOS E or F	1	2	2	2	0
Number of Study Intersections					
Peak-Hour LOS D or Better	7	7	8	9	9
Peak-Hour LOS E or F	7	7	6	5	5
Peak-Hour Travel Time Changes for General Purpose Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	+2%	-1%	+1%	-1%
Southbound SR-55	--	+17%	-35%	-34%	+16%
Peak-Hour Travel Time Changes for HOV Lanes[1] (compared to No Build Alternative)					
Northbound SR-55	--	-3%	+5%	+19%	-14%
Southbound SR-55	--	-1%	-18%	-16%	-9%
Peak-Period Number of People Served Changes[1] (compared to No Build Alternative)	--	+1%	+3%	+4%	+2%
Peak-Period Vehicle Miles Traveled Changes[1] (compared to No Build Alternative)	--	+0%	+4%	+4%	+3%
Peak-Period Vehicle Hours Delay Changes[1] (compared to No Build Alternative)	--	-17%	-20%	-40%	-32%

Source: *Final Traffic Operation Report* (2015).

Notes: "Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
"Peak period" is defined at the entire morning or evening commute period as follows: AM peak period – 7:00 to 11:00 a.m.; PM peak period – 4:00 to 8:00 a.m.

[1] Change in percentages compared to the No Build Alternative.

HOV = high-occupancy vehicle

LOS = levels of service

SR-55 = State Route 55

Table 2.5.18 2040 Peak-Hour Local Intersection Operations

Location	No Build Alternative		Alternative 3		Alternative 4	
	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS
AM Peak Hour						
I-5 NB On-Ramp/Newport Ave	549.6	**F**	1,217.7	**F**	1,175.4	**F**
I-5 SB Ramps/Newport Ave	26.0	C	24.6	C	24.3	C
Walnut Ave/Newport Ave	75.0	**E**	54.1	D	56.4	**E**
Sycamore Ave/Newport Ave	242.2	**F**	58.1	**E**	60.4	**E**
Edinger Ave/Newport Ave	178.3	**F**	164.3	**F**	165.7	**F**
El Camino Real/Red Hill Ave	65.1	**E**	62.7	**E**	61.7	**E**
I-5 NB Ramps/Red Hill Ave	16.8	B	18.9	B	18.1	B
I-5 SB Ramps/Red Hill Ave	14.6	B	16.0	B	14.0	B
Nisson Rd/Red Hill Ave	28.4	C	36.6	D	37.0	D
Walnut Ave/Red Hill Ave	38.3	D	36.5	D	35.4	D
Sycamore Ave/Red Hill Ave	19.6	B	19.6	B	18.9	B
Edinger Ave/Red Hill Ave	62.4	**E**	55.6	**E**	54.0	D
PM Peak Hour						
I-5 NB On-Ramp/Newport Ave	342.8	**F**	523.4	**F**	548.7	**F**
I-5 SB Ramps/Newport Ave	17.1	B	18.2	B	18.0	B
Walnut Ave/Newport Ave	27.7	C	32.3	C	29.1	C
Sycamore Ave/Newport Ave	144.1	**F**	72.8	**E**	35.9	D
Edinger Ave/Newport Ave	131.8	**F**	114.4	**F**	123.9	**F**
El Camino Real/Red Hill Ave	40.9	D	40.4	D	40.7	D
I-5 NB Ramps/Red Hill Ave	20.5	C	20.5	C	20.7	C
I-5 SB Ramps/Red Hill Ave	18.0	B	18.7	B	18.6	B
Nisson Rd/Red Hill Ave	40.5	D	44.5	D	44.5	D
Walnut Ave/Red Hill Ave	34.8	C	43.0	D	43.0	D
Sycamore Ave/Red Hill Ave	27.1	C	54.3	D	49.2	D
Edinger Ave/Red Hill Ave	107.8	**F**	94.9	**F**	100.5	**F**

Source: *Final Traffic Operation Report* (2015).

Notes: ▇ indicates unacceptable LOS E or F conditions.

"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.

[1] Average delay reported for signalized intersections and worst-movement delay reported for SSSC intersections.

Ave = Avenue
I-5 = Interstate 5
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
sec = seconds
SSSC = side street stop-control

Table 2.5.19 2020 Local Intersection Operations with Mitigation

Location	Alternative 3		Alternative 3 With Mitigation		Alternative 4		Alternative 4 With Mitigation	
	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS
AM Peak Hour								
I-5 NB On-Ramp/Newport Ave	671.0	**F**	14.6	B	677.6	**F**	14.6	B
PM Peak Hour								
I-5 NB On-Ramp/Newport Ave	172.7	**F**	7.9	A	170.8	**F**	8.0	A

Source: *Final Traffic Operation Report* (2015).
Notes: ▇ indicates unacceptable LOS E or F conditions.
"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
[1] Average delay reported for signalized intersections and worst-movement delay reported for SSSC intersections.
Ave = Avenue
I-5 = Interstate 5
LOS = levels of service
Rd = Road
SB = southbound
sec = seconds
SSSC = side street stop-control

Table 2.5.20 2040 Local Intersection Operations with Mitigation

Location	Alternative 3		Alternative 3 With Mitigation		Alternative 4		Alternative 4 With Mitigation	
	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS	Delay (sec)[1]	LOS
AM Peak Hour								
I-5 NB On-Ramp/Newport Ave	1217.7	**F**	24.7	C	1175.4	**F**	24.1	C
PM Peak Hour								
I-5 NB On-Ramp/Newport Ave	523.4	**F**	16.0	B	548.7	**F**	16.5	B

Source: *Final Traffic Operation Report* (2015).
Notes: ▇ indicates unacceptable LOS E or F conditions.
"Peak hour" is defined as the 1 hour during the morning or evening commute that has the highest traffic volumes as follows: AM peak hour – 8:00 to 9:00 a.m.; PM peak hour – 5:00 to 6:00 p.m.
[1] Average delay reported for signalized intersections and worst-movement delay reported for SSSC intersections.
Ave = Avenue
I-5 = Interstate 5
LOS = levels of service
NB = northbound
Rd = Road
SB = southbound
SSSC = side street stop-control

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2.6 Visual/Aesthetics

2.6.1 Regulatory Setting

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

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

2.6.2 Affected Environment

This information in this section is based on the *Visual Impact Assessment* (VIA) (2015).

2.6.2.1 Definitions of Terms

Many different terms are utilized in this section to describe the project based on the context of the discussion. To assist the reader with understanding how the project is described within this section, the following list defines these terms as used in this section:

- **Project Area:** The geographic area that includes the project site and areas visible from the project site as well as areas outside of the project site where the project would be visible.
- **Project Limits/Project Segment:** The area that defines the limits of the project, including areas where any project activities may occur. This includes areas where temporary disturbances may occur as well as where improvements would be built.
- **Project Corridor:** The environment that is visible and that depicts a relationship to State Route 55 (SR-55). This includes visible features within the project limits as well as visible features of the project area as viewed from the project site. The project corridor is the area of land that is visible from, adjacent to, and outside the

highway right of way, and is determined by topography, vegetation, and viewing distance.

- **Viewshed:** The surface area that is visible from a key viewpoint. The viewshed extends to all areas that have a view of and from a project site, and identifies potential views that a proposed project could affect.
- **Viewer Group:** A group of persons that might be affected by the introduction of a project into a viewshed based on location, activity, and length of exposure to a view. The viewer groups will respond differently to the same visual changes based on their visual preferences.
- **Key Views:** Representations of typical landscape views within the study area that incorporate a range of visual resources as seen by viewer groups.

2.6.2.2 Visual Setting

The proposed project is located along SR-55 in the Cities of Santa Ana, Tustin, and Irvine in Orange County, California. The project segment of SR-55 is in the South Coast subregion of the Southwestern California region of the California Floristic Province. The South Coast subregion is characterized by valleys and small hills extending from the coast inland to the foothills of the Transverse and Peninsular Mountain ranges. The project corridor is characterized by relatively flat terrain, ranging from approximately 35 to 125 feet (ft) in elevation; is fully developed with industrial, commercial, hotel, and residential uses; and contains areas of ruderal and ornamental vegetation. Industrial, office, utility, and commercial uses are generally located along the southern three-fourths of the project segment of SR-55. There are high- and medium-density residential uses and some commercial uses adjacent to the northernmost part of the project segment of SR-55. The project corridor also includes utility corridors, BNSF Railway tracks, and flood control/drainage facilities, including the Santa Fe-Santa Ana Channel and the Lane Channel.

2.6.2.3 Visual Assessment Units

The project corridor was divided into a series of “outdoor rooms” or Visual Assessment Units (VAUs). Figure 2.6-1 depicts the three VAUs established for evaluation of the proposed project and the associated key views used to assess potential visual impacts as a result of project implementation. Each VAU has its own visual character and visual quality. For this project, VAUs were defined by particular viewsheds that exhibit similar visual character. The following three VAUs have been identified.

FIGURE 2.6-1

LEGEND

Maximum Disturbance Limits

Photograph Location and Direction

Visual Assessment Units

1

2

3

0 1200 2400

FEET

Bing Maps (c. 2010); TBM (2008); HDR (9/2012)

I:\HDR1102\GIS\ISEA_Key_Views.mxd (4/22/2014)

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Photograph Key Map and Visual Assessment Units

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Visual Assessment Unit 1: Southern

Visual Assessment Unit 1 (VAU1) is located in the southern portion of the project area in the Cities of Irvine and Santa Ana, and along the existing SR-55 right of way. VAU1 is generally defined by areas of the project corridor south of Dyer Road/Barranca Parkway to the southerly project limits at Interstate 405 (I-405). VAU1 is generally flat and consists of the SR-55 corridor, the surrounding existing business park development on the eastern side of SR-55, and a combination of commercial and office (including high-rise), high-rise hotel, and high-rise residential uses on the western side. Visual character within VAU1 can be described as primarily commercial in nature and containing high-rise structures. No prominent natural landforms are visible within VAU1.

Visual Assessment Unit 2: Central

Visual Assessment Unit 2 (VAU2) is located in the central portion of the project area in the Cities of Santa Ana and Tustin. VAU2 is generally defined by areas of the project corridor north of Dyer Road/Barranca Parkway and south of Edinger Avenue. VAU2 is generally flat and consists of the SR-55 corridor and surrounding areas. Visual character within VAU2 can be described as primarily business park and industrial in nature and containing older, concrete tilt-up structures and motels. The Santa Ana Mountains are visible in the distance from some vantage points within VAU2; however, views of the Santa Ana Mountains are frequently masked by atmospheric conditions (e.g., haze).

Visual Assessment Unit 3: Northern

Visual Assessment Unit 3 (VAU3) is located in the northern portion of the project area in the Cities of Tustin and Santa Ana, and along the existing SR-55 right of way. VAU3 is generally defined by areas of the project corridor north of Edinger Avenue to the northerly project limits at Interstate 5 (I-5). VAU3 is generally flat and consists of the SR-55 corridor and surrounding areas. VAU3 is completely surrounded by existing commercial development generally south and southwest of the Santa Fe-Santa Ana Channel (there is also an area of commercial development north of the Santa Fe-Santa Ana Channel and south of McFadden Avenue on the west side of SR-55) and residential uses (at various densities) in areas north of the Santa Fe-Santa Ana Channel on the east side of SR-55 and north of McFadden Avenue on the west side of SR-55. Existing noise barriers obstruct views beyond the project limits on both sides of SR-55, resulting in an urban appearance along this part of the corridor. Visual character within VAU3 can be described as primarily residential in nature but

also contains areas of commercial uses. No prominent natural landforms are visible within VAU3.

2.6.2.4 Key Views

Because it is not feasible to analyze all the views in which the proposed project would be seen, it is necessary to select a number of key views associated with VAUs that would most clearly demonstrate the change in the project's visual resources. Key views also represent the viewer groups that have the highest potential to be affected by the project, considering exposure and sensitivity.

The location and direction for each of the key views are shown previously on Figure 2.6-1. Descriptions of the existing key views are provided below.

Key View 1

Key View 1, located in VAU1, is depicted on Figure 2.6-2. Key View 1 is taken from Cowan Avenue on the east side of SR-55. The view faces north toward SR-55, with the elevated high-occupancy vehicle (HOV) transition lanes and high-rise commercial buildings in the background. Also visible from Key View 1 are a retaining wall, the Cowan Avenue roadway, ornamental vegetation within private property, and utility lines and poles. Key View 1 was chosen to represent a typical view of business patrons and employees in the City of Irvine from the existing business park uses to the east.

Key View 2

Key View 2, located in VAU1, is depicted on Figure 2.6-2. Key View 2 is taken from the SR-55 northbound lanes north of the MacArthur Boulevard interchange. The view faces north, and adjacent business park (right side) and commercial (left side) uses are visible along the project corridor. Also visible from Key View 2 are sparse ornamental vegetation within private property and utility lines and poles. Key View 2 was chosen to represent a typical view of commuters and other regular travelers from within the SR-55 northbound lanes.

KEY VIEW 1: *View facing north toward SR-55 with the elevated HOV lanes and high-rise commercial buildings in the background. The photograph is taken from Cowan on the east side of SR-55. Vegetation is visible on both sides of the photograph and electrical poles and lines are visible on the right side of the photograph.*

KEY VIEW 2: *View facing north along SR-55 from the SR-55 northbound general purpose lanes. Business park and industrial uses are visible on both sides of the freeway, while electrical poles and lines are visible on the right side of the photograph.*

FIGURE 2.6-2

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Key Views 1 and 2

12-ORA-55 PM 6.4/10.3

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Key View 3A

Key View 3A, located in VAU2, is depicted on Figure 2.6-3. Key View 3A is taken from the existing Warner Avenue overcrossing of SR-55. The view depicts the SR-55 mainline and faces south toward I-405, with the high-rise commercial buildings in the background. Also visible within Key View 3A are the adjacent commercial (right side) and business park (left side) uses, ornamental vegetation within private property, and utility lines and poles. Key View 3A provides an elevated vantage point view of SR-55 south of the overcrossing.

Key View 3B

Key View 3B, located in VAU2, is depicted on Figure 2.6-3. Key View 3B, located in VAU2, is taken from the existing Warner Avenue overcrossing of SR-55. The view depicts the SR-55 mainline and faces north toward I-5, with the Santa Ana Mountains in the background. Also visible within Key View 3B are the adjacent commercial (left side) and business park (right side) uses, ornamental vegetation within private property, and utility lines and poles. Key View 3B provides an elevated vantage point view of SR-55 north of the overcrossing.

Key View 4

Key View 4, located in VAU3, is depicted on Figure 2.6-4. Key View 4 is taken from Edinger Avenue on the east side of SR-55, facing northwest toward SR-55. From Key View 5, SR-55 is above grade, consists of embankments that support a bridge structure where Edinger Avenue crosses under SR-55, and obstructs all views beyond the SR-55 structure. Also visible from Key View 4 is a Residence Inn by Marriott hotel, a large billboard, and roadway traffic signals. Key View 4 was chosen to represent a typical view of commuters and other regular travelers in the City of Tustin from the existing commercial/business uses to the east of SR-55.

Key View 5

Key View 5, located in VAU3, is depicted on Figure 2.6-4. Key View 5 is taken from the intersection of Sycamore Avenue and Pasadena Avenue in the vicinity of the McFadden Avenue interchange on SR-55. The view faces west, and the existing SR-55 northbound on- and off-ramps are visible. Also visible within Key View 5 is relatively dense ornamental vegetation within private property and within existing State-owned right of way for SR-55, freeway signage, and utility poles and lines. Key View 5 was chosen to represent a typical view of residents from residential areas along the northern portion of the project corridor.

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KEY VIEW 3A: *View of SR-55 facing south taken from the Warner Avenue overcrossing. Business park and industrial uses are visible on both sides of the freeway, while electrical poles and lines are visible on the left side of the photograph.*

KEY VIEW 3B: *View of SR-55 facing north taken from the Warner Avenue overcrossing. Business park and industrial uses are visible on both sides of SR-55 and the foreground shows electrical lines crossing SR-55. Background views show the Santa Ana Mountains.*

FIGURE 2.6-3

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Key Views 3A and 3B

12-ORA-55 PM 6.4/10.3

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KEY VIEW 4: *View facing northwest toward SR-55 taken from Edinger Avenue on the east side of SR-55. A hotel, vacant land, and a large billboard are visible from this key view.*

KEY VIEW 5: *View facing west from the McFadden Avenue on- and off-ramps on northbound SR-55. The photograph is taken from Sycamore Avenue/Pasadena Avenue. Residential uses are visible from this key view on the left side of the photograph and existing noise barriers are visible on the left and right sides of the photograph.*

FIGURE 2.6-4

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Key Views 4 and 5

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Key View 6

Key View 6, located in VAU3, is depicted on Figure 2.6-5. Key View 6 is taken from the SR-55 southbound lanes at the McFadden Avenue interchange. The view faces south, and adjacent commercial uses (right side) and mature ornamental vegetation (left side) are visible along the project corridor. Also visible within Key View 6 are freeway signage and lighting fixtures associated with SR-55. Key View 6 was chosen to represent a typical view of commuters and other regular travelers from within the SR-55 southbound lanes.

Key View 7

Key View 7, located in VAU3, is depicted on Figure 2.6-5. Key View 7 is taken from the northbound lanes of SR-55 just before the McFadden Avenue overcrossing. The view faces north and depicts vehicles traveling among all lanes along northbound SR-55, including the exclusive HOV lane that ramps up to junction with I-5 to the north. The Santa Ana Mountains are partially visible in the distance from this location although they are often masked by haze. There is minimal ornamental vegetation visible from Key View 7, with the exception of mature trees along the east side of SR-55 behind the existing noise barriers. The majority of adjacent uses are not visible from this key view because the existing noise barriers obstruct most of the view outside the immediate corridor. Some commercial uses are visible on the west side of SR-55 just beyond the McFadden Avenue overcrossing. Other visible features include freeway signage and utility poles and lines. Key View 7 was chosen to represent a typical view of commuters and other regular travelers from within the SR-55 northbound lanes.

2.6.2.5 Visual Character

Visual character includes attributes such as form, line, color, and texture, and is used to describe but not evaluate those attributes. That is, these attributes are considered neither good nor bad. However, a change in visual character can be evaluated when it is compared with the viewer response to that change. Changes in visual character can be identified by how visually compatible a proposed project would be with the existing condition by using visual character attributes as an indicator. For this project, the following attributes were considered:

- **Form:** Visual mass or shape
- **Line:** Edges or linear definition
- **Color:** Reflective brightness (light, dark) and hue (red, green)
- **Texture:** Surface coarseness

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KEY VIEW 6: *View facing south along SR-55 from the SR-55 southbound general purpose lanes. Commercial uses are visible on the west side of SR-55 (right side of the photograph) and residential uses are visible on the east side of SR-55 (left side of the photograph).*

KEY VIEW 7: *View facing north along SR-55 from the SR-55 northbound general purpose lanes just south of the McFadden Avenue overcrossing. An existing noise barrier is visible on the east side of SR-55 (right side of the photograph) and existing business park and commercial buildings intermixed with mature ornamental trees are somewhat visible on the west side of SR-55 (left side of the photograph).*

FIGURE 2.6-5

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Key Views 6 and 7

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- **Dominance:** Position, size, or contrast
- **Scale:** Apparent size as it relates to the surroundings
- **Diversity:** A variety of visual patterns
- **Continuity:** Uninterrupted flow of form, line, color, or textural pattern

The existing visual character within the project corridor is shaped primarily by the existing transportation system, which includes SR-55, its on- and off-ramps, and local roads. The project segment of SR-55 is in a developed urban area. Rail traffic is visible along the BNSF railroad tracks at their crossing of SR-55. The existing buildings in the vicinity of the project segment of SR-55 are typically one or two stories, although some commercial, hotel, and residential structures in the vicinity of the southern part of the project segment of SR-55 in the City of Santa Ana are multi-story, with some exceeding 10 stories in height.

2.6.2.6 Visual Quality

Visual quality is evaluated by identifying the vividness, intactness, and unity present in the project corridor. Public attitudes validate the assessed level of quality and predict how changes to the project corridor can affect these attitudes. This process helps identify specific methods for addressing each visual impact that may occur as a result of the project. The three criteria for evaluating visual quality are defined below:

- Vividness is the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements. For example, views of Niagara Falls would be rated high for vividness.
- Intactness is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions. This factor can be present in well-kept urban and rural landscapes and natural settings. For example, views of a two-lane road that meanders through the countryside would be rated high for intactness.
- Unity is the extent to which all visual elements combine to form a coherent, harmonious visual pattern. For example, views of an English or Japanese garden would be rated high for unity.

None of these descriptive elements is individually equivalent to a specific level of visual quality; all three must be high to substantiate high visual quality. The existing visual quality of the VAUs is summarized in Table 2.6.1. As shown in Table 2.6.1, the existing visual quality ranges from moderately low to moderate.

Table 2.6.1 Visual Quality Summary

	Vividness	Intactness	Unity	Overall Visual Quality
VAU1	Moderately Low	Moderately Low	Moderately Low	Moderately Low
VAU2	Moderately Low	Moderately Low	Moderate	Moderately Low
VAU3	Moderately Low	Moderate	Moderate	Moderate

Source: *Visual Impact Assessment* (2015).
VAU1 = Visual Assessment Unit 1
VAU2 = Visual Assessment Unit 2
VAU3 = Visual Assessment Unit 3

2.6.2.7 Viewer Groups

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

There are two major types of viewer groups for highway projects: highway neighbors and highway users. Highway neighbors are people who have views of the road. For this project, the non-residential and residential highway neighbors were considered. Highway users are people who have views from the road and include northbound and southbound SR-55 travelers and other local travelers.

2.6.2.8 Viewer Response

Viewer response is a measure or prediction of the viewer's reaction to changes in the visual environment. Each viewer group has its own particular level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group that help to predict the groups' responses to visual changes.

Viewer Exposure

Viewer exposure is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: location, quantity, and duration. Location relates to the position of the viewer in relationship to the object being viewed. The closer the viewer is to the object, the more exposure the viewer has to the object. Quantity refers to how many people see the object. The more people who can see an object or the greater the frequency at which an object is seen, the more exposure the object has to viewers. Duration refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the greater its exposure is. High viewer exposure helps predict that viewers will have a response to a visual change.

Viewer Sensitivity

Viewer sensitivity is a measure of the viewer's recognition of a particular object. It has three attributes: activity, awareness, and local values. Activity relates to the preoccupation of viewers (i.e., whether they are preoccupied and thinking of something else or are truly engaged in observing their surroundings). The more viewers are actually observing their surroundings, the more sensitivity they will have to changes in visual resources. Awareness relates to the focus of view (i.e., whether the focus is wide and the view general, or the focus is narrow and the view specific). The more specific the awareness, the more sensitive a viewer is to change. Local values and attitudes also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by local, State, or national designation, it is likely that viewers will be more sensitive to visible changes. High viewer sensitivity helps predict that viewers will have a high concern for any visual change.

Non-residential viewers would have a moderately low level of sensitivity to changes in the visual environment due to their general lack of familiarity with the existing conditions, their frequency of exposure, and their sense of ownership.

Residents are typically highly sensitive to visual changes in proximity to their properties. They develop a sense of ownership, belonging, and familiarity with the existing visual setting. Therefore, residents' sensitivity would rate high even if most of the areas within and adjacent to the project vicinity are not of high visual quality.

Commuters and other regular travelers on SR-55 would be susceptible to visual changes because of their familiarity with the existing visual conditions. Similar to area residents, daily commuters and other regular travelers develop familiarity with the existing surrounding areas and therefore would respond more strongly to changes than infrequent travelers. Infrequent travelers are not familiar with the sights and thus are not susceptible to physical changes in surroundings; therefore, their sensitivity to change is considered low.

Local roadway travelers consist of motorists, bicyclists, and pedestrians. Their sensitivity to change is considered low.

Overall Viewer Response

The narrative descriptions of viewer exposure and viewer sensitivity for each viewer group were merged to establish the overall viewer response of each group.

Viewer exposure for the four viewer groups is summarized in Table 2.6.2.

Table 2.6.2 Viewer Response Summary

Viewer Group	Viewer Exposure	Viewer Sensitivity	Viewer Response
Non-Residential	Moderate	Moderately Low to Moderate	Moderate
Residential	Moderately Low	Moderate	Moderate
SR-55 Travelers	Moderately High	Moderate	Moderate
Other Local Travelers	Moderate	Moderately Low	Moderately Low

Source: *Visual Impact Assessment* (2015).
SR-55 = State Route 55

2.6.3 Environmental Consequences

2.6.3.1 Temporary Impacts

Build Alternatives

Construction of any of the SR-55 Build Alternatives would result in temporary visual changes as a result of removing vegetation, grading, other construction activities, and views of construction equipment, staging areas, temporary construction easements (TCEs), and stockpiling of materials. The Build Alternatives would require TCEs that would be visible from key views; however, the visual effects of the TCEs would be temporary, and no loss of scenic resources would occur. The areas of vegetation do not substantially contribute to the overall visual character and quality of key views, are partially masked, and do not reduce the overall vividness, unity, and intactness of views. After construction is completed, these temporary impacts would no longer occur. Because construction impacts are temporary and disturbed areas would be revegetated upon completion of construction, no permanent change in visual character and quality would occur. The potential visual impacts during construction of the Build Alternatives would not be adverse.

No Build Alternative

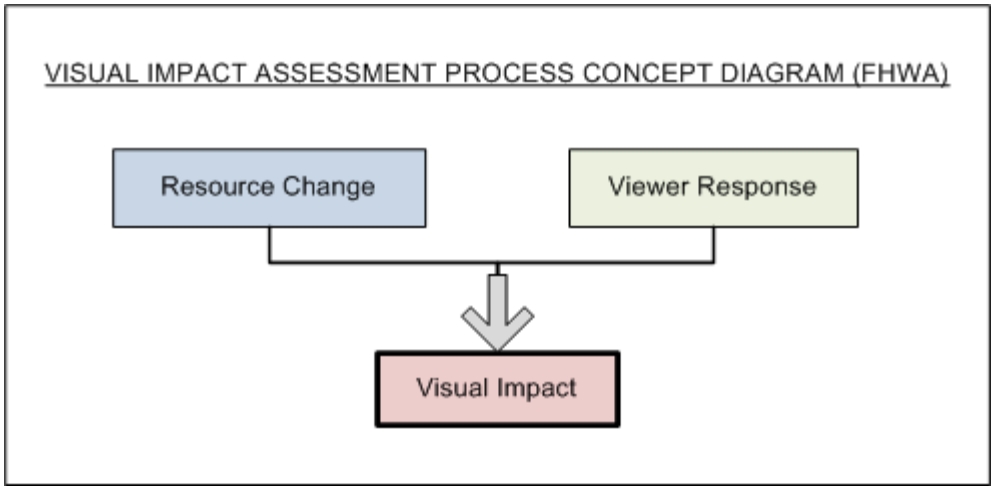
The No Build Alternative would not include the construction of any of the project improvements on SR-55 and, therefore, would not result in changes in views to/from the project segment of SR-55. Therefore, the No Build Alternative would not result in short-term visual impacts on and in the vicinity of the project segment of SR-55.

2.6.3.2 Permanent Impacts

Visual Impact Methodology

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental. Cumulative impacts and temporary impacts due to the contractor's

operations are also considered. A generalized visual impact assessment process is illustrated in the following diagram.



Source: *Visual Impact Assessment* (2015).

In the diagram above and in the matrix below, note how ***Resource Change*** (i.e., the visual character and visual quality of the visual resources in the project corridor before and after the construction of the proposed project), ***Viewer Response*** (i.e., a measure or prediction of the viewer's reaction to changes in the visual environment that has two dimensions: viewer exposure and viewer sensitivity), and the resulting ***Visual Impact*** (i.e., the correlation between the level of Resource Change and the anticipated Viewer Response) are color-coded to assist the reader in identifying how Visual Impact is determined in this analysis. For example, as shown in bold outline in the following matrix, where Resource Change has been identified as Low and the anticipated Viewer Response is Low, the resulting Visual Impact is Low.

Resource Change	Viewer Response				
	Low	**Moderately Low**	**Moderate**	**Moderately High**	**High**
Low	L	ML	ML	M	M
Moderately Low	ML	ML	M	M	MH
Moderate	ML	M	M	MH	MH
Moderately High	M	M	MH	MH	H
High	M	MH	MH	H	H

Source: *Visual Impact Assessment* (2015).
H = High
L = Low
M = Moderate
MH = Moderately High
ML = Moderately Low

Table 2.6.3 summarizes and compares the narrative ratings for visual resource change and viewer response among Alternatives 1 through 4 for each key view. The following section describes and illustrates visual impacts by VAU, compares existing conditions to the proposed alternatives, and includes the predicted viewer response.

Alternative 1

Visual Assessment Unit 1: Southern

Implementation of Alternative 1 would result in additional hardscape surfaces (i.e., additional travel lanes and a new noise barrier) within VAU1; however, the visual character and quality of the project corridor would appear similar to existing conditions. Some loss of existing vegetation would occur with implementation of Alternative 1; however, the existing vegetation within VAU1 does not substantially contribute to the overall visual character and quality of the views within VAU1. A majority of the existing vegetation within VAU1 will remain in place. No existing views of scenic resources from within VAU1 would be obstructed. A new 12 ft high noise barrier is proposed adjacent to the pool area of the Double Tree by Hilton hotel located west of SR-55. It should be noted that many of the buildings in this area of the project segment of SR-55 are multi-story, and some exceed 10 stories in height. Furthermore, the proposed noise barrier is located within private property and would not obstruct existing public views. Additionally, installation of noise barriers at this location would not obstruct views of the existing high-rise commercial and hotel uses when viewed from the SR-55 facility. The overall visual resource change in VAU1 as a result of Alternative 1 is expected to be moderately low. Viewers within VAU1 consist of nonresidential viewers, commuters, other regular travelers, and other local travelers. While change would be noticeable to these viewers as a result of a slight widening of SR-55 from Key Views 1 and 2, the resulting condition would appear similar to the existing condition. In consideration of the anticipated resource change in VAU1 and the anticipated group viewer response, the overall visual impact within VAU1 under Alternative 1 is considered to be moderate.

Visual Assessment Unit 2: Central

Implementation of Alternative 1 would result in additional hardscape surfaces (i.e., additional travel lanes) within VAU2; however, the visual character and quality of the project corridor would appear similar to existing conditions. Some loss of existing vegetation would occur with implementation of Alternative 1 due to the proposed widening; however, large expanses of turf or mature trees would not remain. The existing vegetation within VAU2 contributes to the overall visual character and quality of the views within VAU2, and the majority of the existing

Table 2.6.3 Narrative Ratings for Each Key View

Visual Assessment Unit	Key View	Alternative 1			Alternative 2			Alternative 3			Alternative 4		
		Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
VAU1 Southern	1	L	ML	ML	ML	ML	ML	ML	ML	ML	L	ML	ML
	2	ML	M	M	ML	M	M	ML	M	M	ML	M	M
VAU2 Central	3A	ML	M	M	ML	M	M	ML	M	M	ML	M	M
	3B	ML	M	M	ML	M	M	ML	M	M	ML	M	M
VAU3 Northern	4	L	ML	ML	ML	ML	ML	ML	ML	ML	L	ML	ML
	5	ML	M	M	ML	M	M	ML	M	M	ML	M	M
	6	ML	M	M	ML	M	M	ML	M	M	ML	M	M
	7	L	M	ML	L	M	ML	M	M	M	M	M	M

Source: *Visual Impact Assessment* (2015).
L = Low
M = Moderate
ML = Moderate-Low
VAU1 = Visual Assessment Unit 1
VAU2 = Visual Assessment Unit 2
VAU3 = Visual Assessment Unit 3

vegetation within VAU2 will remain in place. No existing views of scenic resources from within VAU2 would be obstructed. No new noise barriers are proposed within VAU2. The overall visual resource change in VAU2 as a result of Alternative 1 is expected to be moderately low. Viewers within VAU2 consist of commuters, other regular travelers, and other local travelers. While change would be noticeable to these viewers from Key Views 3A and 3B as a result of widening SR-55, the resulting condition would appear similar to the existing condition. In consideration of the anticipated resource change in VAU2 and the anticipated group viewer response, the overall visual impact in VAU2 under Alternative 1 is considered to be moderate.

The view simulations of Alternative 2 at Key Views 3A and 3B (which are provided on Figures 2.6-6 and 2.6-7, respectively) can also be used to illustrate the improvements proposed in Alternative 1. The difference is the designation of the lane along northbound SR-55 (i.e., Alternative 1 proposes an auxiliary lane while Alternative 2 proposes a general-purpose lane). Both alternatives would result in a total of 6 lanes in each direction (12 lanes total).

Visual Assessment Unit 3: Northern

Implementation of Alternative 1 would result in additional hardscape surfaces (i.e., additional travel lanes, bridge widening, and potentially increased noise barrier height) in VAU3; however, the visual character and quality of the project corridor would appear similar to existing conditions. Some loss of existing vegetation would occur with implementation of Alternative 1 due to the proposed widening; however, large expanses of turf or mature trees would not be removed. The existing vegetation within VAU3 does not contribute to the overall visual character and quality of the views within VAU3, and the majority of the existing vegetation in VAU3 will remain in place. No existing views of scenic resources in VAU3 would be obstructed. The overall visual resource change in VAU3 as a result of Alternative 1 is expected to be moderate. Viewers in VAU3 consist of residential viewers, non-residential viewers, commuters, other regular travelers, and other local travelers. While change would be noticeable to these viewers from Key Views 4, 5, 6, and 7 as a result of widening SR-55, the resulting condition would appear similar to the existing condition. In consideration of the anticipated resource change in VAU3 and the anticipated group viewer response, the overall visual impact in VAU3 under Alternative 1 is considered to be moderately low.

Existing Condition

Alternative 2 Improvements

FIGURE 2.6-6

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Visual Simulation for Key View 3A - Alternative 2

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Existing Condition

Alternative 2 Improvements

FIGURE 2.6-7

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Visual Simulation for Key View 3B - Alternative 2

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Alternative 2

Visual Assessment Unit 1: Southern

Improvements under Alternative 2 are similar to the improvements proposed for Alternative 1 but do not include the proposed auxiliary lane between the MacArthur Boulevard and Dyer Road interchange proposed under Alternative 1. This difference would result in a slightly greater hardscape surface area as viewed from Key View 1 but would appear the same as that viewed from Key View 2. Similarly, some loss of existing vegetation would occur with implementation of Alternative 2. However, the existing vegetation within VAU1 does not substantially contribute to the overall visual character and quality of the views within VAU1. A majority of the existing vegetation within VAU1 will remain in place. Other changes to existing resources would be similar to those described above for Alternative 1 within VAU1. The overall visual resource change in VAU1 as a result of Alternative 2 is expected to be moderately low. While change would be noticeable to these viewers as a result of a slight widening of SR-55 from Key View 1, the resulting condition would appear similar to the existing condition. In consideration of the anticipated resource change in VAU1 and the anticipated group viewer response, the overall visual impact within VAU1 under Alternative 1 is considered to be moderate.

Visual Assessment Unit 2: Central

Figures 2.6-6 and 2.6-7 present comparisons of Key Views 3A and 3B in the existing condition and the proposed changes of Alternative 2. The proposed widening occurring under Alternative 2 would be identical in width to the proposed widening under Alternative 1 within VAU2. Utility relocations would occur under Alternative 2 in VAU2, thereby reducing the amount of intervening man-made features. The same narrative ratings identified for Alternative 1 in VAU2 would apply for Alternative 2 in VAU2. Therefore, in consideration of the anticipated resource change in VAU2 and the anticipated group viewer response, the overall visual impact in VAU2 under Alternative 2 is considered to be moderate.

Visual Assessment Unit 3: Northern

The proposed widening occurring under Alternative 2 would be greater in width when compared to Alternative 1 and would result in a greater amount of new hardscape surface (i.e., additional travel lanes, bridge widening, and potentially increased noise barrier height) within VAU3. However, the same narrative ratings identified for Alternative 1 in VAU3 would apply for Alternative 2 in VAU3, with the exception of Key View 4 because no resources are identified at that location. Therefore, in consideration of the anticipated resource change in VAU3 and the anticipated group

viewer response, the overall visual impact in VAU3 under Alternative 2 is considered to be moderate.

Alternative 3

Visual Assessment Unit 1: Southern

Implementation of Alternative 3 would result in a slightly greater hardscape surface area as viewed from Key View 1 (when compared to Alternative 1, but not Alternative 2) and as viewed from Key View 2 (when compared to Alternative 2, but not Alternative 1) within VAU1. Similarly, some loss of existing vegetation would occur with implementation of Alternative 3; however, the existing vegetation within VAU1 does not substantially contribute to the overall visual character and quality of the views within VAU1. A majority of the existing vegetation within VAU1 will remain in place. Other changes to existing resources would be similar to those described above for Alternatives 1 and 2. The same narrative ratings identified for Alternative 2 would apply to Alternative 3; therefore, the overall visual impact within VAU1 under Alternative 3 is considered to be moderate.

Visual Assessment Unit 2: Central

Figures 2.6-8 and 2.6-9 present comparisons of Key Views 3A and 3B, respectively, in the existing condition and the proposed changes as a result of the improvements in Alternative 3. Implementation of Alternative 3 would result in a slightly greater surface hardscape area and vegetation removal compared to Alternative 2. The proposed widening occurring under Alternative 3 would be slightly wider than the proposed widening under Alternative 2 within VAU2. Utility relocations would occur under Alternative 2 in VAU2, thereby reducing the amount of intervening man-made features. The same narrative ratings identified for Alternative 2 in VAU2 would apply for Alternative 3 in VAU2. Therefore, in consideration of the anticipated resource change in VAU2 and the anticipated group viewer response, the overall visual impact in VAU2 under Alternative 3 is considered to be moderate.

Visual Assessment Unit 3: Northern

Figures 2.6-10 and 2.6-11 present a comparison of Key Views 5 and 7 in the existing condition and the proposed changes under Alternative 3. The restriping proposed under Alternative 3 does not require any additional surface area to implement and would only require painting of a solid white stripe separating the SR-55 northbound lanes from the I-5 connector lanes. The proposed widening occurring under Alternative 3 would be identical to that proposed under Alternative 2 within VAU3.

Existing Condition

Alternative 3 Improvements

FIGURE 2.6-8

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Visual Simulation for Key View 3A - Alternative 3

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Existing Condition

Alternative 3 Improvements

FIGURE 2.6-9

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Visual Simulation for Key View 3B - Alternative 3

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Existing Condition

Alternative 3 Improvements

FIGURE 2.6-10

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Visual Simulation for Key View 5 - Alternative 3

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Existing Condition

Alternative 3 Improvements

FIGURE 2.6-11

State Route 55 (SR-55) Improvement Project between Interstate 405 (I-405) and Interstate 5 (I-5)

Visual Simulation for Key View 7 - Alternative 3

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The same narrative ratings identified for Alternative 2 in VAU3 would apply for Alternative 3 in VAU3. Therefore, in consideration of the anticipated resource change in VAU3 and the anticipated group viewer response, the overall visual impact in VAU3 under Alternative 3 is considered to be moderate.

Alternative 4

Visual Assessment Unit 1: Southern

Implementation of Alternative 4 would be similar to Alternative 1 within VAU1; however, Alternative 4 includes the addition of northbound and southbound HOV lanes. Some loss of existing vegetation would occur with implementation of Alternative 4; however, the existing vegetation within VAU1 does not substantially contribute to the overall visual character and quality of the views within VAU1. A majority of the existing vegetation within VAU1 will remain in place. Other changes to existing resources would be similar to those described above for Alternative 1 within VAU1. The overall visual resource change in VAU1 as a result of Alternative 4 is expected to be moderately low. While change would be noticeable to these viewers from Key View 2 as a result of widening SR-55, the resulting condition would appear similar to the existing condition. In consideration of the anticipated resource change in VAU1 and the anticipated group viewer response, the overall visual impact in VAU1 under Alternative 1 is considered to be moderate.

Visual Assessment Unit 2: Central

The proposed widening occurring under Alternative 4 would be identical in width to the proposed widening under Alternative 3 within VAU2. The same narrative ratings identified for Alternative 3 in VAU2 would apply for Alternative 4 in VAU2. Therefore, in consideration of the anticipated resource change in VAU2 and the anticipated group viewer response, the overall visual impact in VAU2 under Alternative 4 is considered to be moderate.

The proposed improvements envisioned under Alternative 4 at Key Views 3A and 3B are very similar to that depicted for Alternative 3, except for the designation of lanes. Therefore the view simulation of Alternative 3 at Key View 3A provided earlier in Figures 2.6-8 and 2.6-9 can also be used to illustrate the improvements proposed in Alternative 4. The difference is that Alternative 3 proposes 2 general-purpose lanes and 2 auxiliary lanes (one in each direction) that would be visible at this location, for a total of 7 lanes in each direction (14 lanes total), and Alternative 4 proposes 1 new HOV lane in each direction plus an auxiliary lane in the northbound direction and an

additional general-purpose lane in the southbound direction, for a total of 7 lanes in each direction (14 lanes total).

Visual Assessment Unit 3: Northern

The proposed widening occurring under Alternative 4 would be slightly reduced in width compared to the proposed widening under Alternative 3 within VAU3. However, the proposed improvements envisioned under Alternative 4 at Key Views 5 and 7 are identical to those depicted for Alternative 3 on Figures 2.6-10 and 2.6-11. In addition, the same narrative ratings identified for Alternative 3 in VAU3 would apply for Alternative 4 in VAU3, with the exception of Key View 4 because no resources are identified at that location. Therefore, in consideration of the anticipated resource change in VAU3 and the anticipated group viewer response, the overall visual impact in VAU3 under Alternative 4 is considered to be moderate.

No Build Alternative

The No Build Alternative would not include the construction of any of the project improvements on SR-55 and, therefore, would not result in changes in views to/from the project segment of SR-55. Therefore, the No Build Alternative would not result in long-term visual impacts on and in the vicinity of the project segment of SR-55.

2.6.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures would minimize the potential visual impacts of the Build Alternatives:

VIS-1 Architectural treatments and features will be included in the final project design to minimize the loss of, and improve the visual quality on, the project segment of State Route 55 (SR-55). The architectural treatments will be developed for retaining walls and noise barriers consistent with the *Master Plan of Freeway and Transit Corridor Enhancements: Creating a Quality Environment along Orange County's Transportation Network*.

All wall architectural treatments will be submitted to the California Department of Transportation (Caltrans) District Landscape Architect for review and approval.

During construction, the construction contractor will implement the architectural treatments as shown in the project specifications.

VIS-2 During final design, a landscape architect will prepare a Landscape Plan to address landscape treatment within the State right of way (ROW) along the project segment of SR-55. The Landscape Plan will include, but not be limited to, the following:

- Identifying/defining the minimum standards for providing landscaping: available land, no conflicts with traffic operations and safety, safe access for maintenance and trash removal, and access to irrigation and water if needed.
- Identifying landscaping and hardscape concepts and materials to maintain or improve the visual character of the existing landscaping in the SR-55 ROW from south of Interstate 5 (I-5) to north of Interstate 405 (I-405), including the mainline, ramps, and along noise barriers and retaining walls. The hardscape concepts and materials shall be consistent with the *Master Plan of Freeway and Transit Corridor Enhancements: Creating a Quality Environment along Orange County's Transportation Network*.
- Incorporating applicable procedures and requirements in the Caltrans *Highway Design Manual*, Section 902.1, Planting Guidelines (November 2001 or newer).
- Using drought-resistant plants and xeric (adapted to arid conditions) landscaping techniques.
- Providing low-maintenance, erosion-control groundcover species and low-height shrubs in the palette to preserve existing views and prevent erosion.
- Providing landscaping as soon as possible in the construction process to minimize bare soil and potential erosion effects.
- Ensuring that the landscape plant palette conforms with adopted Caltrans standard specifications.
- Replacing landscaping on parcels used for temporary construction easements (TCEs). The Landscape Plan will require coordination with the owner of each TCE regarding replacement of landscaping removed from the property as part of the project construction activities and replacement of that landscaping to its original or better condition after completion of the construction activities requiring the use of that land for TCEs.

- The Landscape Plan will be submitted to the Caltrans District Landscape Architect for review and approval.
- During construction, the construction contractor will implement the provisions of the approved Landscape Plan as shown in the project specifications.

2.7 Cultural Resources

2.7.1 Regulatory Setting

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

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, the Federal Highway Administration (FHWA), State Historic Preservation Officer (SHPO), and the California Department of Transportation (Caltrans) went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA (amended January 2014), implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as CA Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the National Register of Historic Places listing criteria. It further specifically requires Caltrans 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 summarizes information from *Historic Property Survey Report* (HPSR; 2015).

2.7.2.1 Methodology

The methodology to identify previously documented cultural resources included:

- Consultation with a number of Native American Tribes (groups and individuals) in compliance with Section 106 of the NHPA and Assembly Bill 52 (AB 52).
- Consultation with the Native American Heritage Commission (NAHC).
- Communication with the Orange County Historical Society, Santa Ana Historic Preservation Society, Irvine Historical Society, and the Tustin Area Historical Society.
- Records search at the South Central Coastal Information Center (SCCIC), California State University, Fullerton, which included review of the National Register of Historic Places (National Register); California Register of Historical Resources (California Register); California Inventory of Historical Resources; California Historical Landmarks; California Points of Historical Interest; State Historic Resources Commission; California Historic Highway Bridge Inventory; and archaeological site records search. Based on the records search, no archaeological sites are recorded within the Area of Potential Effects (APE).
- Other sources consulted included the Cities of Santa Ana, Irvine, and Tustin; historic aerial photographs; United States Geological Survey (USGS) maps; and the Caltrans Structure, Maintenance & Investigations, Historic Significance – State Agency Bridges.

A reconnaissance-level field survey of the Area of Potential Effects (APE) was conducted on May 11, 2012. During that survey, the buildings in the APE were observed and notations regarding their apparent age and integrity were made. Based on that survey and basic property-specific research, the majority of buildings and a short segment of the BNSF Railway in the APE were determined to meet the criteria for classification under Property Types 2–4 and 6 in the Caltrans Section 106 PA, and did not require further documentation. Most of the buildings found to be exempt are modern or significantly altered. An intensive field survey of the remaining buildings was conducted on October 4, 2012, and January 15, 2013. During those surveys, the buildings were photographed and detailed notations were made of the structural and architectural characteristics, current conditions, settings, and associated features of each building.

On June 5, June 6, and July 18, 2012, a survey of the APE for archaeological resources was conducted. The APE is in an urban environment and has been extensively disturbed by prior land uses. Ground visibility is generally limited to areas of introduced, recontoured fill. The areas that could be systematically surveyed consisted of the undeveloped parcels adjacent to the east side of State Route 55 (SR-55) between Edinger Avenue and Valencia Avenue, undeveloped parcels on the west side of SR-55 adjacent to Grand Avenue, and an undeveloped parcel on the west side of SR-55 west of Alton Parkway. Nonetheless, very little area that could potentially contain intact, native sediments was identified during the field survey. The parcels adjacent to the east side of SR-55 between Edinger Avenue and Valencia Avenue were covered with extensive artificial fill. Two hotels were constructed on the previously vacant parcel on the east side of SR-55 just south of Edinger Avenue. Parcels on the west side of SR-55 adjacent to Grand Avenue were almost completely covered in a thick layer of mulch, with ground visibility limited to areas near Southern California Edison (SCE) power lines. The remainder of the APE was examined where there was visible ground that could potentially be native soil. These areas included road shoulders and parts of the SR-55 right-of-way that are at or near original grade and contained soil rather than artificial fill.

A supplemental records search was conducted at the SCCIC on February 11, 2014, when the APE was expanded to include the Interstate 5 (I-5)/Newport Avenue and I-5/Redhill Avenue interchanges. That supplemental records search only included the I-5/Newport Avenue interchange because no ground disturbance is proposed at the I-5/Redhill Avenue interchange. No archaeological sites are recorded within the expanded APE based on the supplemental records search.

2.7.2.2 Results

Based on the records searches, consultation/communication, and field surveys described above, no archaeological sites have been recorded within the project APE. A total of 17 built environment resources that have been recorded within the project APE were evaluated and determined not to be eligible for the National Register.

Eleven State agency bridges are within the APE. All these bridges are listed in the California Historical Significance State Agency Bridge List of April 2012 as Category 5 Bridges and are not eligible for the National Register. Therefore, the bridges are not subject to evaluation per the Caltrans Section 106 PA, nor do they meet any criteria outlined in Section 15064.5(a) of the CEQA Guidelines.

Caltrans has determined that all the State-owned resources (built environment and archaeological resources) in the project APE are exempt from evaluation because they meet the criteria set forth in Section 106 PA Attachment 4 (Properties Exempt from Evaluation) or were previously determined not eligible for inclusion in the National Register and/or registration as a California Historical Landmark, and that determination is still valid.

2.7.2.3 Discoveries During Construction

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.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner shall be contacted. Pursuant to California PRC Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC, who will then notify the Most Likely Descendant (MLD). At this time, the person who discovered the remains will contact the Caltrans Resident Engineer, who will then contact the Caltrans District Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of California PRC 5097.98 are to be followed as applicable.

2.7.3 Environmental Consequences

2.7.3.1 Archaeological and Historical Resources

Because there are no documented archaeological or historical resources in the project APE, the construction and operation of the Build Alternatives would not temporarily or permanently impact archaeological or historical resources, and a finding of No Historic Properties Affected is appropriate for the proposed project.

2.7.3.2 Previously Undocumented Cultural Materials and Section 4(f)

There is potential for previously undocumented cultural materials or human remains to be unearthed during site preparation, grading, or excavation for the Build Alternatives. Those potential effects would be substantially minimized based on implementation of Measures CR-1 and CR-2 described in the following section.

As noted earlier, the study area for National Register listed and eligible resources was defined as the APE delineated in the *Historic Property Survey Report* (HPSR). The HPSR determined there are no National Register listed or eligible cultural resources

in the APE for the proposed project. Therefore, there are no National Register listed or eligible cultural resources that would trigger the requirements for protection under Section 4(f), and no further discussion of those types of resources is provided relative to the requirements of Section 4(f).

2.7.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures avoid and/or minimize potential project effects to cultural materials or human remains, if any, discovered during construction of the Build Alternatives.

CR-1 **Discovery of Cultural Materials.** If cultural materials are discovered during site preparation, grading, or excavation, the construction contractor will divert all earthmoving activity within and around the immediate discovery area until a qualified archaeologist can assess the nature and significance of the find. At that time, the Caltrans District 12 Environmental Chief Branch or the District 12 Native American Coordinator will be coordinated with to determine appropriate course of action.

CR-2 **Discovery of Human Remains.** If human remains are discovered during site preparation, grading, or excavation, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and that the County Coroner shall be contacted. Pursuant to California 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, which will then notify the Most Likely Descendant (MLD). At that time, the Caltrans District 12 Environmental Branch Chief or the District 12 Native American Coordinator will be contacted so they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of California PRC 5097.98 are to be followed as applicable.

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