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

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

- **Coastal Zone:** There is no potential for substantial impacts to the coastal zone because the Project site is approximately 50 miles inland from the coast.
- **Wild and Scenic Rivers:** There is no potential for substantial impacts to wild and scenic rivers due to the absence of designated wild and scenic rivers in the vicinity of the Project site.
- **Farmlands or Timberlands:** There is no potential for substantial impacts to farmlands or timberlands. The Project site is in the City of Grand Terrace and the City of Colton, and no timberlands are present. There are no farmlands in the Project area.
- **Floodplains:** According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 06071C8687H (August 28, 2008), there are no 100-year floodplains within the Project area.

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HUMAN ENVIRONMENT

2.1 Land Use

This section is based on information from the *Community Impact Assessment* (CIA) (November 2013). The study area for land use analysis is the portion of the City of Grand Terrace and the City of Colton within and surrounding the Project area. For this Project, the study area includes the neighborhoods located within and adjacent to the Project design footprint. Community Profile data are collected and organized by city, county, and census tract; therefore, these boundaries are utilized in conjunction with evaluating impacts to the affected environment within the study area.

2.1.1 Existing and Future Land Use

2.1.1.1 Existing Land Use

The study area is located primarily in the City of Grand Terrace, with a small portion in the City of Colton in San Bernardino County. The Cities of Grand Terrace and Colton were incorporated in 1978 and 1887, respectively. Existing land use in the study area in the City of Grand Terrace and the City of Colton south of the Interstate 215 (I-215)/Mt. Vernon Avenue-Washington Street interchange to the cities' southern boundaries is shown in Figure 2.1.1 and is described below by quadrants that represent the intersection of I-215 with Barton Road. Within the Project area, existing land use was mapped based on field surveys. Existing land use outside of the Project area is based on aerial photographs and geographic information system (GIS) data provided by the Southern California Association of Governments (SCAG; 2008). The data was compiled into general land use designations.

Northeast Quadrant

This quadrant is within the City of Grand Terrace. Existing land uses include Grand Terrace Elementary School, a few small businesses, and single-family residential properties.

Northwest Quadrant

This quadrant is primarily within the City of Grand Terrace, with a small portion within the City of Colton. The current land uses in the northwest quadrant consist of a few single-family residences, a recreational vehicle (RV) park (Terrace Village RV Park), two mobile home parks (Grand Terrace Mobile Home Park and Grand Royal Mobile Estates), two strip malls, a restaurant (Demetri's Burgers), and an office complex.

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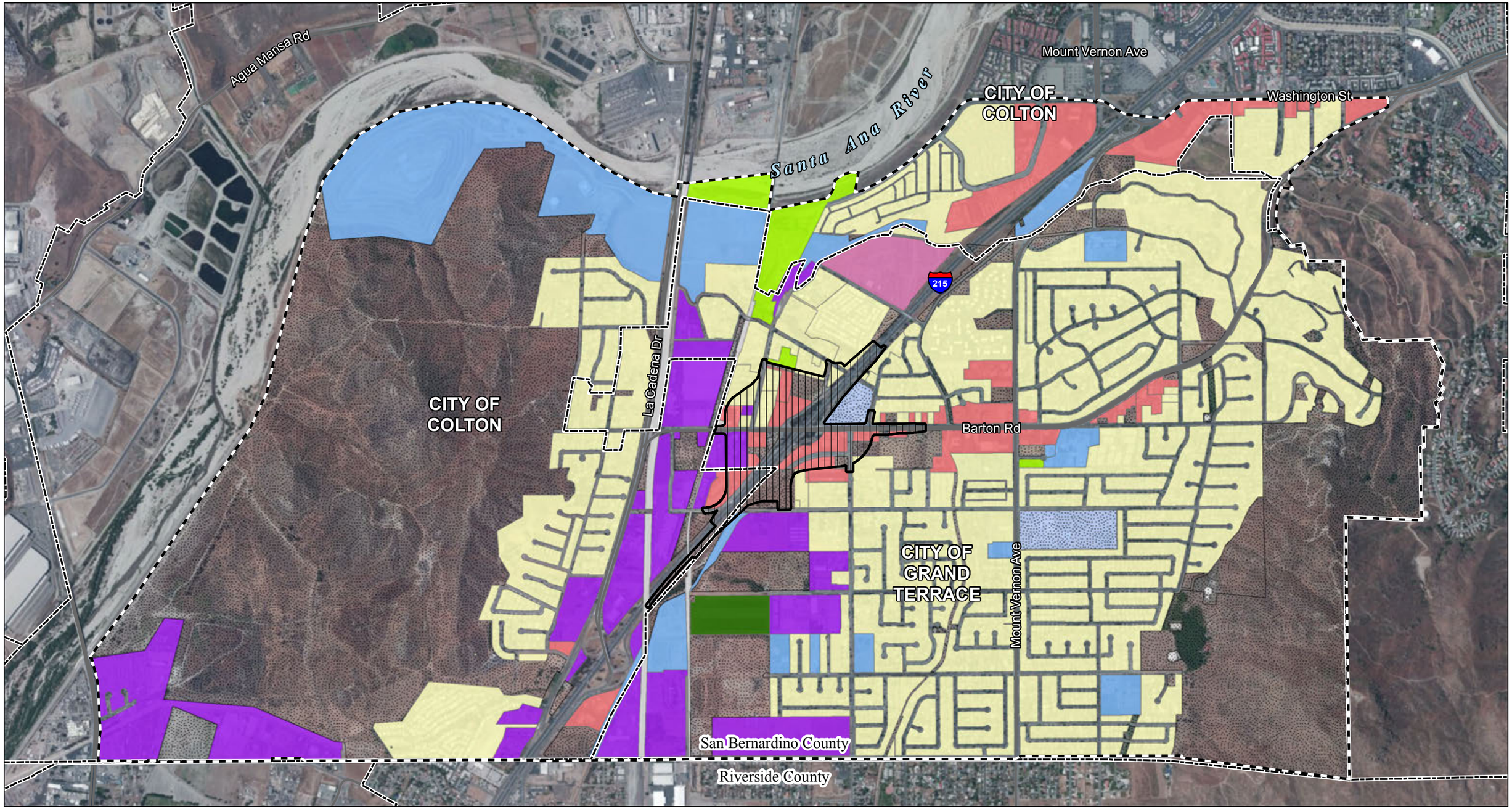

LEGEND

- Land Use Study Area
- Project Area
- City Boundaries

Existing Land Use

- Agriculture
- Residential
- Commercial
- Communication & Utility Facilities
- Industrial
- Public Facilities
- Education
- Open Space and Recreation
- Railroad
- Vacant

N

0 750 1500
FEET

SOURCE: Microsoft (5/2010); SCAG (2008); LSA (9/2013)

I:\SBA330\Barton_I-215\GIS\ISEA\Existing_LandUse.mxd (10/22/2013)

FIGURE 2.1.1

I-215/Barton Road Interchange Improvement Project

Study Area Existing Land Use

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Southwest Quadrant

This quadrant is primarily within the City of Colton. A small portion is within the City of Grand Terrace, and a small portion is unincorporated. Existing land uses in this quadrant include small businesses, bus storage, industrial businesses, office buildings, and retail stores.

Southeast Quadrant

This quadrant is within the City of Grand Terrace. Existing land uses include two gasoline stations, (Shell and Arco), retail stores, an auto repair facility (GT Pit Stop), industrial warehouses, and a few vacant parcels.

2.1.1.2 Future Land Use

According to the City of Grand Terrace General Plan Land Use Element, approximately 5.4 percent of its land uses are designated for commercial, 6.4 percent for industrial, 4.2 percent for mixed-use, 8 percent for open space, 22 percent for public/streets, and 54 percent for residential uses. The City of Colton General Plan Land Use Element does not include percentages of land designated for specific uses.

The Land Use Elements in the General Plans for the Cities of Grand Terrace (April 2010) and Colton (2013) identify the future planned land uses in the Cities. General Plan land uses for the Cities of Grand Terrace and Colton within the Project area are shown in Figure 2.1.2. General Plan land use data is based on hard copy maps published by the Cities of Grand Terrace (April 2010) and Colton (May 2012), as well as GIS data provided by SCAG as part of the 2008 Regional Transportation Plan (RTP). No GIS data is available from the adopted 2012–2035 RTP/Sustainable Communities Strategy (SCS). The data was compiled into general land use designations. The General Plan land uses in the Project area are described below by quadrant.

Northeast Quadrant

Located in the City of Grand Terrace, this quadrant is designated as Public, General Commercial (GC), and Low- and Medium-Density Residential under the City General Plan. The Public designation includes public facilities such as schools, parks, City Hall, City maintenance facilities, and facilities owned and operated by public utilities. The GC designation provides for general commercial uses to serve the retail and service needs of the community. The Low-Density Residential designation limits land uses to single-family detached residential units and mobile homes.

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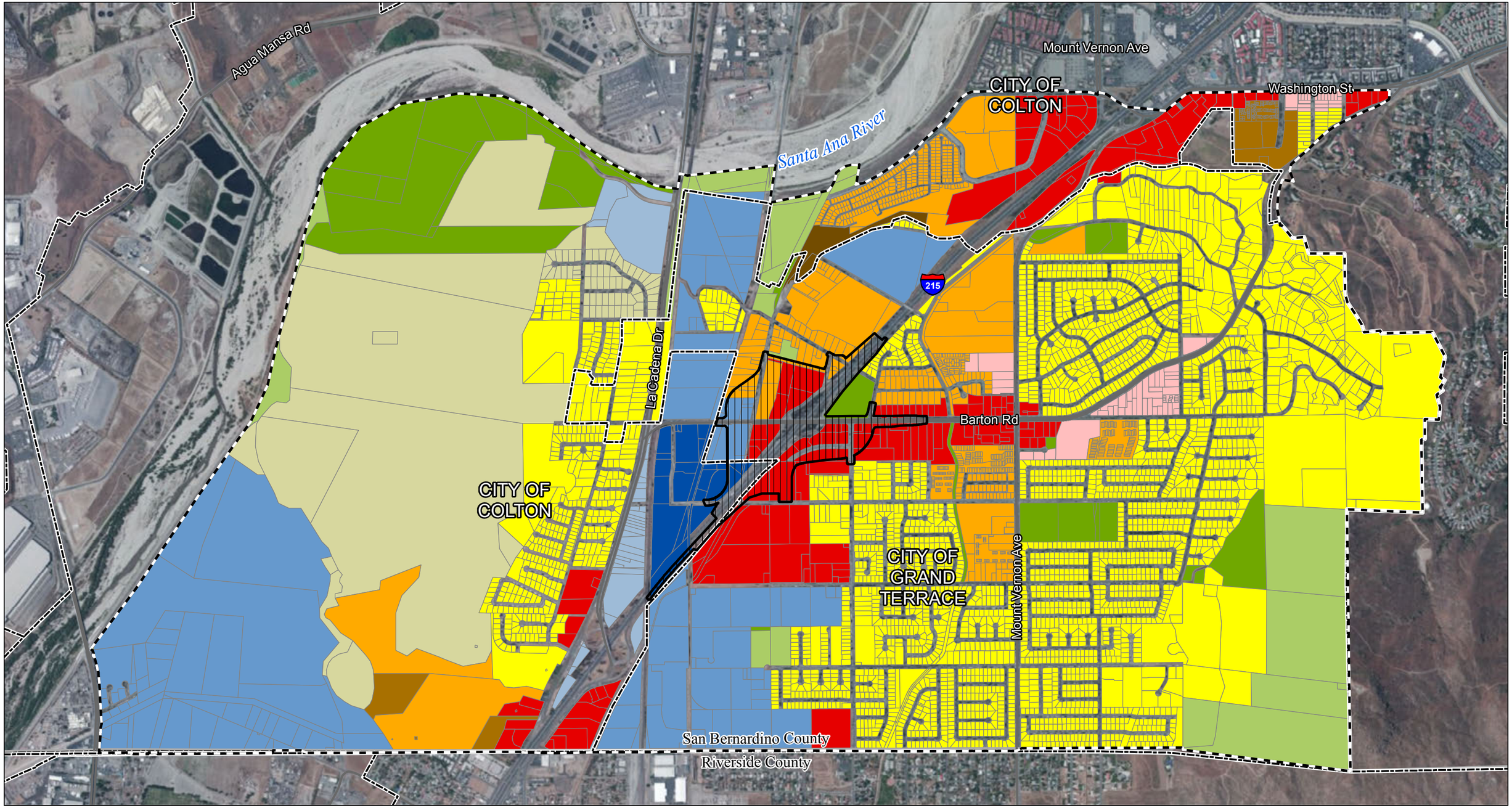

LEGEND

- Land Use Study Area
- Project Area
- City Boundaries

General Plan Land Use

- Residential Estates
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Commercial Office
- General Commercial
- Industrial Park
- Light Industrial
- Heavy Industrial
- Open Space
- Public Facility
- Planned Community

N

0 750 1500
FEET

SOURCE: Microsoft (5/2010); SCAG (2008); City of Grand Terrace (2010); City of Colton (2009, 2012)

I:\SBA330\Barton_I-215\GIS\ISEA\GeneralPlan_LandUse.mxd (10/16/2013)

FIGURE 2.1.2

I-215/Barton Road Interchange Improvement Project

Study Area General Plan Land Use

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Northwest Quadrant

Also located in the City of Grand Terrace, this quadrant is designated as GC, Medium-Density Residential, and Industrial uses. Medium-Family Residential uses allow for both single-family detached and multifamily attached developments, including condominiums and apartment complexes. Industrial uses allow for manufacturing and assembly, small-scale warehousing and distribution businesses, research and development, and administrative and service types of uses.

Southwest Quadrant

This quadrant is in the Cities of Grand Terrace and Colton and is designated as GC and Industrial uses.

Southeast Quadrant

This quadrant is entirely in the City of Grand Terrace and is designated for GC Low-Density Residential uses.

2.1.1.3 Development Trends

The City of Grand Terrace was incorporated in 1978. The development of predominantly commercial and industrial uses in the City of Colton resulted in the development of the City of Grand Terrace as a residential community. Currently, the City of Grand Terrace is nearly built out; however, there are a few infill projects proposed within the City of Grand Terrace to revitalize key areas, including the core area around Barton Road and a few other locations that are predominantly west of I-215 as shown in Table 2.1.A.

The City of Colton is one of the oldest communities in the area and was incorporated in 1887. Residential areas are dominated by older residences due to the generally slow but steady development that has occurred throughout the City's history. *Colton, the Demographic, Economic, and Quality of Life Data* (2004) reports that the City of Colton has relatively little land available for residential development. For this reason, much of the new residential development in the City has occurred in the Reche Canyon area or infill lots; however, over 2,000 dwelling units are proposed as part of the Pellissier Ranch Specific Plan, although this project is delayed for the foreseeable future (refer to Table 2.1.A). As reported in *Colton, the Demographic, Economic, and Quality of Life Data* (2004), Colton also had limited available space for additional industrial and commercial operations, although there are still vacant areas in the vicinity of the Santa Ana River and Interstate 10 (I-10).

Table 2.1.A Planned Projects

Figure 2.1.3 Project ID Number	Project Name/Type	Location	Proposed Use/ Description	Status
City of Grand Terrace				
1	Town Square Master Development Plan	South side of Barton Road between Michigan Street/Gage Canal	209,611 sf over 5 development units; commercial, retail, and restaurant/fast food uses	Development Unit 1 (65,737 sf) approved with 45,000 sf already constructed. Auto Zone is moving one lot east to the Town Square project. Construction of the 7,842 sf building is anticipated to be completed in mid-2014.
2	Barton Plaza	Northwest corner of Barton Road and Mount Vernon Avenue	40,000 sf commercial	10,000 sf building constructed in Phase 1. Phases 2 and 3 have not started.
3	Techno-dynamics	21910 Vivienda Avenue	Single-family residential, 3 lots	Project approved. Project is not moving forward.
4	Greystone Group	11830 Mount Vernon Avenue	Single-family residential, 35 units	Project approved and map recorded. No construction has started.
5	Karger Pico Tract	North Side of Pico Street, east of Kingfisher Road	Single-family residential, 18 lots	Tentative tract map valid until 8/10/2016.
6	SCE Office Building	22200 Newport Avenue (SCE Vista Substation)	12,257 sf office building	Approved on 11/7/2013 by the Planning Commission.
7	Residential	12156 Preston Street	12 townhomes	Approved by the Planning Commission on December 19, 2013.
I-215 Freeway Projects				
8	I-215 Bi-County HOV Lane Gap Closure Project (SANBAG/RCTC/Caltrans)	On I-215 between SR-60 and Orange Show Road	Add HOV lanes in each direction	Under construction. Planned for completion in late 2015.
9	I-215/Mount Vernon Avenue/Washington Street Interchange Improvement Project (SANBAG/ Caltrans)	On I-215 at Mount Vernon Avenue/ Washington Street	Reconstruct interchange and local streets, add auxiliary lanes	Preliminary Engineering in progress. Planned for completion by 2020.
10	I-215 Bi-County Improvement Project (SANBAG/RCTC/ Caltrans)	On I-215 between SR-60 and Orange Show Road	Add one mixed-flow lane in each direction, add auxiliary lanes	Planned for completion prior to 2018.
11	Newport Avenue Overcrossing Over I-215 Reconstruction Project (SANBAG/Caltrans)	Over I-215 at Newport Avenue	Reconstruct overcrossing	Under construction. Planned for completion in mid-2014.
City of Colton				
12	The West Barton Road Connection	West Barton Road Bridge across the UPRR	Connection will provide for the ultimate design width for Barton Road of a 100 ft right of way.	Reprogramming funding. Planned for completion by 2015.
13	Pellissier Ranch Specific Plan	Pellissier Ranch Road	1,448 ac; 2,101 units residential, commercial, schools, parks	As of August 2012, this plan has been suspended indefinitely.
14	La Cadena Bridge over Santa Ana River Bridge Replacement Project	La Cadena Drive at the Santa Ana River	Reconstruct bridge	Preliminary Engineering. Planned for completion by 2017.
15	Washington Street Extension to La Cadena Drive Project	On Washington Street	Street extension and bridge over BNSF Railway	Project Study Phase. Planned for completion by 2030.

Sources: Sandra Molina, City of Grand Terrace Planning Manager (October 2013); Victor Ortiz, City of Colton Engineering Manager (July 2013); Mark Tomich, City of Colton Planning Director (October 2013).

Planned projects for the study area census tracts and adjacent areas are shown in Table 2.1.A. The locations of these projects are shown in Figure 2.1.3.

Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area.

Alternative 3 (Partial Cloverleaf Interchange)

Approximately 37 ac of land for right of way would be converted to transportation land uses. Potential full acquisitions under Alternative 3 would acquire approximately 20 ac of commercial/industrial land uses, 9 ac of residential uses, and 8 ac of vacant land uses. Five residential acquisitions would occur just west of I-215; three would occur in the proximity of Grand Terrace Road; and one would occur just south of Barton Road and west of La Crosse Avenue. Two of these properties are designated GC in the City of Grand Terrace General Plan (2010), and all of these residential properties are freeway-adjacent. Businesses that remain after Project construction would benefit from improved interchange operations, which would improve the use of this land. Terrace Village RV Park and Grand Terrace Mobile Home Park would lose the buffer (i.e., the commercial strip mall that currently separates them from the southbound I-215 off- ramp). However, because Alternative 3 would not change the existing land use in the Project area (transportation facility surrounded by residential, commercial, and industrial uses, land use compatibility impacts are not considered substantial.

Alternative 6 (Modified Cloverleaf Interchange)

Approximately 22 ac of land for right of way would be converted to transportation land uses; therefore, Alternative 6 would have fewer land use impacts than Alternative 3. Potential full acquisitions under Alternative 6 would convert approximately 8 ac of commercial/industrial land uses, 2 ac of residential uses, and 12 ac of vacant land uses. The two residential displacements for Alternative 6 are designated GC in the City of Grand Terrace General Plan (2010). Due to their proximity to I-215, designated land use, and proximity to other land use types, these residences are not a part of a well-established and cohesive community.

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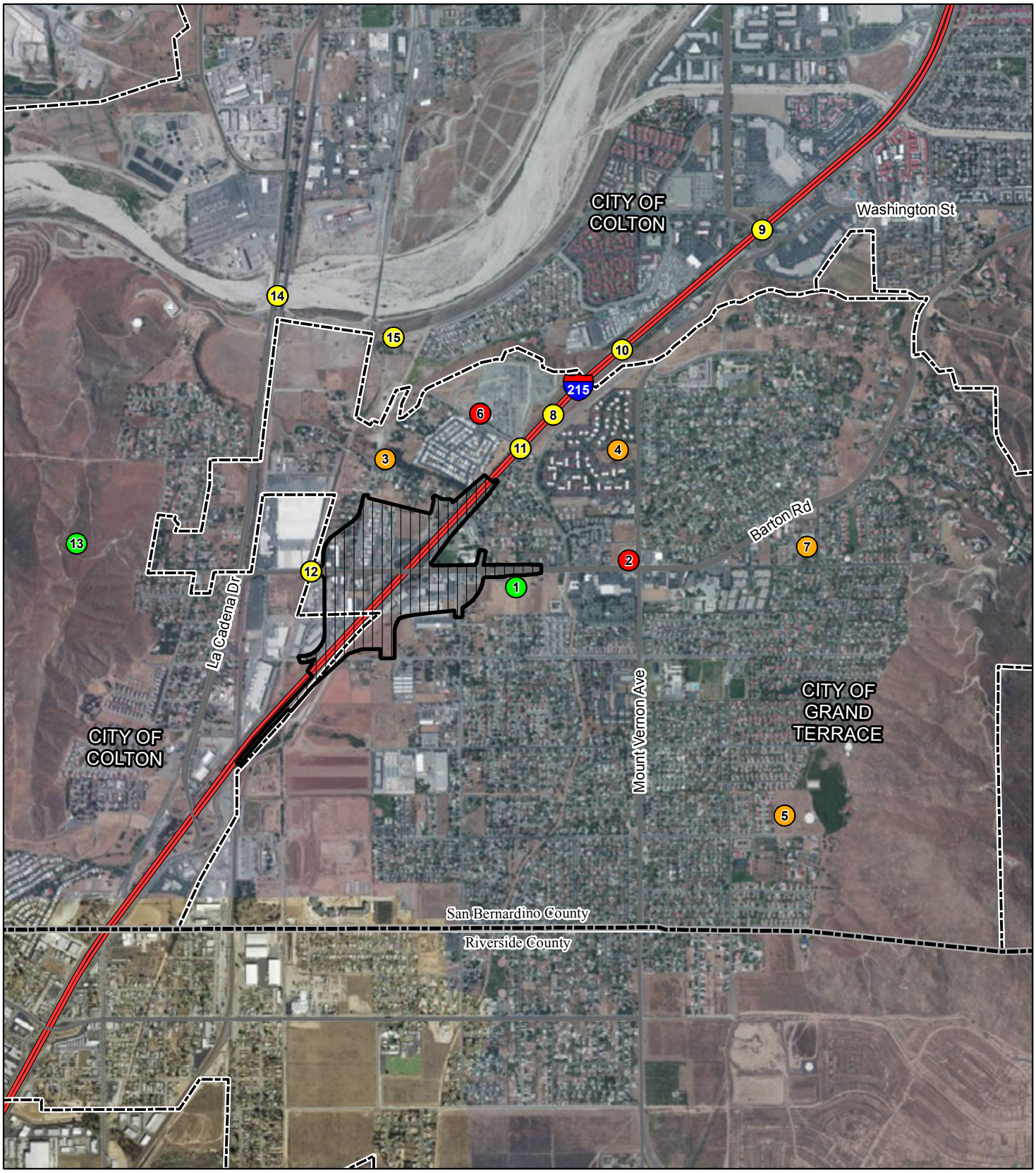

LEGEND

- Project Area
- County Boundary
- City Boundaries

Planned Projects

- Commercial
- Mixed-Use
- Residential
- Transportation

N

0 1000 2000
FEET

Note: Locations are approximate.

SOURCE: Microsoft (5/2010); City of Grand Terrace (2011); City of Colton (2011)

I:\SBA330\Barton_I-215\GIS\ISEA\CumulativeProjects.mxd (11/1/2013)

FIGURE 2.1.3

I-215/Barton Road Interchange Improvement Project

Planned Projects

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The conditions at Terrace Village RV Park and Grand Terrace Mobile Home Park would be similar to Alternative 3, although the ramps would not be as close to these properties as they would be under Alternative 3. Because Alternative 6 would not change the existing land use in the Project area (transportation facility surrounded by residential, commercial, and industrial uses), land use compatibility impacts are not considered substantial.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Modified Alternative 7 would widen and improve the existing I-215/Barton Road interchange and convert approximately 15 ac of existing land uses to transportation land uses; therefore, Modified Alternative 7 would have fewer land use impacts than Alternatives 3 or 6. Potential full acquisitions under Modified Alternative 7 would convert approximately 9 ac of commercial/industrial land uses, 2 ac of residential uses, and 4 ac of vacant land uses. Modified Alternative 7 would displace the same residential properties as Alternative 6 and, therefore, the land use impacts would be similar. Because Modified Alternative 7 would not change the existing land use in the project area (transportation facility surrounded by residential, commercial, and industrial uses), land use compatibility impacts are not considered substantial.

2.1.2 Consistency with State, Regional, and Local Plans

This section discusses the Project's consistency with the Southern California Association of Government's (SCAG's) 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (2012 RTP/SCS), SCAG's 2013 Federal Transportation Improvement Program (2013 FTIP), and San Bernardino Associated Governments' (SANBAG's) 2009 Congestion Management Program (2009 CMP). Additionally, the Project's consistency with adopted goals, policies, and plans from the Circulation Element of the City of Grand Terrace General Plan (2010), the City of Grand Terrace's Barton Road Specific Plan, the Mobility Element of the City of Colton General Plan (2013) and the City of Colton's Pellissier Ranch Specific Plan.

2.1.2.1 Regional Transportation Plan/Sustainable Communities Strategy

SCAG's 2012 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 found to conform by the Federal Highway Administration/Federal Transit Administration (FHWA/FTA) on June 12,

2012. 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 Project is included as a "Financially-Constrained RTP Project" in the 2012-2035 RTP/SCS.

On June 6, 2013, SCAG's Transportation Committee approved Amendment #1 to the 2012-2035 RTP/SCS and Amendment #13-04 to the 2013 Federal Transportation Improvement Program (2013 FTIP). The Amendment was developed as a response to changes to projects in the 2012-2035 RTP/SCS and the 2013 FTIP. Amendment #1 to the 2012-2035 RTP/SCS and Amendment #13-04 to the 2013 FTIP were found to conform by the Federal Highway Administration/Federal Transit Administration (FHWA/FTA) on July 15, 2013. The Project's schedule and description are consistent with information regarding the Project associated with Amendment #1 to the 2012-2035 RTP/SCS.

2.1.2.2 Federal Transportation Improvement Program

The FTIP is a capital listing of all transportation projects proposed over a 6-year period for the SCAG region. It is prepared to implement 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.

The 2013 FTIP was adopted by SCAG on September 19, 2012, and approved by FHWA/FTA on December 14, 2012. Amendments to the adopted 2013 FTIP are prepared and approved on a continual basis. The Project's schedule and description are consistent with information regarding the Project associated with Amendment #13-04 to the 2013 FTIP. The Project is included in the most current version of SCAG's 2013 FTIP (with Amendments).

2.1.2.3 San Bernardino Associated Governments Congestion Management Program

SANBAG's 2009 CMP identifies the goals of the program, defines legal requirements, and provides background information and descriptions of each element, component, and requirement of the program. A major update is planned in mid-2014.

The CMP defines the network of State highways and arterials, describes level of service (LOS) standards for major road facilities, and provides technical justification for the approach to congestion management. The decisions in the CMP are continuously reviewed through meetings of the Technical Advisory Committee and its subcommittees, the Plans and Programs Policy Committee and the SANBAG Board of Directors. The Project is included in the *Development Mitigation Nexus Study* (Appendix K of the 2009 CMP). The Nexus Study identifies the fair share contributions from new development for regional transportation improvements (freeway interchanges, railroad grade separations, and regional arterial highways). The Nexus Study is updated biennially or as requested and in close coordination with local jurisdictions.

2.1.2.4 City of Grand Terrace General Plan Circulation Element (2010)

In the City of Grand Terrace General Plan Circulation Element, Barton Road is defined as a Major Highway (100-foot [ft] right of way with a 72 ft improved section). As discussed in the Circulation Element: "Major Highways provide service to non-local through trips as well as limited local access. They often provide direct service to major commercial and industrial areas. Typically, Major Highways are characterized with four travel lanes, minimal curb cuts, and signalized intersections."

The General Plan also indicates that the City should seek alternative funding sources to supplement Measure I funding for the expansion of the Barton Road interchange.

The Project is consistent with applicable City of Grand Terrace General Plan Circulation Element (2010) goals and policies to improve transportation corridors, provide adequate infrastructure, maintain efficient traffic operations on City streets, work with Caltrans and SANBAG to find solutions for transportation problems in the I-215 corridor area, and support the City's bikeway network and other alternative modes of transportation.

The Circulation Element of the City of Grand Terrace General Plan includes the Bikeway Plan (Exhibit 3-2: Existing and Proposed Bikeway Plan in the Circulation Element of the General Plan). Refer to Figure 2.5.1 in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities, for an illustration of the existing and proposed bikeway system. As shown in this figure, bikeways are proposed for all arterial streets and connect residential neighborhoods to schools, parks, and retail centers.

2.1.2.5 City of Grand Terrace Barton Road Specific Plan (2003)

The Barton Road Specific Plan (BRSP) encompasses an approximately 1.3-mile corridor along Barton Road extending from Interstate 215 on the west, to the intersection of Barton Road and Victoria Street on the east. The BRSP was first approved in 1988 and formally updated in 2003.

The purpose of the BRSP and the associated Barton Road Specific Plan Zoning District is to assure the systematic implementation of the City of Grand Terrace's General Plan within the Specific Plan area, The BRSP provides a comprehensive plan of land use, development regulations, design guidelines, development incentives and other related actions aimed at implementing the goals and objectives set forth in the plan. The BRSP constitutes the legally established zoning for properties within the plan area and establishes certain development regulations, standards, and guidelines within the Barton Road corridor, a key transportation corridor through the City of Grand Terrace. The Barton Road Specific Plan contains guidelines for commercial and office development within three subareas of the Specific Plan: General Commercial (GC), Village Commercial (VC), and Office/Professional (AP). The Barton Road Specific Plan area boundary extends through the commercial and residential area on the south and north of Barton Road, including Grand Terrace Elementary School, which is adjacent to the Project site. The Project is consistent with applicable aspects of the City of Grand Terrace Barton Road Specific Plan.

2.1.2.6 City of Colton General Plan Mobility Element (2013)

The City of Colton's General Plan Mobility Element was adopted on August 20, 2013. Relevant mobility-related goals and policies in the City of Colton General Plan Mobility Element are analyzed herein.

The Project is consistent with the applicable City of Colton General Plan Mobility Element goals and policies to provide an integrated and balanced multi-modal transportation network, provide appropriate access and adequate capacity at freeway interchanges, and coordinate with other jurisdictions and agencies on regional transportation projects.

2.1.2.7 City of Colton Pellissier Ranch Specific Plan

This Pellissier Ranch Specific Plan was initially developed in 2008. The proposed Specific Plan would regulate development on approximately 1, 448 acres (ac), with 2,101 dwelling units on approximately 319 ac, an urban village center on approximately 56 ac, and a business park on approximately 130 ac. As discussed in the April 2008 Notice of Preparation, "[t]he proposed Pellissier Ranch Specific Plan

would… lead to the future development of an urban village consisting of a variety of land uses that would include a wide mix of residential types, schools, parks, retail and entertainment, professional office, public utility facilities, business parks and light industrial focused around clean technologies." An internal draft specific plan and environmental impact report were prepared, but the project was put on hold sometime in 2009/2010. The City Council has defunded the project, and it has been suspended indefinitely, according to Mark Tomich, Development Services Director.[1]

2.1.3 Environmental Consequences

The Project is consistent with applicable City of Grand Terrace General Plan (2010) goals and policies to improve transportation corridors, provide adequate infrastructure, maintain efficient traffic operations on City streets, work with Caltrans and SANBAG to find solutions for transportation problems in the I-215 corridor area, and support the City's bikeway network and other alternative modes of transportation. The Project is also consistent with the applicable City of Colton General Plan Mobility Element (2013) goals and policies to provide an integrated and balanced multi-modal transportation network, provide appropriate access and adequate capacity at freeway interchanges, and coordinate with other jurisdictions and agencies on regional transportation projects. The Project is consistent with the applicable City of Colton General Plan Draft Mobility Element goals and policies to provide an integrated and balanced multi-modal transportation network, provide appropriate access and adequate capacity at freeway interchanges, and coordinate with other jurisdictions and agencies on regional transportation projects.

The Project is included in the 2012-2035 RTP/SCS, included in the 2013 FTIP, and is consistent with SANBAG's 2009 CMP. Therefore, the Project is consistent with the approved transportation plans.

The discussion below provides a summary of the consistency of the Project Alternatives with State, regional, and local plans.

2.1.3.1 Regional Transportation Plan/Sustainable Communities Strategy and Federal Transportation Improvement Program

The SCAG 2012-2035 RTP/SCS and 2013 FTIP establish a transportation vision for Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial Counties to

[1] Email correspondence, October 2013.

reduce traffic congestion and improve operations. The I-215/Barton Road Interchange Project is identified in the RTP/SCS and programmed in the FTIP.

Alternative 1 (No Build Alternative)

The No Build Alternative does not propose the improvements to the I-215/Barton Road interchange identified in the RTP/SCS and the FTIP. Therefore, Alternative 1 would not be consistent with the RTP/SCS and the FTIP.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

By contrast, the Build Alternatives, Alternatives 3, 6, and Modified Alternative 7 are consistent with the project description in the 2012-2035 RTP/SCS and the 2013 FTIP. Therefore, as discussed above, Alternatives 3, 6, and Modified Alternative 7 are consistent with the 2012-2035 RTP/SCS and the 2013 FTIP.

2.1.3.2 City of Grand Terrace General Plan Circulation Element (2010)

Goal 3.1. Provide a comprehensive transportation system that provides for the current and long-term efficient movement of people and goods within and through the City.

Alternative 1 (No Build Alternative)

The No Build Alternative would not improve the existing Barton Road interchange; therefore, it would not support a comprehensive transportation system for the long-term efficient movement of people and goods in the City. Therefore, Alternative 1 would not be consistent with Goal 3.1 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

By contrast, the Build Alternatives, Alternatives 3, 6, and Modified Alternative 7 would improve operations and reduce congestion at the Barton Road interchange and would, therefore, support a comprehensive transportation system for the long-term efficient movement of people and goods in the City of Grand Terrace. Therefore, Alternatives 3, 6, and Modified Alternative 7 are consistent with Goal 3.1 of the City of Grand Terrace General Plan.

Policy 3.1.1. Provide a transportation system which supports planned land uses and improves the quality of life.

Alternative 1 (No Build Alternative)

The No Build Alternative does not support the planned uses in the vicinity of the interchange because there is not enough capacity to support development consistent

with the City's General Plan. One study area intersection would operate at unsatisfactory LOS in 2016, and all intersections would operate at unsatisfactory LOS in 2040 except one intersection in the AM peak hour. As such, the quality of life for those using the interchange would deteriorate. Therefore, Alternative 1 would not be consistent with Policy 3.1.1 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

In comparison, the Build Alternatives, Alternatives 3, 6, and Modified Alternative 7 would support the planned uses in the vicinity of the interchange by improving operation and reducing congestion. All study area intersections would operate at satisfactory LOS in 2016. All study area intersections would operate at satisfactory LOS in 2040 except one intersection in the PM peak hour, which could be improved via a separate widening project. As such, the quality of life for those using the interchange would improve under Alternatives 3, 6, and Modified Alternative 7. Therefore, Alternatives 3, 6, and Alternative 7 would be consistent with Policy 3.1.1 of the City of Grand Terrace General Plan.

Policy 3.1.2. An arterial street system shall be established that provides for the collection of local traffic and provide for the efficient movement of people and goods through the City.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include major improvements to the arterial streets in the vicinity of the interchange. Intersection LOS in the interchange area will continue to degrade, preventing the efficient movement of people and goods through the City. Therefore, Alternative 1 would not be consistent with Policy 3.1.2 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

In comparison, the Build Alternatives, Alternatives 3, 6, and Modified Alternative 7 would improve LOS at local intersections in the interchange area, which would provide for the collection of local traffic and efficient movement of people and goods through the City. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.1.2 of the City of Grand Terrace General Plan.

Policy 3.1.3. Commerce Way shall provide for the movement of traffic associated with commercial and business traffic.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include improvements to Commerce Way, but it would still provide for the movement of traffic associated with commercial and business traffic. Therefore, Alternative 1 would be consistent with Policy 3.1.3 of the City of Grand Terrace General Plan.

Alternative 3 (Partial Cloverleaf Interchange)

Alternative 3 would include realignment of Commerce Way with new intersections at Michigan Avenue and Barton Road. The realignment would provide for the movement of commercial and business traffic. Therefore, Alternative 3 would be consistent with Policy 3.1.3 of the City of Grand Terrace General Plan.

Alternative 6 (Modified Cloverleaf Interchange)

Alternative 6 would include realignment of Commerce Way with the existing intersection at Michigan Avenue and a new intersection at Barton Road. In addition, Commerce Way would connect to the reconstructed I-215 northbound on- and off-ramps. The realignment would provide for the movement of commercial and business traffic. Therefore, Alternative 6 would be consistent with Policy 3.1.3 of the City of Grand Terrace General Plan.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Modified Alternative 7 would include realignment of Commerce Way with the existing intersection at Michigan Avenue and a new intersection at Barton Road. The realignment would provide for the movement of commercial and business traffic. Therefore, Modified Alternative 7 would be consistent with Policy 3.1.3 of the City of Grand Terrace General Plan.

Policy 3.1.4. The City shall cooperate with SANBAG and Caltrans for the transportation planning, programming and implementation of agencies such as SCAG, Caltrans, SANBAG, and the cities of San Bernardino County, as well as neighboring jurisdictions in Riverside County on various studies relating to freeway, high occupancy vehicle/high occupancy toll lanes and transportation corridor planning, construction, and improvement and ultimate expansion of I-215 between SR-91/I-215/SR-60 and I-10 in order to

facilitate the planning and implementation of an integrated circulation system in accordance with regional planning goals.

Alternative 1 (No Build Alternative)

The No Build Alternative would not provide improvements to the I-215/Barton Road Interchange; therefore, it would not support transportation planning for this interchange as proposed by Caltrans and SANBAG. The No Build Alternative would not support an integrated circulation system along I-215 in accordance with regional planning goals. Therefore, Alternative 1 would not be consistent with Policy 3.1.4 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Caltrans, SANBAG, and the Cities of Grand Terrace and Colton are and have been, directly involved with the Project Development Team (PDT) for the planned I-215/Barton Road Interchange Improvement Project. The Build Alternatives, Alternative 3, 6, and Modified Alternative 7 would be consistent with the I-215 Bi-County HOV Lane Gap Closure Project as well as the future I-215 Widening Project; all three alternatives would facilitate the implementation of an integrated circulation system in accordance with regional planning goals. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.1.4 of the City of Grand Terrace General Plan.

Goal 3.3. Provide for a safe circulation system.

Alternative 1 (No Build Alternative)

The No Build Alternative would not provide improvements to the I-215/Barton Road Interchange and local intersections; however, the interchange area is not considered unsafe. Therefore, Alternative 1 would be consistent with Goal 3.2 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would improve local intersections and would replace deficient ramps and the bridge over I-215. Improvements would be consistent with current Highway Capacity Manual standards, which would improve operations. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Goal 3.2 of the City of Grand Terrace General Plan.

Policy 3.3.1. Promote the safe and effective movement of all segments of the population and the efficient transport of goods.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include major improvements to the arterial streets in the vicinity of the interchange. Intersection LOS in the interchange area would continue to degrade, preventing the efficient movement of people and goods through the City. Therefore, Alternative 1 would not be consistent with Policy 3.3.1 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would improve LOS at local intersections in the interchange area, which would improve the efficiency of people and goods movement. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.3.1 of the City of Grand Terrace General Plan.

Policy 3.3.3. The City shall ensure that local street improvements are designed with proper attention to community appearance and aesthetics as well as the need to move traffic safely and efficiently.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include major improvements to the arterial streets in the vicinity of the interchange and no aesthetic improvements would be made. Therefore, Alternative 1 would not be consistent with Policy 3.3.3 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would improve traffic operations in the interchange area, which would improve efficiency. As part of Alternatives 3, 6, and Modified Alternative 7, landscape and hardscape improvements would be implemented consistent with the I-215 Bi-County Aesthetic Concept prepared by Caltrans as well as City standards. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.3.3 of the City of Grand Terrace General Plan.

Policy 3.3.4. The City shall route truck traffic away from residential areas and work with regional agencies in order to mitigate potential impacts from regional traffic.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include improvements to the interchange to allow large truck movements. As such, trucks may circulate through residential areas to access adjacent interchanges, which could impact traffic operations. Therefore, Alternative 1 would not be consistent with Policy 3.3.4 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, include improvements to the interchange to allow large truck movements so that trucks do not need to detour to adjacent interchanges, which could impact traffic operations. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.3.4 of the City of Grand Terrace General Plan.

Goal 3.4. Provide for an efficient and safe bikeway system within the City.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include bikeways on both sides of Barton Road within the Project limits. Therefore, Alternative 1 would not be consistent with Goal 3.4 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would include Class II (on-road striped) bicycle lanes on both sides of Barton Road within the Project limits. This is consistent with the Bikeway Plan in the Circulation Element of the General Plan and would expand the City bikeway system (refer to Figure 2.5.1 in Section 2.5, Traffic and Transportation/Pedestrian and Bicycle Facilities). Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Goal 3.4 of the City of Grand Terrace General Plan.

Policy 3.4.1. Develop a system of continuous and convenient bicycle routes designed to connect schools, residential areas, shopping centers, parks, and employment areas.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include bikeways on both sides of Barton Road within the Project limits. Therefore, Alternative 1 would not be consistent with Policy 3.4.1 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would include Class II (on-road striped) bicycle lanes on each side of Barton Road within the Project limits. This would connect a school, residential areas, and employment areas. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.4.1 of the City of Grand Terrace General Plan.

Policy 3.4.2. The City shall promote and facilitate the use of bicycles as an alternative mode of transportation through the development of a City-wide network of bikeways.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include bikeways. Therefore, Alternative 1 would not be consistent with Policy 3.4.2 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would include Class II (on-road striped) bicycle lanes on each side of Barton Road within the Project limits. This would increase the bikeway network. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.4.2 of the City of Grand Terrace General Plan.

Goal 3.5. Provide for efficient alternative methods of travel.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include bikeways or sidewalks to increase pedestrian or bicycle circulation. Therefore, Alternative 1 would not be consistent with Goal 3.5 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would include Class II (on-road striped) bicycle lanes and sidewalks on each side of Barton Road within the Project limits. This would connect a school, residential areas, and employment areas. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Goal 3.5 of the City of Grand Terrace General Plan.

Policy 3.5.7. The City shall provide amenities along the Barton Road corridor that promote pedestrian and bicyclist use, such as a continued system of pedestrian paths and bike lanes to connect the City Center with schools, parks, and residential areas.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include bikeways or sidewalks to increase pedestrian or bicycle circulation. Therefore, Alternative 1 would not be consistent with Policy 3.5.7 of the City of Grand Terrace General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Alternatives 3, 6, and Modified Alternative 7 would include Class II (on-road striped) bicycle lanes and sidewalks on each side of Barton Road within the Project limits. This would connect a school, residential areas, and employment areas. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy 3.5.7 of the City of Grand Terrace General Plan.

2.1.3.3 Barton Road Specific Plan (2003)

Community Design Objectives (4th Item)

Through continued implementation of the City street tree program, promote contemporary landscape treatments throughout the corridor. The landscaping should be of a drought-tolerant, low-maintenance nature and able to withstand occasional high winds and intense urban conditions, such as smog and automobile exhaust.

Community Design Policies (1st Item)

Develop consistent streetscape and architectural palettes that are sensitive to the creation of a "village" statement for Barton Road. (It is not the intent of this thematic requirement to discourage innovative or contemporary architectural expressions or to imitate the architecture of the past, but to promote the harmonious coexistence of architectural styles varying from restoration to contemporary architectural themes).

Transportation Plan Development Standards

1. All roads within the Plan Area shall be improved to the ultimate standard of the General Plan Circulation Element.
2. All road improvements shall comply with the standard specifications of the San Bernardino County Transportation Department unless otherwise amended by the City of Grand Terrace.
4. Sidewalks shall be provided along all city roadways per City standard specifications.
5. Bikeways shall be provided in accordance with the City of Grand Terrace Bicycle Transportation Plan.

Alternative 1 (No Build Alternative)

The No Build Alternative would not support the Barton Road Specific Plan because it would result in no improvements to the interchange area. Lack of improvements at the I-215/Barton Road interchange would result in continued deterioration of the LOS at the interchange and directly associated local intersections. This would be inconsistent with the BRSP's overall goal to create a dynamic "downtown" commercial center that is attractive and of high quality, unifying community design image, reflective of a "village" identity, and providing an economically viable setting for a balanced mixture of commercial and administrative/professional uses with safe, efficient circulation and access.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would improve operations and reduce congestion at the I-215/Barton Road interchange; which would be supportive of the BRSP's overall goal. Alternatives 3, 6, and Modified Alternative 7 are consistent with applicable provisions of the Barton Road Specific Plan.

2.1.3.4 City of Colton General Plan Mobility Element (2013)

Goal M-1. Provide an integrated and balanced multi-modal transportation network of Complete Streets to meet the needs of all users and transportation modes.

Alternative 1 (No Build Alternative)

The No Build Alternative would not improve the I-215/Barton Road interchange; therefore, it would not provide bikeways, sidewalks, or roadway improvements that would meet the needs of all users and transportation modes in the Project area. Accordingly, Alternative 1 would not be consistent with Goal M-1 of the Mobility Element of the City of Colton General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would provide a range of improvements designed to serve drivers, bicyclists, and pedestrians, including Class II (on-road striped) bicycle lanes, sidewalks on each side of Barton Road within the Project limits, and roadway improvements that would improve LOS at local intersections in the interchange area. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Goal M-1 of the Mobility Element of the City of Colton General Plan.

Policy M-1.1. Provide for the needs of drivers, public transportation vehicles and patrons, bicyclists, and pedestrians of all ages and abilities in planning, programming, design, construction, reconstruction, retrofit, operations, and maintenance activities of all streets.

Alternative 1 (No Build Alternative)

The No Build Alternative would not improve the I-215/Barton Road interchange; therefore, it would not provide bikeways, sidewalks, or roadway improvements that would meet the needs of the community's drivers, public transportation vehicles and patrons, bicyclists, and pedestrians in the Project area. Therefore, Alternative 1 would not be consistent with Policy M-1.1 of the Mobility Element of the City of Colton General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would provide a range of improvements designed to serve drivers, bicyclists, and pedestrians, including Class II (on-road striped) bicycle lanes, sidewalks on each side of Barton Road within the Project limits, and roadway improvements that would improve LOS at local intersections in the interchange area. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy M-1.1 of the Mobility Element of the City of Colton General Plan.

Policy M-1.2. View all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in Colton. Recognize bicycle, pedestrian, and transit modes as integral elements of the transportation system.

Alternative 1 (No Build Alternative)

The No Build Alternative would not improve the I-215/Barton Road interchange and local intersections; therefore, it would not provide bikeways, sidewalks, or roadway

improvements to improve safety, access, and mobility for bicyclists, pedestrians, and transit users in the Project area. Therefore, Alternative 1 would not be consistent with Policy M-1.2 of the Mobility Element of the City of Colton General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would provide Class II (on-road striped) bicycle lanes and sidewalks on each side of Barton Road within the Project limits, thereby improving safety, access, and mobility for bicyclists and pedestrians in the Project area. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy M-1.2 of the Mobility Element of the City of Colton General Plan.

Goal M-4. Provide appropriate access, logical configuration, and adequate capacity at freeway interchanges, street and rail intersections, and at bridges.

Alternative 1 (No Build Alternative)

The No Build Alternative would not provide improvements to the I-215/Barton Road Interchange or arterial streets in the vicinity of the interchange. One study area intersection would operate at unsatisfactory LOS in 2016, and all intersections would operate at unsatisfactory LOS in 2040 except one intersection in the AM peak hour. The non-standard connection of the southbound off-ramp to a local road (La Crosse Avenue) would remain. Since the No Build Alternative would not provide adequate capacity to meet projected traffic volumes at the I-215/Barton Road Interchange, the Barton Road Overcrossing, or local street intersections in the area, Alternative 1 would not be consistent with Goal M-4 of the Mobility Element of the City of Colton General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

In comparison, the Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would improve local intersections and would replace deficient ramps and the Barton Road Overcrossing bridge over I-215. Improvements would be consistent with current Highway Capacity Manual standards, which would improve operations. All study area intersections would operate at satisfactory LOS in 2016. All study area intersections would operate at satisfactory LOS in 2040 except one intersection in the PM peak hour, which could be improved via a separate widening project. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Goal M-4 of the Mobility Element of the City of Colton General Plan.

Policy M-4.6. Ensure that all interchange reconfiguration projects, grade separation improvements, and bridge widening projects be designed and implemented in a manner that provides positive benefit to the City of Colton.

Alternative 1 (No Build Alternative)

The No Build Alternative would not provide improvements to the I-215/Barton Road Interchange and would not reconstruct the Barton Road bridge over I-215. Therefore, Policy M-4.6 of the Mobility Element of the City of Colton General Plan would not apply to Alternative 1.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would improve local intersections and would replace deficient ramps and the Barton Road bridge over I-215, which would improve LOS at local intersections in the interchange area. By improving traffic operations and reducing congestion at the I-215/Barton Road Interchange, Alternatives 3, 6, and Modified Alternative 7 would result in reduced traffic delays for drivers traveling between La Cadena Drive in the southern portion of the City of Colton and I-215. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy M-4.6 of the Mobility Element of the City of Colton General Plan.

Goal M-7. Coordinate with other jurisdictions and agencies on regional transportation projects.

Alternative 1 (No Build Alternative)

The No Build Alternative would not provide improvements to the I-215/Barton Road Interchange; therefore, it would not support regional transportation planning for this interchange as proposed by Caltrans and SANBAG. Although Caltrans, SANBAG, and the Cities of Grand Terrace and Colton are and have been, directly involved with the Project Development Team (PDT) for the planned I-215/Barton Road Interchange Improvement Project, which has included the study of Alternative 1, the No Build Alternative, Alternative 1 would not result in a transportation project being constructed.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Caltrans, SANBAG, and the Cities of Grand Terrace and Colton are and have been, directly involved with the Project Development Team (PDT) for the planned I-215/Barton Road Interchange Improvement Project. All of the Build Alternatives,

Alternatives 3, 6, and Modified Alternative 7, would result in a transportation project. Coordination has been occurring during the project development process, consistent with Goal M-7 of the Mobility Element of the City of Colton General Plan.

Policy M-7.3. Consult with Caltrans, SCAG, the South Coast Air Quality Management District, SANBAG, Omnitrans, San Bernardino County, Riverside County, and the cities of Rialto, San Bernardino, Loma Linda, Grand Terrace, and Riverside to coordinate regional transportation facilities, and to pursue Federal, State, and regional funds for local and regional traffic improvements.

Alternative 1 (No Build Alternative)

The No Build Alternative would not provide improvements to the I-215/Barton Road Interchange; therefore, it would not support local and regional traffic improvements for this interchange as proposed by Caltrans and SANBAG. Therefore, Alternative 1 would not be consistent with Policy M-7.3 of the Mobility Element of the City of Colton General Plan.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Caltrans, SANBAG, and the Cities of Grand Terrace and Colton are and have been, directly involved with the Project Development Team (PDT) for the planned I-215/Barton Road Interchange Improvement Project. All of the Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would result in a transportation project. Alternative 3, 6, and Modified Alternative 7 would be consistent with the I-215 Bi-County HOV Lane Gap Closure Project as well as the future I-215 Widening Project; therefore, all three alternatives would be consistent with implementation of an integrated circulation system in accordance with regional planning goals. Therefore, Alternatives 3, 6, and Modified Alternative 7 would be consistent with Policy M-7.3 of the Mobility Element of the City of Colton General Plan.

2.1.3.5 San Bernardino Associated Governments Congestion Management Program

The SANBAG 2009 CMP sets LOS standards for the freeway segments and street network.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include improvements at the I-215/Barton interchange. As discussed above, all study area intersections would operate at

unsatisfactory LOS in 2040 except one intersection in the AM peak hour. Therefore, Alternative 1 would not be consistent with the SANBAG CMP.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, would be consistent with the 2009 CMP because they would each improve LOS in the Interchange area. All study area intersections would operate at satisfactory LOS in 2040 except one intersection in the PM peak hour, which could be improved via a separate widening project. Alternatives 3, 6, and Modified Alternative 7 would be consistent with SANBAG's 2009 CMP.

2.1.4 Avoidance, Minimization, and/or Mitigation Measures

Alternative 1, the No Build Alternative, is not supportive of the applicable local plans and is inconsistent with the applicable regional plans. If Alternative 1 were identified as the Preferred Alternative for the Project, SCAG's 2012-2035 RTP/SCS and 2013 FTIP would have to be updated in conjunction with an Amendment that would include a modeling update, which would be a major update.

The Build Alternatives, Alternatives 3, 6, and Modified Alternative 7, are all supportive of the applicable local plans, and consistent with specific applicable components. Modified Alternative 7, the Preferred Alternative, does not currently require any updates to plans, although an update related to the cost of Modified Alternative 7 may occur in regional plans in conjunction with the beginning of the Final Design, upon confirmation that not all of the funding currently planned for the I-215/Barton Road Interchange Improvement Project is needed.

If either Alternative 3 or 6 were identified as the Preferred Alternative for the Project, which has not happened and is not expected to occur, SCAG's 2012-2035 RTP/SCS and 2013 FTIP could require some detail-level update related to the Project's cost and description; however, this could be readily accomplished in conjunction with an Administrative Modification.

2.1.5 Parks and Recreational Facilities

There are four parks or recreational facilities within 0.5 mile (mi) of the Project area (Pico Park, Grand Terrace Fitness Park, Cal Skate, and the Santa Ana River Trail).

Pico Park is located 0.3 mi southeast of I-215/Barton Road interchange at 21950 Pico Street in the City of Grand Terrace. This 9.3 ac park includes two basketball courts, one shelter with six tables and two barbecues, picnic tables, playgrounds, a tot lot

area, walking/jogging tracks, two baseball/softball diamonds, and 24-hour video surveillance for the safety of park patrons.

Grand Terrace Fitness Park is located immediately adjacent to the Project footprint along Grand Terrace Road near the intersection of Grand Terrace Road and Vivienda Avenue. The City of Grand Terrace purchased the property for this park in August 2011 and construction began in January 2012. It was opened to public use in July 2013. Currently, the Fitness Park includes: fitness stations, covered picnic tables, restrooms, a drinking fountain, walking paths, a tennis court, a children's slide, on-site parking, a storage building, trash receptacles, lighting, and environmentally conservative landscaping. The City of Grand Terrace prepared a new parcel map that identifies a planned road easement on the southern portion of the property. This road easement (to be named Fitness Park Way) is consistent with the width of the new local road, and is part of all the Build Alternatives. This map was approved by the City Council on September 10, 2013. The parcel map was submitted to the County of San Bernardino for recording on September 17, 2013. The park is still undergoing construction and is scheduled to be completed in July 2014. Items to be added prior to park completion include: a community activities area, a handball court, a turf area, and additional playground equipment.

Cal Skate Grand Terrace is a roller skating rink within the Project footprint at 22080 Commerce Way. This privately-owned facility is open to the public and provides roller skating lessons, open skating, and private skating parties.

The Santa Ana River Trail is located approximately 0.3 mi north of the I-215/Barton Road interchange and runs parallel to the Santa Ana River. The trail crosses three counties: San Bernardino, Riverside, and Orange Counties, and provides access from the San Bernardino Mountains to the mouth of the Santa Ana River at the Pacific Ocean. The section of the Santa Ana River Trail in the study area is managed by the San Bernardino County Regional Parks Department. The Santa Ana River Trail provides for walking, jogging, bicycling, and horseback riding.

2.1.5.1 Environmental Consequences

Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, it would not result in temporary impacts to parks or recreational facilities.

Alternative 3 (Partial Cloverleaf Interchange)

All impacts to parks and recreational facilities under Alternative 3 would be permanent and are discussed below.

Alternative 6 (Modified Cloverleaf Interchange) and Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Construction of Alternative 6 and Modified Alternative 7 would require Temporary Construction Easements (TCEs) at Cal Skate Grand Terrace. Access to this roller skating rink would be maintained during construction. The roller skating rink is enclosed in a building and would not be exposed to construction-related air quality or noise impacts in levels that would prevent use of the facility.

Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, it would not result in permanent impacts to parks or recreational facilities.

Alternative 3 (Partial Cloverleaf Interchange)

Alternative 3 would require the full acquisition of Cal Skate Grand Terrace. As discussed in Section 2.3.1.3 of Section 2.3, Community Impacts, there are replacement properties available within the City of Grand Terrace that could accommodate the relocation of this business.

For a complete discussion of Section 4(f) resources (Pico Park, Grand Terrace Fitness Park, and the Santa Ana River Trail), please see Appendix B of this Environmental Document. As discussed in Appendix B, there would be no use of Section 4(f) resources as defined in 23 Code of Federal Regulations (CFR) 774.17 and 23 CFR 774.15. That is: (1) no land from a Section 4(f) resource would be permanently incorporated into the Project right of way, (2) the temporary occupancy would not be adverse in terms of the Section 4(f) statute's preservationist purposes, and (3) there would be no constructive use of land that would impair the activities, features, or attributes of a Section 4(f) resource.

Alternative 3 would not acquire any parks or recreation facilities protected by the Park Preservation Act.

Alternative 6 (Modified Cloverleaf Interchange) and Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Alternative 6 and Modified Alternative 7 would require the partial acquisition of Cal Skate Grand Terrace. This partial acquisition would occur in the parking lot of the skate park and would remove approximately three parking spaces for both alternatives, which would not substantially impact the facility.

For a complete discussion of Section 4(f) resources (Pico Park, Grand Terrace Fitness Park, and the Santa Ana River Trail), refer to Appendix B. As discussed in Appendix B, there would be no use of Section 4(f) resources as defined in 23 CFR 774.17 and 23 CFR 774.15. That is: (1) no land from a Section 4(f) resource would be permanently incorporated into the Project right of way, (2) the temporary occupancy would not be adverse in terms of the Section 4(f) statute's preservationist purposes, and (3) there would be no constructive use of land that would impair the activities, features, or attributes of a Section 4(f) resource.

Alternative 6 and Modified Alternative 7 would not acquire any parks or recreation facilities protected by the Park Preservation Act.

2.1.5.2 Avoidance, Minimization, and/or Mitigation Measures

Alternative 1 (No Build Alternative)

No measures are required for Alternative 1.

Alternative 3 (Partial Cloverleaf Interchange)

If Alternative 3 were identified as the Preferred Alternative for the Project, Cal Skate Grand Terrace would be displaced and relocated. As discussed in Section 2.3.2.4 of this Environmental Document, replacement properties are expected to be available within the City of Grand Terrace and/or the City of Colton that could accommodate the relocation of this business. Measure REL-1 would be implemented in this regard.

Alternative 6 (Modified Cloverleaf Interchange) and Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

If Alternative 6 or Modified Alternative 7 were identified as the Preferred Alternative for the Project, Temporary Construction Easements (TCEs) at Cal Skate Grand Terrace are anticipated to be needed. To minimize impacts, the following measure would be implemented in addition to compensation for use and restoration of the portion of the property after use in conjunction with the temporary construction easement:

PRF-1 **Cal Skate Grand Terrace Access.** Access to Cal Skate Grand Terrace roller skating rink will be maintained throughout construction for Alternative 6 and Modified Alternative 7.

Alternative 6 and Modified Alternative 7 are anticipated to require a partial acquisition of Cal Skate Grand Terrace; removing approximately three parking spaces from the parking lot of the skate park for both alternatives. Relocation is not expected, and compensation for this permanent acquisition is anticipated to minimize this impact.

The following avoidance measure will be implemented to facilitate construction of the Project resulting in no impacts to Grand Terrace Fitness Park.

PRF-2 **Grand Terrace Fitness Park Access.** The construction contract will specifically stipulate that no staging or storage of materials will be allowed on any part of Grand Terrace Fitness Park for any duration, and further that no obstruction of access to the Park will be allowed at any time in conjunction with Project Construction. Additionally, with respect to potential temporary noise and air quality impacts, Measures AQ-1, AQ-2, AQ-3, AQ-4, AQ-5, N-1, and N-2 are stipulated as also being specifically applicable while construction activities are occurring in close proximity to Grand Terrace Fitness Park.

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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 First-Cut Screening

The potential growth-related impacts of the Project were considered in the context of the first-cut screening analysis approach to assess the likely growth potential effect of the Project and whether further analysis is necessary, based on consideration of the following:

- How, if at all, does the proposed project potentially change accessibility?
- How, if at all, do the project type, project location, and growth pressure potentially influence growth? Some transportation projects may have very little influence on future growth, whereas other may have a great influence. Some geographic locations are more conducive to influencing growth, whereas others are highly constrained. These differences may result from physical constraints, planning and zoning factors, or local political considerations.
- 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.
- If there is project-related growth, how, if at all, will it impact resources of concern? Identify which resources of concern are likely to be affected by the foreseeable future growth. If a project is likely to influence future growth, but no

resources of concern will be affected, then state so here and indicate that no further growth analysis is warranted.

The potential for the Project to influence growth based on these considerations is described below.

2.2.2.1 Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Separately, the Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The No Build Alternative would not result in growth-related impacts.

2.2.2.2 Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

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

The Project would reduce traffic congestion in the Project area, resulting in better operation of the existing interchange and local circulation. In addition, the Project would alleviate existing deficiencies and accommodate projected future (2040) traffic volumes in the traffic study area, consistent with adopted local land use and transportation plans (refer to Section 2.1, Land Use). While the Project includes reconstruction of an existing interchange, it would not provide new transportation facilities or create new access points to areas previously not accessible. Therefore, the Project would not result in changes in accessibility to the transportation system in this area.

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

The I-215/Barton Road interchange is the main access to the City of Grand Terrace and provides an alternative access to the eastern portion of the City of Colton (in addition to the I-215/Mount Vernon/Washington Street interchange). The City of Grand Terrace's Barton Road Specific Plan provides guidance for the development of primarily commercial property along this transportation corridor.

The Project would accommodate approved and planned growth in the area (refer to Table 2.1.A, Planned Projects) because it would add capacity at the interchange,

thereby reducing congestion in this 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 City of Grand Terrace and the City of Colton is expected to occur with or without the Project. As an interchange improvement, the Project may make growth in the area more attractive; however, as seen in Table 2.1.A (Section 2.1, Land Use), a substantial number of development projects were proposed and approved prior to the initiation of the interchange Project, which indicates that development in the area is not dependent on completion of the interchange improvements. As of August 2012, the Pellissier Ranch Specific Plan has been suspended indefinitely. This area will be studied further to make sure that existing hillsides are preserved.[1] Besides the projects identified in Table 2.1.A, there are not a substantial number of acres available in the study area for new development. Therefore, although the Project would accommodate existing and planned growth, it 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 Project would not influence growth beyond what is currently planned (refer to Table 2.1.A) and would not change the rate, type, or amount of growth. Therefore, there is no Project-related growth.

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

As discussed above, because the Project would not change the rate, type, or amount of growth, the reasonably foreseeable growth in the Cities of Grand Terrace and Colton is not Project-related.

Based on this "First Cut Screening" analysis, no further analysis is required.

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[1] Mark Tomich, City of Colton, Personal Communication, August 28, 2012, and City of Colton Staff Report: *General Plan Amendment: Resolutions Adopting an Environmental Impact Report and Comprehensive Updates to the Land Use Element, Housing Element, and Circulation ("Mobility") Element of the Generl Plan (file idex no. DAP-001-101); Resolution providing follow-up direction to staff*. August 20, 2013.

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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) (November 2013). The study area for community character and cohesion is the community within and surrounding the Project area in which the direct impacts and the indirect impacts of the Project may occur. For this Project, the study area includes the neighborhoods located within and adjacent to the Project design footprint. Community Profile data are collected and organized by city, county, and census tract; therefore, these boundaries are utilized in conjunction with evaluating impacts to the affected environment within the study area.

Data presented in this section is based on the census tracts from the 2010 Census and the 2007–2011 American Community Survey (ACS).[1] Existing data from the 2010

[1] The ACS is an ongoing survey conducted by the United States (U.S.) Census Bureau that provides data every year, giving communities the current information they need to plan investments and services. Information from the survey generates data that help determine how more than $400

Census include the demographics of larger clusters and metropolitan areas, such as counties and large cities; however, information regarding communities and census tracts is also available at the ACS level. The main differences between the 2010 Census and the ACS 2007–2011 surveys are in the sample sizes and in the periods of time in which the samples were taken. Whereas the 2010 Census covers all households and residents and provides general demographic characteristics, the ACS is sample-derived data, and provides detailed information on all levels, including census tracts. The study area includes data from the 2007–2011 ACS and Census 2010 (Census Tracts 71.06, 71.07, 71.09, and 71.10). Census tracts were used because they are the most complete data set for the level of detail required for this analysis. Data boundaries with a finer level of detail, such as census blocks, were not used due to incomplete data in some of the required demographic categories necessary for analysis. Detailed information concerning the affected environment is provided for these census tracts where appropriate. For context and comparison, information is also provided at city and county levels for certain topics.

The Project area is characterized by a mix of residential, commercial, and public uses, with commercial development surrounding the interchange. Existing uses in the northeast quadrant of the interchange include Grand Terrace Elementary School, a few small businesses, and single-family residential properties. The current land uses in the northwest quadrant consist of a few single-family residences, a recreational vehicle (RV) park (Terrace Village RV Park), two mobile home parks (Grand Terrace Mobile Home Park and Grand Royal Mobile Estates), two strip malls, a restaurant (Demetri's Burgers), and an office complex. Existing uses in the southwest quadrant include small businesses, bus storage, industrial businesses, office buildings, and retail stores.

Community cohesion is the degree to which residents have a sense of belonging to their neighborhood; their level of commitment to the community; and/or a strong attachment to neighbors, groups, and institutions, usually as a result of continued association over time. Community cohesion can be discussed in the context of specific indicators. These include:

- Ethnicity: Ethnic homogeneity is associated with a higher degree of community cohesion.

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billion in federal and State funds are distributed each year (source: http://www.census.gov/acs/www/about_the_survey/american_community_survey/).

- Household Size: Households of two or more people tend to correlate with a higher degree of community cohesion.
- Housing Tenure: Households that have been part of a community for a longer period of time tend to correlate with a higher degree of community cohesion.
- Age: Communities with a high percentage of elderly residents tend to correlate with a higher degree of community cohesion.

These indicators of community cohesion in the study area and the applicable local jurisdiction are described in more detail below.

Ethnicity

Table 2.3.A shows the racial and ethnic demographics of the population of Grand Terrace and Colton (Cities), San Bernardino County (County), and the study area census tracts. The study area census tracts are shown in Figure 2.3.1.

Table 2.3.A Racial and Ethnic Demographics

Jurisdiction	White	Black	American Indian/ Native Alaskan	Asian	Hawaiian/ Pacific Islanders	Other and Two or More Races	Hispanics
County of San Bernardino	1,153,161 (57%)	181,862 (9%)	22,689 (1%)	128,603 (6%)	6,870 (0.3%)	542,025 (27%)	1,001,145 (49%)
City of Grand Terrace	7,912 (66%)	673 (6%)	120 (1%)	778 (7%)	32 (0.3%)	2,525 (21%)	4,708 (39%)
City of Colton	22,613 (43%)	5,055 (10%)	661 (1%)	2,590 (5%)	176 (0.3%)	21,059 (40%)	37,039 (71%)
Census Tract 71.06 (City of Grand Terrace and City of Colton)	2,523 (64%)	223 (6%)	28 (0.7%)	220 (6%)	16 (0.4%)	933 (24%)	1,616 (41%)
Census Tract 71.07 (City of Grand Terrace and City of Colton)	1,442 (44%)	695 (21%)	39 (1%)	93 (3%)	10 (0.3%)	1,023 (31%)	1,738 (53%)
Census Tract 71.09 (City of Grand Terrace and City of Colton)	2,971 (49%)	1,132 (19%)	67 (1%)	374 (6%)	26 (0.4%)	1,494 (25%)	2,340 (39%)
Census Tract 71.10 (City of Colton and City of San Bernardino)	2,146 (44%)	411 (9%)	26 (0.5%)	1,112 (23%)	14 (0.3%)	1,122 (23%)	1,899 (39%)

Source: U.S. Census Bureau, 2010 Census, Table SF1 DP1.
Note: Percentages do not add up to 100 percent because Hispanics (as an ethnicity), as counted by the Census, may be of any race.

As shown in Table 2.3.A, the racial composition of the study area census tracts, the Cities, and the County varies. In the City of Grand Terrace, the population is predominantly White (66 percent), higher than the County average of 57 percent, whereas the City of Colton's White population percentage (43 percent) is lower than the County's average, but Whites are still the largest racial group in that city.

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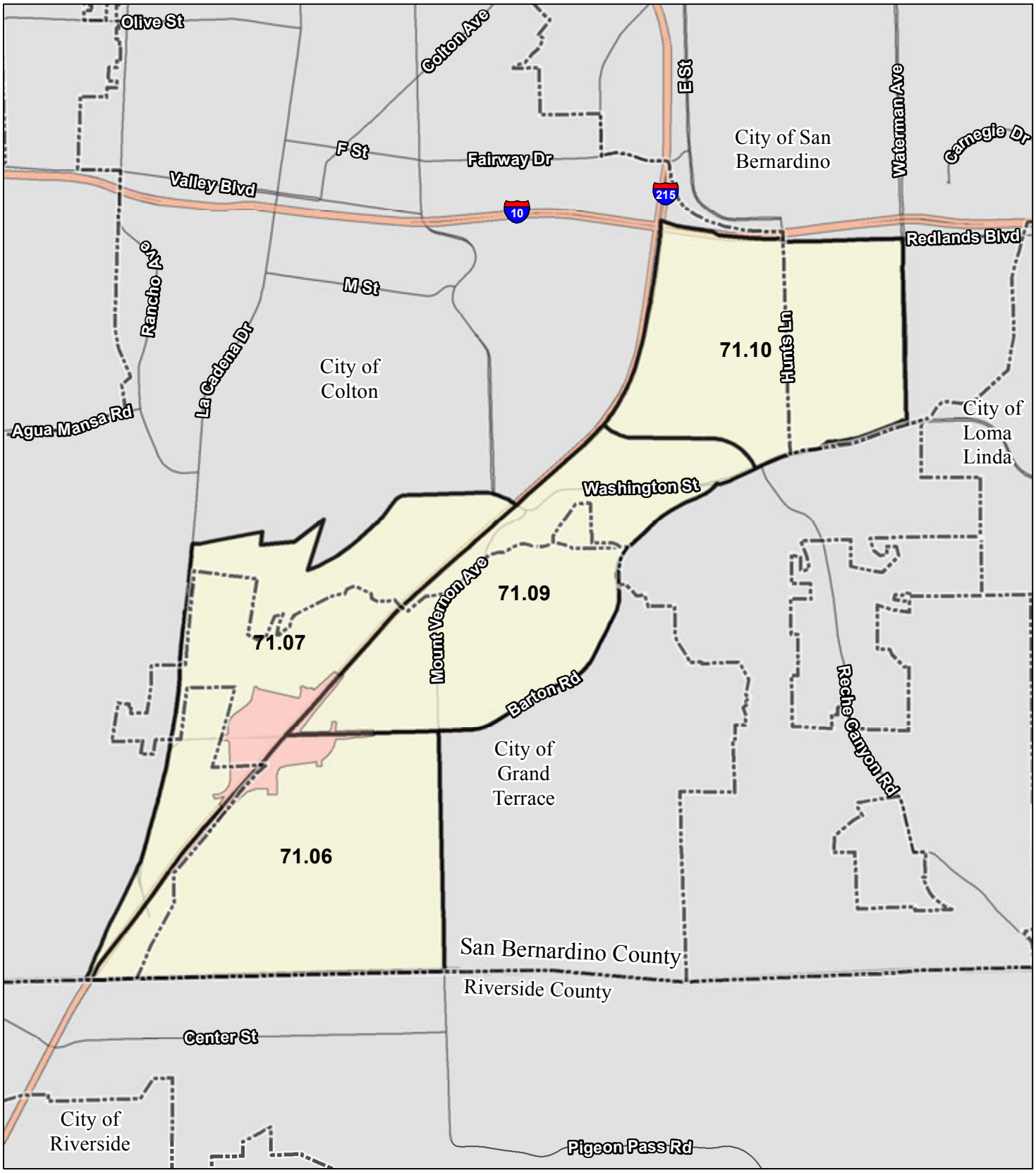

LEGEND

- Project Area
- Study Area Census Tracts
- City Boundary

N

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FEET

SOURCE: ESRI (2008); US Census Bureau (2010)

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FIGURE 2.3.1

I-215 Barton Road Interchange Improvement Project

Census Tracts

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The White population percentage in Census Tract 71.06 is similar to that of the City of Grand Terrace, while the other census tracts' White population percentage is similar to that of the City of Colton. The Black population percentage in Census Tracts 71.07 and 71.09 is approximately twice that of the other census tracts, the cities, and the County. All jurisdictions have similar percentages of individuals of two or more races. There is a relatively high percentage (23 percent) of Asians in Census Tract 71.10.

The County and the study area Cities each contain substantial Hispanic populations, with the largest percentage (71 percent) in the City of Colton. Although all four study area census tracts contain substantial Hispanic populations, only Census Tract 71.07 contains a higher percentage of Hispanics (53 percent) than the County overall (49 percent). The other census tracts' Hispanic population percentages range from 39 to 41 percent. Hispanics can be of one or more races.

Grand Terrace Elementary School is located adjacent to the I-215/Barton Road interchange. The percentage of minority students enrolled in the school is similar to the study area census tracts statistics. The percentage of Hispanics students is larger than the overall percentage of Hispanics in the study area. Specifically, based on the School Enrollment by Ethnicity for 2011-12 for Grand Terrace Elementary School, the percentage of racial minority students (Black, Asian, American Indian, Pacific Islander) is 11 percent, with 70 percent of the students enrolled being Hispanic. The total percentage of minority students in the school follows the demographic trends of the City of Grand Terrace minority populations. However, the percentage of Hispanics students is larger than the percentage of Hispanics in the City of Grand Terrace and the County.

Household Size

According to the 2007-2011 ACS and the 2010 Census, as shown in Table 2.3.F, the typical household size in the County is 3.3 persons, similar to the City of Colton household size (3.7 persons) and higher than the City of Grand Terrace household size (2.8 persons). Most of the census tracts have fairly uniform household sizes with Census Tract 71.06 at 2.9 persons per household, Census Tract 71.07 at 2.7 persons per household, Census Tract 71.09 at 2.7 persons per household, which are less than the County's household size. Census Tract 71.10 has an average of 3.7 persons per household.

Housing Tenure

Table 2.3.B provides data on how long homeowners have been residing in their units, grouped into five- and ten-year intervals, for the study area census tracts, the study area Cities, and the County. With the exception of Census Tract 71.10, the largest group of the population in all the geographic units has lived in their residence less than 10 years. The majority of those living in Census Tract 71.10 (34 percent) moved in between 1990 and 1999. The second highest percentage, with the exception of Census Tract 71.10, falls within the 2000-2004 interval. When combined with those who moved in after 2005, the majority of the population within or near the Project area has lived in their current residence less than 15 years.

Table 2.3.B Housing Tenure

Area	Year Householder Moved Into Unit					
	2005 or later	2000–2004	1990–1999	1980–1989	1970–1979	1969 or earlier
County of San Bernardino	252,152 (42.1%)	137,833 (23.0%)	118,133 (19.7%)	52,473 (8.8%)	24,181 (4.0%)	14,050 (2.3%)
City of Grand Terrace	1,745 (39.2%)	999 (22.5%)	821 (18.5%)	528 (11.9%)	248 (5.6%)	108 (2.4%)
City of Colton	6,598 (43.8%)	3,223 (21.4%)	2,733 (18.1%)	1,181 (7.8%)	504 (3.3%)	837 (5.6%)
Census Tract 71.06 (City of Grand Terrace and City of Colton)	663 (44.8%)	252 (17.0%)	232 (15.7%)	152 (10.3%)	116 (7.8%)	65 (4.4%)
Census Tract 71.07 (City of Grand Terrace and City of Colton)	499 (45.9%)	311 (28.6%)	183 (16.8%)	76 (7.0%)	9 (0.8%)	9 (0.8%)
Census Tract 71.09 (City of Grand Terrace and City of Colton)	1,640 (68.9%)	372 (15.6%)	242 (10.2%)	67 (2.8%)	35 (1.5%)	25 (1.0%)
Census Tract 71.10 (City of Colton and City of San Bernardino)	468 (30.7%)	356 (23.3%)	520 (34.1%)	181 (11.9%)	0 (0.0%)	0 (0.0%)

Source: U.S. Census Bureau, ACS 2007–2011, Table DP04.

Based on the data provided in the 2007–2011 ACS, three of the study area census tracts, the Cities, and the County do not show a long-term housing tenure (i.e., a substantial majority living in their current residence prior to 2000). The longest-term housing tenure is represented by Census Tract 71.10 because it has the highest percentage of residents that have occupied their residences for 11 years or more.

Housing Occupancy

Table 2.3.C shows the occupied housing units and the percentage of owner- and renter-occupied housing units within the study area census tracts, the study area Cities, and the County. The homeownership rate in the City of Grand Terrace is

Table 2.3.C Housing Occupancy

	San Bernardino County	City of Grand Terrace	City of Colton	Census Tract 71.06	Census Tract 71.07	Census Tract 71.09	Census Tract 71.10
Occupied Housing Units	598,822	4,449	15,076	1,480	1,087	2,381	1,525
Owner-occupied	384,624 (64.2%)	2,869 (64.5%)	8,302 (55.1%)	953 (64.4%)	523 (48.1%)	639 (26.8%)	1,202 (78.8%)
Renter-occupied	214,198 (35.8%)	1,580 (35.5%)	6,774 (44.9%)	527 (35.6%)	564 (51.9%)	1,742 (73.2%)	323 (21.2%)

Source: U.S. Census Bureau, 2007–2011 ACS, Table DP04.

similar to that of the County – 64.5 percent of Grand Terrace residents own their homes, which is close to the County's percentage of 64.2.

In the City of Colton, the homeownership rate of 55.1 percent is much lower than the County. With respect to the residents closest to the Project, the numbers vary substantially. In the census tracts directly adjacent to the Project, Census Tracts 71.06, 71.07, and 71.09, the percentage of residents who own their homes is much lower. Although the homeownership percentage in Census Tract 71.06 is similar to that of the County and of Grand Terrace, the percentages in Tracts 71.07 and 71.09, where most of the Project is located, are 48.1 percent and 26.8 percent, respectively.

Age Distribution

The age distribution, including the median age, of the population in the study area Cities and census tracts is shown in Table 2.3.D. The age distribution patterns across the age groups of the studied census tracts, the Cities, and the County are similar. The Cities and affected census tracts reported similar percentages of population between18 and 64. The percentage of the population over age 64 in the study area census tracts ranges between 5 to 11 percent, and is lower than the City of Grand Terrace. The percentages of the population under age 18 in the study area census tracts are also substantially the same and slightly below the percentages in the City of Colton and the County, with exception of Census Tract 71.07, which has a higher population under 18.

Community Cohesion Summary

Some indicators that a community has a high degree of cohesion include a substantial presence of residents with long tenure, households of two or more people, high rates of homeownership, racial and/or ethnic homogeneity, and a high percentage of elderly residents. The Project is primarily within the City of Grand Terrace and only a small portion is within the City of Colton.

Table 2.3.D Age Distribution

Jurisdiction	Median Age	Percent		
		Population < 18	Population 18–64	Population > 64
County of San Bernardino	32	33	58	9
City of Grand Terrace	36	26	62	12
City of Colton	28	35	57	8
Census Tract 71.06 (City of Grand Terrace and City of Colton)	34	27	62	11
Census Tract 71.07 (City of Grand Terrace and City of Colton)	26	37	58	5
Census Tract 71.09 (City of Grand Terrace and City of Colton)	30	28	63	9
Census Tract 71.10 (City of Colton and City of San Bernardino)	34	30	62	8

Source: U.S. Census Bureau, 2010 Census, Table SF1 DP1.

Residents who have lived in the same location for many years typically have a strong attachment to their neighborhood as a result of continued association with their neighbors and local groups and institutions over time. The percentages of the population that moved into their current residences in 2000 or later are 62 percent in the City of Grand Terrace and 65 percent in the City of Colton. These numbers are similar to the percent of County residents (65 percent) who moved into their current residences in 2000 or later. In addition, approximately 18 percent of the residents in the City of Grand Terrace and the City of Colton moved into their current residences between 1990 and 1999. By comparison, approximately 20 percent of the County's residents moved into their current residences between 1990 and 1999. Only 20 percent of the population in the City of Grand Terrace and 17 percent of the population in the City of Colton moved into their current residence prior to 1990, which is higher than the County (15 percent). Because neither of the study area cities nor any of the study area census tracts contain a substantial majority of long-term residents, as shown in Table 2.3.B, the area does not display a high level of community cohesion.

Elderly residents include retirees (65 years of age and older), who typically have more time to engage in neighborhood groups and volunteer in their communities than the working age population, and if long-tenured in the community, often have a greater social connection with the community. The City of Grand Terrace is a predominantly White community characterized by smaller household sizes (2.8 persons per household) than the County as a whole (3.3 persons per household). The percentage of residents 65 years of age or older (12 percent) in the City of Grand Terrace is relatively low compared to the population between the ages of 18 and 64

(62 percent), and the median age of 36 years is only slightly higher than the median age in the County (32 years). The City of Colton has a younger and more ethnically diverse population, and is characterized by a higher number of persons per household (3.7) than the population of the County as a whole. The median age for residents in the City of Colton is 28 years. As no part of the study area, in either city, hosts a high percentage of elderly residents, and both exhibit a relatively young median age, as evidenced by the data in Table 2.3.D, this indicator for potentially high community cohesion is considered to be predominantly absent.

Another indicator of community cohesion is a high rate of homeownership. The homeownership rate in the City of Grand Terrace is similar to that of the County – 64.5 percent of Grand Terrace residents own their home, which is close to the County's percentage of 64.2. In the City of Colton, the homeownership rate of 55.1 percent is much lower than the County. When we look at the residents closest to the Project, the numbers vary substantially. The homeownership rate in the census tracts directly adjacent to the Project, Census Tracts 71.06, 71.07, and 71.09, the percentage of residents who own their homes is much lower. Although the percentage in Census Tract 71.06 is similar to that of the County and of Grand Terrace, the percentages in Tracts 71.07 and 71.09, where most of the Project is located, are 48.1 percent and 26.8 percent, respectively. Accordingly, as evidenced by the aforementioned data, most of the Project area is located in census tracts with a substantially lower rate of homeownership.

In general, indicator values for Census Tract 71.06 are similar to the City of Grand Terrace's cohesion indicator values, while the remaining census tracts reflect the cohesion indicator values in the City of Colton. Based on these indicators, separate from ethnic homogeneity as evidenced by the 66 percent White population in the City of Grand Terrace and 64 percent in Census Tract 71.06, overall the Project area does not evidence a particularly pronounced degree of community cohesion.

Other Demographics

Employment

Table 2.3.E shows employment percentages by economic sectors for the Cities and the County. According to the 2007–2011 ACS, education, health, and social services, and retail were the largest and second largest County industry sectors in terms of employment, comprising approximately 22 and 13 percent, respectively, of the total employed labor force in the County, with manufacturing following at approximately 10 percent. Education, health, and social services was also the largest industry sector

Table 2.3.E Employment Percentages

Economic Sector	City of Grand Terrace	City of Colton	San Bernardino County
Construction	8%	9%	8%
Manufacturing	8%	11%	10%
Retail	13%	13%	13%
Finance and Insurance	5%	4%	6%
Professional and Technical Services	10%	9%	8%
Education, Health, and Social Services	23%	21%	22%
Lodging and Foodservice	7%	9%	9%
All Other Sectors	26%	24%	24%

Source: U.S. Census Bureau, 2007–2011 ACS, Table DP03.

in Grand Terrace and Colton, at 23 and 21 percent, respectively, of the employed labor force in the respective Cities, followed by retail at approximately 13 percent in both cities.

The 2007–2011 ACS found that there were 949,657 persons in the County of San Bernardino civilian labor force. According to the California Employment Development Department, the unemployment rate in the County of San Bernardino was 11 percent as of April 2013. At that time, the Cities of Grand Terrace and Colton had a higher percentage of employed civilians, and the City of Grand Terrace had slightly lower unemployment rates than the County. According to the California Employment Development Department, as of June 2013, the unemployment rate in the City of Grand Terrace was 5.3 percent, while the unemployment rate in Colton was 11.2 percent, indicating that the local economy is consistent with the national economic downturn.

Table 2.3.F provides other demographic characteristics for the Cities and County, as reported in the 2007–2011 ACS and 2010 Census. As seen in Table 2.3.F, all study area census tracts (with exception of Census Tract 71.07) have a slightly higher percentage of employed labor force than the respective Cities and the County, with Census Tract 71.09 having the highest percentage of employed civilians at 68 percent. Census Tract 71.07 reported the lowest percentage of employment civilians at 48 percent.

Income and Poverty Status

There are two slightly different versions of how the federal government measures poverty: Poverty thresholds and poverty guidelines. Poverty thresholds are the original version of the federal poverty measure, originally developed by the Social Security Administration, used mainly for statistical purposes – to estimate the number

Table 2.3.F Local, County, Regional, and State Demographic Summaries

Jurisdiction	Total Population[1]	Median Household Income[2]	Persons below Poverty[2]	High School Graduate or Higher (over Age 25)[2]	College Graduate or Higher (over Age 25)[2]	Employed Civilian Labor Force[2]	Persons Per Household[1]
County of San Bernardino	2,035,210	$55,853	16%	79%	18%	54%	3.3
City of Grand Terrace	12,040	$64,337	6%	89%	23%	62%	2.7
City of Colton	52,154	$41,788	22%	69%	13%	56%	3.5
Census Tract 71.06 (City of Grand Terrace and City of Colton)	3,943	$68,446	10%	86%	28%	64%	2.9
Census Tract 71.07 (City of Grand Terrace and City of Colton)	3,302	$32,637	39%	79%	5%	48%	2.9
Census Tract 71.09 (City of Grand Terrace and City of Colton)	6,064	$38,684	18%	87%	24%	68%	2.5
Census Tract 71.10 (City of Colton and City of San Bernardino)	4,831	$81,206	4%	89%	30%	64%	3.3

Source: U.S. Census Bureau, 2007–2011, 2010 Census.
Note: Persons living in the poverty percentile, which is based on U.S. Census Bureau thresholds, not United States Department of Health and Human Services guidelines. For 2010, the poverty threshold for a family of four was $22,314.
[1] From 2010 Census, Table SF1 DP1.
[2] From 2007–2011 ACS, Tables DP02 and DP03.

of Americans living in poverty. Poverty guidelines on the other hand are used for administrative purposes, namely to determine financial eligibility for certain federal programs.[1] Poverty thresholds are updated every year by the Census Bureau and estimates provided through ACS reports. The official poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index. To determine the income and poverty characteristics for the study area, data were obtained from the 2007–2011 ACS for the County, the Cities, and the census tracts. Table 2.3.F provides income and poverty level characteristics for the census tracts, Cities, and County, as reported in the 2007–2011 ACS and the 2010 Census. The poverty level is defined annually by the United States Department of Health and Human Services, and was $22,050 for a family of four in 2010. For 2010, the poverty threshold used by the U.S. Census Bureau for a family of four was $22,314.

As shown in Table 2.3.F, the City of Grand Terrace is characterized by more affluent residents, with a higher median household income and fewer persons living below the

[1] http://www.census.gov/hhes/www/poverty/methods/definitions.html

poverty level than the City of Colton and County averages. The study area census tracts' median income ranges between $32,637 (below the median for the Cities) and $81,206 (above the Cities of Colton, Grand Terrace, and County of San Bernardino medians). In the study area census tracts, Census Tract 71.10 has the fewest residents living below the poverty level, while Census Tract 71.07 has the highest percentage of residents living below the poverty level. Census Tract 71.10 has the highest median household income compared to other census tracts, the Cities, and the County averages. Census Tract 71.07 reported the lowest median household income and the highest percentage of individuals (39 percent) living below the poverty level compared to the averages for the other study area census tracts, the Cities, and the County.

Commuter Travel

I-215 passes through the western part of the City of Grand Terrace in a generally northeast-southwest direction. Table 2.3.G summarizes commuter travel patterns within the study area census tracts, the Cities, and the County based on the 2007–2011 ACS.

As shown in Table 2.3.G, the majority of residents in the Cities of Grand Terrace and Colton, the County, and the study area census tracts work in the County. However, most study area residents work in a different city than their city of residence. Approximately 74 percent of all study area census tract residents have an average commute time of less than 30 minutes, while approximately 13 percent have an average commute of 30 to 44 minutes. The data indicates that this 13 percent of study area residents commute to cities outside of the study area for employment.

Since the Barton Road interchange is a primary access to the I-215 in the City of Grand Terrace, it is a key feature for commuters to utilize to travel to work between cities and counties.

The existing I-215/Barton Road interchange provides regional access to the City of Grand Terrace, with secondary access available at La Cadena Drive. According to the City of Grand Terrace General Plan, Circulation Element, Barton Road is the principal major highway in the City. It provides direct access to the commercial corridor that runs along its length through the City of Grand Terrace. Barton Road currently provides two lanes of travel within 80 ft of right-of-way and one lane of travel in each direction on the Barton Road overcrossing, with sidewalk on one side

Table 2.3.G Commuter Travel

	San Bernardino County	City of Grand Terrace	City of Colton	Census Tract 71.06	Census Tract 71.07	Census Tract 71.09	Census Tract 71.10
Work in County of Residence	562,603 (71%)	4,052 (69%)	14,399 (71%)	1,276 (63%)	786 (77%)	2,022 (65%)	1,776 (70%)
Work Outside County of Residence	234,575 (29%)	1,813 (31%)	5,837 (29%)	740 (37%)	241 (23%)	1,090 (35%)	751 (30%)
Work in City of Residence	205,539 (27%)	435 (7%)	3,128 (15%)	140 (7%)	244 (24%)	241 (8%)	392 (16%)
Work Outside City of Residence	551,758 (73%)	5,448 (93%)	17,137 (85%)	1,883 (93%)	783 (76%)	2,886 (92%)	2,135 (84%)
Travel Time to Work							
< 30 minutes	60%	73%	70%	78%	70%	73%	76%
30–44 minutes	18%	12%	15%	14%	13%	13%	13%
45–59 minutes	8%	4%	4%	2%	5%	6%	6%
> 60 minutes	14%	11%	11%	6%	12%	9%	5%

Source: U.S. Census Bureau, 2007–2011 ACS, Tables B08007, B08008, and B08303.

and no bicycle lanes. Barton Road presently has a continuous left-turn lane in the eastern part of the City. The City of Grand Terrace General Plan Circulation Element(2010) plans for Barton Road to provide four lanes within 100 ft of right-of-way, with sidewalk and bicycle lanes on both sides.

The Cities of Grand Terrace and Colton depend on the distribution of jobs within and outside their borders. Both Cities share Barton Road and La Cadena Drive and both utilize the I-215/Barton Road interchange. The I-215/Barton Road interchange is considered the main access point to the relatively small City of Grand Terrace; the City of Colton is large and has several major access points to the regional freeway system along I-10 and I-215.

2.3.1.3 Environmental Consequences

Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, the No Build Alternative would not result in temporary impacts to community character and cohesion.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Construction activities associated with implementation of the Project would result in temporary impacts to residences and businesses adjacent to the I-215/Barton Road interchange, including construction equipment noise and emissions, access restrictions, and detours.

Road detours would result in some traffic delays for local residents, businesses, and commuters. However, continuous access for uses adjacent to the Project area would be provided and therefore no substantial disruptions to the local community are anticipated. During final design, a TMP will be prepared in order to address potential detours.

Appropriate detour signage would be developed for the Project. Extensive ramp closures are not anticipated; however, travel times could temporarily increase due to the closure of lanes. During ramp closures at Barton Road, the I-215/Iowa Avenue/La Cadena Drive and I-215/Mount Vernon Avenue-Washington Street interchanges would be available as alternate access points to and from I-215. La Cadena Drive and Mount Vernon Avenue would provide north-south access to Barton Road in the Project vicinity.

Construction impacts would be minimized through compliance with California Department of Transportation (Caltrans) standards for noise, emissions, and temporary construction easements (TCEs), and the City of Grand Terrace and City of Colton standards for construction noise (for work within local jurisdictional boundaries), as well as implementation of a comprehensive TMP and public outreach program. No substantial impacts are anticipated.

The number of potential construction jobs created by a project is based on total construction costs. Alternative 3 is the most expensive (Table 1.J); this alternative would generate an estimated 1,364 construction jobs. Alternative 6 would generate an estimated 822 construction jobs. Modified Alternative 7 would generate an estimated 812 construction jobs. The above estimated construction jobs for the three respective Build Alternatives would generate temporary employment and revenue for both the local and regional economies.[1]

Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, the No Build Alternative would not result in permanent impacts to community character and cohesion.

Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project does not include changes to local circulation and would not displace residents or businesses; therefore no community character or cohesion impacts would occur. However, congestion in the I-215/Barton Road interchange area would increase. The I-215 Bi-County HOV Lane Gap Closure Project will construct two sound barriers that will separate Grand Terrace Elementary School and the Grand Royal Mobile Estates from I-215. This is considered a beneficial impact.

Alternative 3 (Partial Cloverleaf Interchange)

Alternative 3 would require the full acquisition of 8 single-family dwellings that are interspersed in a commercial area. Residents living in properties adjacent to I-215 that would be acquired would have an opportunity to relocate to other residential areas away from a freeway. Due to the fragmented nature of the residential community, and

[1] Employment impacts vary over time. Based on the latest data provided by FHWA, $1 billion in investments supports approximately 13,000 construction jobs, with approximately 50 percent each for direct and indirect jobs. http://www.fhwa.dot.gov/policy/otps/pubs/impacts/index.htm (April 5, 2012).

the limited cohesion indicated by the existing demographic profile, the residential acquisitions under Alternative 3 would not divide an existing neighborhood or fragment a cohesive neighborhood.

Alternative 3 would result in 31 business displacements. The businesses that would be displaced are listed by business name, based on a review by City of Grand Terrace staff, and are shown in Table 2.3.H.

Table 2.3.H Alternative 3 Business Displacements

Business Name	Type of Business	Service Area	City
Genesis Hair	Hair Salon	Local	Grand Terrace
All TV VCR	Electronics Repair	Local/Regional	Grand Terrace
Empire Cash Register	Cash Register Sales and Repair	Regional	Grand Terrace
Animal Emergency Clinic	Pet Clinic	Local/Regional	Grand Terrace
Diane Johnson (enrolled agent)	Taxes	Local	Grand Terrace
Auto Diagnostic Service aka Automotive Network Solutions	Auto Repair	Local	Grand Terrace
The Paragon Tattoo and Gallery	Tattoo	Local	Grand Terrace
Soft Touch Poodle Palace	Pet Grooming	Local	Grand Terrace
Mori Hokana Smile Solutions	Dental Lab	Local/Regional	Grand Terrace
Vintage Boutique	Clothing Sales	Local	Grand Terrace
The Rec Center	Business Services	Local	Grand Terrace
Terra Loma Real Estate, Inc.	Real Estate	Local/Regional	Grand Terrace
Ornell Fire Sprinklers	Sprinklers	Local/Regional	Grand Terrace
Financial Solutions	Financial Planning/Taxes	Local\Regional	Grand Terrace
Demetri's Burgers	Restaurant	Local	Grand Terrace
On Point Tax Services	Taxes	Local\Regional	Grand Terrace
PDS Transportation	Freight moving company	Regional	Grand Terrace
Loan Savings/American Professional Group	Loans	Local\Regional	Grand Terrace
Shell Station aka Keromina Market Place/Circle K Convenience Store	Gas station and food mart	Local	Grand Terrace
Auto Zone	Auto Parts and Accessories	Local	Grand Terrace
Blue Mountain Collision Center	Auto Repair/Restoration	Local	Colton
WinBath & Kitchen Showroom/ DarCrest Vehicle Storage	Bath and Kitchen Furniture Sales/Vehicle Storage	Local/Regional	Colton
Orkin	Pest Control Services	Local/Regional	Colton
Hose-Man	Hydraulic/Industrial Hose Sales and Service	Local/Regional	Colton
Cal Skate	Recreation	Local\Regional	Grand Terrace
Quick Stop (Arco Station)	Gas Station and food mart	Local	Grand Terrace
Roblee's Carpet & Flooring	Tile and carpet sales, carpet cleaning	Local	Grand Terrace
Superior Pool Products	Wholesale distributor of swimming pool supplies	Regional	Grand Terrace
Winnelson Wholesale Plumbing	Wholesale plumbing	Regional	Grand Terrace
Essco	Wholesale Electric	Regional	Grand Terrace
Miguel's Jr.	Restaurant	Local	Grand Terrace

Source: Email from Richard Shields, City of Grand Terrace Public Works Director (June 11, 2013).

Based on communication with City of Grand Terrace staff, it was determined that many businesses to be displaced under Alternative 3 cater to local as well as regional

clientele; however, there are several that likely serve mostly local clientele.[1] For purposes of this table, "local" refers to the surrounding neighborhood, as well as adjacent communities such as Highgrove (less than a 2-mile [mi] radius from the Project area), and "regional" would generally be areas north of I-10, west of the Santa Ana River, east of the Grand Terrace city boundary and south of the Highgrove community. Businesses catering to regional clientele and pass-through traffic, such as the gasoline stations, are typically less affected by relocation than those that serve only local clientele that has been built up over many years.

Furthermore, as detailed on the City of Grand Terrace's website, there are 9 registered auto-repair-related businesses, 1 pet grooming service, 7 tax companies, 13 beauty and hair salons, 3 dental labs, and 12 restaurants within a 2 mi radius of the interchange. In addition, as of August 2013, an internet search found 9 pet clinics within a 5 mi radius of the interchange, and 2 tattoo studios are located within approximately 5 mi. However, regarding the pet clinics within 5 mi of the interchange, these facilities are generally not open after 6:00 p.m. on weekdays and are not open 24 hours per day on weekends and holidays like the Animal Emergency Clinic, although some of them have an emergency contact number. The next closest emergency pet clinic is located in Upland, just north of I-10, approximately 22 mi from the interchange. While the neighborhood residents do not depend on most of the businesses to be displaced for essential goods and services, the outcome regarding the Animal Emergency Clinic may result in animal emergencies needing to be handled by on-call veterinarians or by the emergency clinic in Upland. Considered as a whole, it is not expected that displacements under Alternative 3 would result in substantial impacts to neighborhoods. In addition, based on the *Draft Relocation Impact Statement* (DRIS) results, there are replacement properties available within the City of Grand Terrace that could accommodate relocated businesses. The City of Grand Terrace has indicated that it would prefer to have the impacted buisnesses needing relocation to be relocated within the city limits. Additional replacement properties are available in the City of Colton. Refer to Section 2.3.3 Relocations and Real Property Acquisitions.

The sound barriers that will be constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project adjacent to Grand Terrace Elementary School along the northbound I-215 on-ramp and adjacent to the Grand Royal Mobile Estates will

[1] Telephone conversation with Sandra Molina, Planning Department, City of Grand Terrace (August 23, 2012).

reduce traffic noise associated with the Build Alternatives. The I-215 Bi-County HOV Lane Gap Closure Project sound barriers are anticipated to be completed by late 2014.

A portion of the sound barrier that will be constructed adjacent to the Grand Royal Mobile Estates as part of the I-215 Bi-County HOV Lane Gap Closure Project would be removed (approximately 650 feet [ft] of the barrier) to allow for reconstruction of the I-215 southbound off-ramp and the new southbound loop on-ramp that are part of Alternative 3. The removed portion of the sound barrier would be reconstructed along the State right of way line proposed in conjunction with Build Alternative 3.

As discussed in Section 2.13, Noise, other sound barriers were modeled for Alternative 3. Only the sound barriers that met the Caltrans *Traffic Noise Analysis Protocol for New Highway Construction Reconstruction Projects* (May 2011) (Noise Protocol) requirements and that are not already included as part of the I-215 Bi-County HOV Lane Gap Closure Project are proposed for each Build Alternative. For Alternative 3, no additional sound barriers are proposed.

As shown in Figure 1.5, local streets in the neighborhoods would be modified, which would change the circulation pattern in these areas. For instance, on the west side of I-215, a new east-west road would be constructed between Grand Terrace Mobile Home Park and the single-family residential area that connects to Vivienda Avenue and Grand Terrace Road. This would provide an alternative route to this area, since La Crosse Avenue in the northwest quadrant would be removed as a result of the new southbound I-215 freeway ramps. In addition, Grand Terrace Road would be realigned and would connect with the extension of De Berry Street at Barton Road. This would provide an alternative route to this area, since La Crosse Avenue in the southwest quadrant would be removed as a result of the new southbound I-215 freeway on-ramp. Because the circulation changes would maintain access to area properties, no substantial circulation impacts would occur.

Alternative 3 would improve operations and levels of service (LOS) at the interchange. Bicycle lanes and sidewalks would be constructed consistent with the City of Grand Terrace Circulation Element (2010).

Traffic noise level increases would be minimal and will be reduced adjacent to sensitive receptors through construction of sound barriers to be constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project.

As seen on Figure 1.5, as part of this alternative, the new southbound I-215 ramps would remove the existing commercial and retail buildings. As a result, the ramps would be directly adjacent to the Terrace Village RV Park and Grand Terrace Mobile Home Park. However, as discussed in Sections 2.12, Air Quality, and 2.13, Noise, these areas would not be substantially impacted by noise or vehicle emissions.

The I-215/Barton Road interchange is an existing facility and therefore Alternative 3 would not divide or create a barrier to the surrounding neighborhoods. Although Alternative 3 would convert freeway-adjacent properties from nonresidential and residential uses to transportation uses, Alternative 3 would not appreciably change the cohesion and character of the community, and impacts to community character and cohesion are not anticipated to be substantial.

Alternative 6 (Modified Cloverleaf Interchange)

Alternative 6 would displace 2 single-family dwellings that are directly adjacent to I-215. Like Alternative 3, these residences are interspersed in a commercial area. Due to the fragmented nature of the residential community, and the limited cohesion indicated by the existing demographic profile, the residential acquisitions under Alternative 6 would not divide an existing neighborhood or fragment a cohesive neighborhood.

Alternative 6 would result in 19 business displacements; none of the displacements would be in addition to those identified for Alternative 3. The businesses that would be displaced are listed by business name, based on a review by City of Grand Terrace staff, and are shown in Table 2.3.I.

Like those under Alternative 3, the new southbound I-215 ramps would be placed adjacent to Terrace Village RV Park and Grand Terrace Mobile Home Park, but the ramps would not be as close to the parcels as they would be under Alternative 3.

Like Alternative 3, a portion of the sound barrier that will be constructed adjacent to Grand Royal Mobile Estates along the southbound I-215 off-ramp as part of the approved I-215 Bi-County HOV Lane Gap Closure Project would be removed (approximately 250 linear ft of the barrier) to allow for reconstruction of the I-215 southbound off-ramp and the new southbound on-ramp that are part of Alternative 6.

The removed portion of the sound barrier would be reconstructed along the State right-of-way line proposed in conjunction with Build Alternative 6.

Table 2.3.I Alternative 6 Business Displacements

Business Name	Type of Business	Service Area	City
Genesis Hair	Hair Salon	Local	Grand Terrace
All TV VCR	Electronics Repair	Local/Regional	Grand Terrace
Empire Cash Register	Cash Register Sales and Repair	Regional	Grand Terrace
Animal Emergency Clinic	Pet Clinic	Local/Regional	Grand Terrace
Diane Johnson (enrolled agent)	Taxes	Local	Grand Terrace
Auto Diagnostic Service aka Automotive Network Solutions	Auto Repair	Local	Grand Terrace
The Paragon Tattoo and Gallery	Tattoo	Local	Grand Terrace
Soft Touch Poodle Palace	Pet Grooming	Local	Grand Terrace
Mori Hokana Smile Solutions	Dental Lab	Local/Regional	Grand Terrace
Vintage Boutique	Clothing Sales	Local	Grand Terrace
The Rec Center	Business Services	Local	Grand Terrace
Terra Loma Real Estate, Inc.	Real Estate	Local/Regional	Grand Terrace
Ornell Fire Sprinklers	Sprinklers	Local/Regional	Grand Terrace
Financial Solutions	Financial Planning/Taxes	Local/Regional	Grand Terrace
Demetri's Burgers	Restaurant	Local	Grand Terrace
On Point Tax Services	Taxes	Local/Regional	Grand Terrace
PDS Transportation	Freight moving company	Regional	Grand Terrace
Loan Savings/American Professional Group	Loans	Local/Regional	Grand Terrace
Auto Zone	Auto Parts and Accessories	Local	Grand Terrace

Source: Email from Richard Shields, City of Grand Terrace Public Works Director (June 11, 2013).

Like Alternative 3, the sound barriers that will be constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project adjacent to Grand Terrace Elementary School along the northbound I-215 on-ramp and adjacent to the Grand Royal Mobile Estates will reduce traffic noise associated with Alternative 6.

As discussed in Section 2.13, Noise, other sound barriers were modeled for Alternative 6. Only the sound barriers that met the Caltrans Noise Protocol requirements and that are not already included as part of the I-215 Bi-County HOV Lane Gap Closure Project, are proposed for each Build Alternative. For Alternative 6, there is the potential for a sound barrier to be constructed adjacent to Grand Terrace Mobile Home Park and Terrace Village RV Park; however, construction of this barrier is dependent on surveys of property owners and final design.

Like Alternative 3, on the west side of I-215, a new east-west road would be constructed between Grand Terrace Mobile Home Park and the single-family residential area that connects to Vivienda Avenue and Grand Terrace Road. This would provide an alternative route to this area, since La Crosse Avenue in the northwest quadrant would be removed as a result of the new freeway ramps. Because

this circulation change would maintain access to area properties, no substantial impacts would occur.

Alternative 6 would improve operations and LOS at the interchange. Bicycle lanes and sidewalks would be constructed consistent with the City of Grand Terrace Circulation Element (2010).

Traffic noise level increases would be minimal and will be reduced adjacent to sensitive receptors through construction of sound barriers to be constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project.

By converting freeway- adjacent properties from nonresidential and residential uses to transportation uses, Alternative 6 would not appreciably change the cohesion and character of the community. For the reasons outlined above, impacts to community character and cohesion would not be substantial.

Modified Alternative 7 (Modified Cloverleaf/ Diamond Interchange) (Preferred Alternative)

Modified Alternative 7 would displace the same two single-family dwellings as Alternative 6 that are directly adjacent to I-215. Like Alternatives 3 and 6, these residences are interspersed in a commercial area. Due to the fragmented nature of the residential community, and the limited cohesion indicated by the existing demographic profile, the residential acquisitions under Modified Alternative 7 would not divide an existing neighborhood or fragment a cohesive neighborhood.

Modified Alternative 7 would result in 21 business displacements; none of the displacements would be in addition to those identified for Alternative 3. The businesses that would be displaced are listed by business name, based on a review by City of Grand Terrace staff, and are shown in Table 2.3.J.

A portion of the sound barrier that will be constructed adjacent to Grand Royal Mobile Estates along the southbound I-215 off-ramp as part of the approved I-215 Bi-County HOV Lane Gap Closure Project would be removed (approximately 285 ft of the barrier) to allow for reconstruction of the I-215 southbound off-ramp and the new southbound on-ramp that are part of Modified Alternative 7. The removed portion of the sound barrier would be reconstructed along the planned new State right-of-way line for Modified Alternative 7.

Table 2.3.J Modified Alternative 7 (Preferred Alternative) Business Displacements

Business Name	Type of Business	Service Area	City
Genesis Hair	Hair Salon	Local	Grand Terrace
All TV VCR	Electronics Repair	Local/Regional	Grand Terrace
Empire Cash Register	Cash Register Sales and Repair	Regional	Grand Terrace
Animal Emergency Clinic	Pet Clinic	Local/Regional	Grand Terrace
Diane Johnson (enrolled agent)	Taxes	Local	Grand Terrace
Auto Diagnostic Service aka Automotive Network Solutions	Auto Repair	Local	Grand Terrace
The Paragon Tattoo and Gallery	Tattoo	Local	Grand Terrace
Soft Touch Poodle Palace	Pet Grooming	Local	Grand Terrace
Mori Hokana Smile Solutions	Dental Lab	Local/Regional	Grand Terrace
Vintage Boutique	Clothing Sales	Local	Grand Terrace
The Rec Center	Business Services	Local	Grand Terrace
Terra Loma Real Estate, Inc.	Real Estate	Local/Regional	Grand Terrace
Ornell Fire Sprinklers	Sprinklers	Local/Regional	Grand Terrace
Financial Solutions	Financial Planning/Taxes	Local\Regional	Grand Terrace
Demetri's Burgers	Restaurant	Local	Grand Terrace
On Point Tax Services	Taxes	Local\Regional	Grand Terrace
PDS Transportation	Freight moving company	Regional	Grand Terrace
Loan Savings/American Professional Group	Loans	Local\Regional	Grand Terrace
Auto Zone	Auto Parts and Accessories	Local	Grand Terrace
Superior Pool Products	Wholesale distributor of swimming pool supplies	Regional	Grand Terrace
Winnelson Wholesale Plumbing	Wholesale plumbing	Regional	Grand Terrace

Source: Email from Richard Shields, City of Grand Terrace Public Works Director (June 11, 2013).

The sound barriers that will be constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project adjacent to Grand Terrace Elementary School along the northbound I-215 on-ramp and adjacent to the Grand Royal Mobile Estates will reduce traffic noise associated with Modified Alternative 7.

As discussed in Section 2.13, Noise, other sound barriers were modeled for Modified Alternative 7. Only the sound barriers that met the Caltrans Noise Protocol requirements and that are not already included has part of the I-215 Bi-County HOV Lane Gap Closure Project, are proposed for each Build Alternative. For Modified Alternative 7, no additional sound barriers are proposed, other than the modified section at the I-215 southbound off-ramp described above.

Like Alternatives 3 and 6, on the west side of I-215, a new east-west road would be constructed between Grand Terrace Mobile Home Park and the single-family residential area, which connects to Vivienda Avenue and Grand Terrace Road. This would provide an alternative route to this area, since La Crosse Avenue in the northwest quadrant would be removed as a result of the new southbound I-215 ramps. Because this circulation change would maintain access to area properties, no

substantial impacts would occur. Like Alternatives 3 and 6, Modified Alternative 7 would reduce congestion at the interchange, thereby improving circulation for local businesses and residents. Since the residences and businesses that would remain are already located adjacent to an existing interchange, the overall character of the community as freeway- and interchange-adjacent would not change.

By converting freeway-adjacent properties from nonresidential and residential uses to transportation uses, Modified Alternative 7 would not appreciably change the cohesion and character of the community. For the reasons outlined above, impacts to community character and cohesion would not be substantial.

2.3.1.4 Avoidance, Minimization, and/or Mitigation Measures

The following Avoidance and Minimization Measures would be implemented to minimize impacts to existing neighborhoods and businesses. Measure TR-1, Section 2.5 (implementation of a TMP), would also minimize temporary impacts to community character and cohesion.

CI-1 **Community Outreach Program.** During Final Design, the Project team will develop and implement a community outreach and public involvement program to inform the community including Grand Terrace Elementary School about Project construction activities**.**

CI-2 **Construction Management Program.** The Project team will develop and implement a construction management program that maintains access to and from the Project area through signage, detours, and flag persons.

2.3.2 Relocations and Real Property Acquisition

2.3.2.1 Regulatory Setting

Caltrans Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 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 United

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

2.3.2.2 Affected Environment

This section is based on information regarding relocations and displacement impacts from the CIA (November 2013), DRIS (September 2013), and the *Final Relocation Impact Statement* (FRIS) (January 2014) prepared for this Project.

The assessment of relocation impacts includes the Cities of Grand Terrace and Colton. This is the replacement area for the displaced residential and nonresidential uses, chosen for its resemblance to the land uses within the Project area—a mix of residential, commercial, industrial, public, and open space.

2.3.2.3 Environmental Consequences

Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area and would, therefore, not require temporary construction easements.

Alternative 3 (Partial Cloverleaf Interchange)

Alternative 3 would require TCEs from approximately 18 parcels for the purpose of construction vehicle, equipment, or personnel access and staging of construction materials. In addition, Alternative 3 would require TCEs on a number of properties where partial acquisitions would occur (refer to Figure 2.3.2 for the location of all TCEs required under Alternative 3). TCEs would be required from Grand Terrace Elementary School in order to construct retaining walls and make roadway improvements. The retaining walls would be constructed within State right-of-way, adjacent to the northbound I-215 on-ramp (Figure 2.3.2). The TCE would be needed to provide enough room for workers to construct the walls. The chain-link fence along the school's border would be removed, and temporary fencing would be installed. After construction, the chain-link fencing would be replaced and the area landscaped. In addition, a TCE is needed from the school at the northwest corner of Barton Road and Vivienda Avenue for access purposes to reconstruct this intersection. Therefore, existing pedestrian and vehicular access to Grand Terrace Elementary School provided via Barton Road would be temporarily impacted during construction of the Alternative 3. Vehicular, pedestrian, and bicycle access to the school during construction would be addressed in the TMP.

LEGEND

- Alternative 3 Layout
- Proposed Right of Way
- Temporary Construction Limit
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Proposed Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

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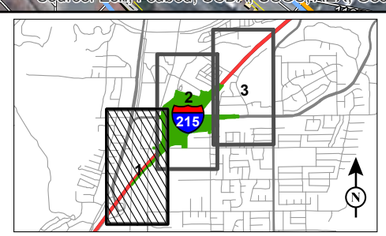

SOURCE: Microsoft (5/2010); San Bernardino Cnty. (3/08, 9/2013); AECOM (5/2011); OPC (7/1/2013)

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FIGURE 2.3.2
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Alternative 3

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LEGEND

- Alternative 3 Layout
- Proposed Right of Way
- Temporary Construction Limit
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Proposed Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

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SOURCE: Microsoft (5/2010); San Bernardino Cnty. (3/08, 9/2013); AECOM (5/2011); OPC (7/1/2013)

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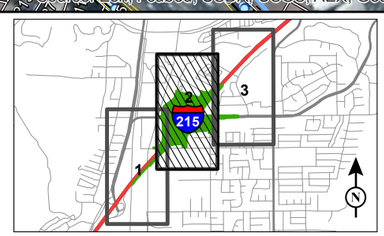

FIGURE 2.3.2
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Alternative 3

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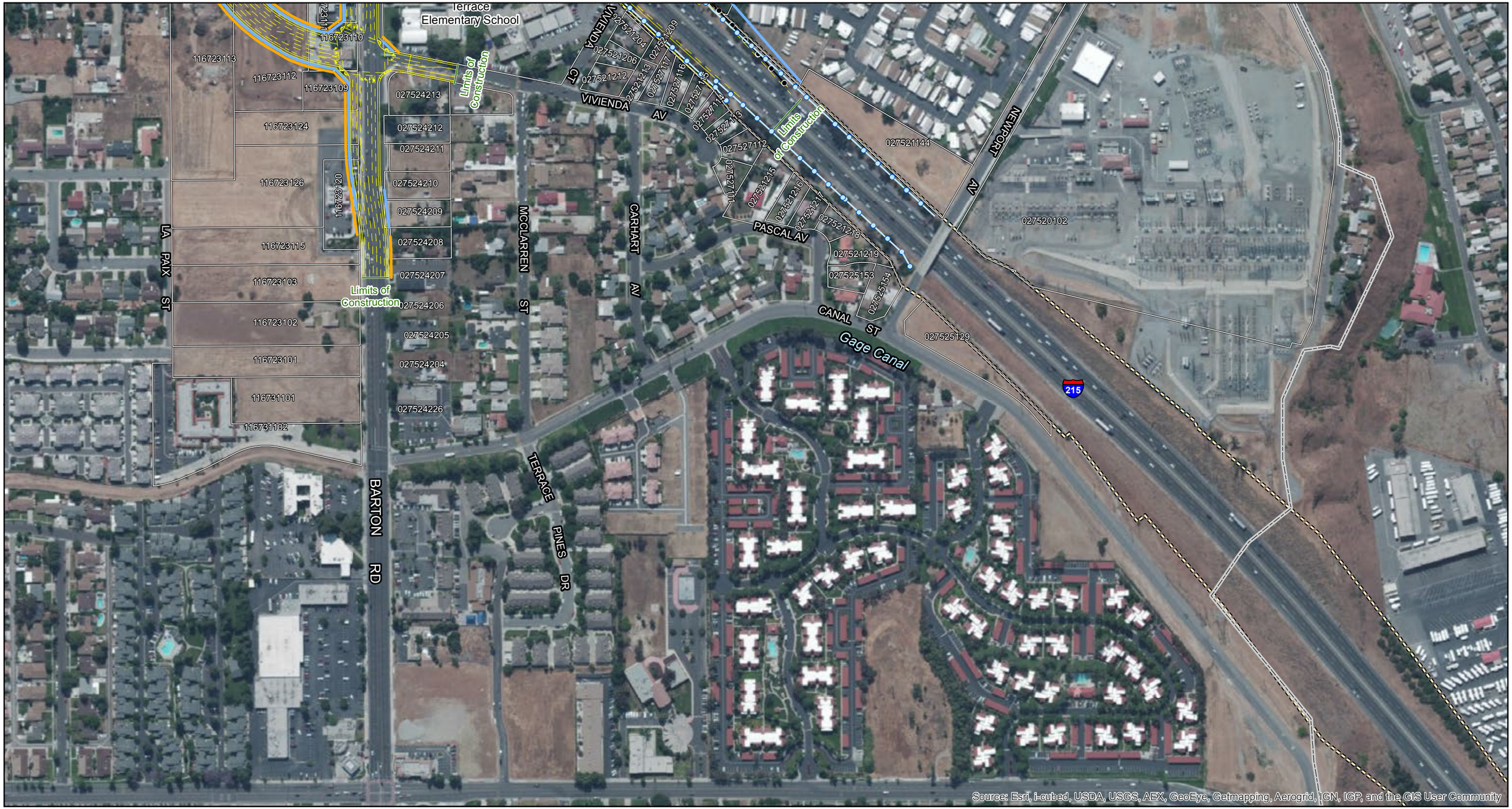

LEGEND

- Alternative 3 Layout
- Proposed Right of Way
- Temporary Construction Limit
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Proposed Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

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SOURCE: Microsoft (5/2010); San Bernardino Cnty. (3/08, 9/2013); AECOM (5/2011); OPC (7/1/2013)

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FIGURE 2.3.2
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Alternative 3

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After construction, all of the TCEs would be restored to their original pre-Project conditions. TCEs would not require businesses, employees, or residents to relocate. Owners of the parcels affected by TCEs would be compensated for temporary use of their property during construction. For these reasons, temporary right of way acquisition impacts are not anticipated to be substantial.

Alternative 6 (Modified Cloverleaf Interchange)

Alternative 6 would require TCEs from approximately 15 parcels. In addition, Alternative 6 would require TCEs on a number of properties where partial acquisitions would occur (refer to Figure 2.3.3 for the location of all TCEs required under Alternative 6). Alternative 6 would require the same TCE from Grand Terrace Elementary School as Alternative 3 and Modified Alternative 7 for the retaining walls and for the northwest corner of Barton Road and Vivienda Avenue (Figure 2.3.3). In addition, Alternative 6 would require a TCE from the school along Barton Road in order to widen the roadway. This TCE would not affect access to the school, and fencing would be placed to separate the construction area from the playfield.

After construction, all of the TCEs would be restored to their original pre-Project condition. No displacements would occur. Therefore, temporary property acquisition impacts are not anticipated to be substantial.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Modified Alternative 7 would require TCEs from approximately 3 parcels. In addition, Modified Alternative 7 would require TCEs on a number of properties where partial acquisitions would occur (refer to Figure 2.3.4 for the location of all TCEs required under Modified Alternative 7). Modified Alternative 7 would require the same TCE from Grand Terrace Elementary School as Alternative 3 and 6 for the retaining walls and for the northwest corner of Barton Road and Vivienda Avenue (refer to Figure 1.7, Sheet 2). In addition, Modified Alternative 7 would require the same TCE as Alternative 6 along Barton Road.

After construction, all of the TCEs would be restored to their original pre-Project condition. No displacements would occur. Therefore, temporary property acquisition impacts are not anticipated to be substantial.

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LEGEND

- Alternative 6 Layout
- Proposed Right of Way; 31 Ease Lines
- Temporary Construction Easement
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Potential Sound Barrier
- Proposed Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

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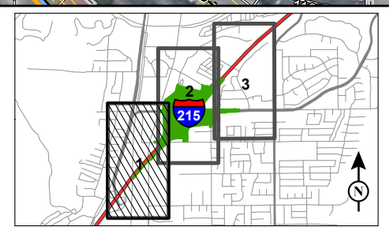

SOURCE: Microsoft (5/2010); San Bernardino Cnty. (3/08, 9/2013); AECOM (11/2011); OPC (7/1/2013)

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FIGURE 2.3.3
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Alternative 6

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Canal
LA CROSSE AV
WALNUT AV
BURNS AV
GRAND TERRACE RD
DE BERRY ST
COMMERCE WY
VIVIENDA AV
LA CROSSE AV
MICHIGAN AV
215
Limits of Construction
Grand Terrace Mobile Home Park
Terrace Village RV Park
Grand Terrace Fitness Park
Grand Terrace Elementary School
Grand Royal Mobile Estates
116715111
116713105
116713106
116713112
116713102
116713101
116713113
116712103
116712102
116712108
116712111
116712110
116712109
116712101
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027522327
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027523128
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027523139
027523140
027523131
027523132
0275231xx
027523111
027523112
116715114
116715101
116717112
116717113
116717111
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116716103
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116714108
116714103
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116723110
116723113
027523209
027523208
027523204
027521116
027521117
027521143
027521153
027521204
027521206
027521209
Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

LEGEND

- Alternative 6 Layout
- Proposed Right of Way; 31 Ease Lines
- Temporary Construction Easement
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Potential Sound Barrier
- Proposed Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

0 150 300
FEET

SOURCE: Microsoft (5/2010); San Bernardino Cnty. (3/08, 9/2013); AECOM (11/2011); OPC (7/1/2013)

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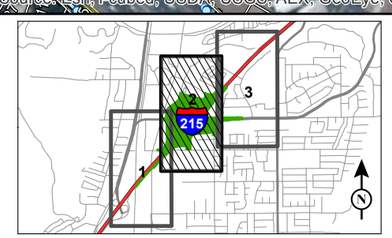

FIGURE 2.3.3
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Alternative 6

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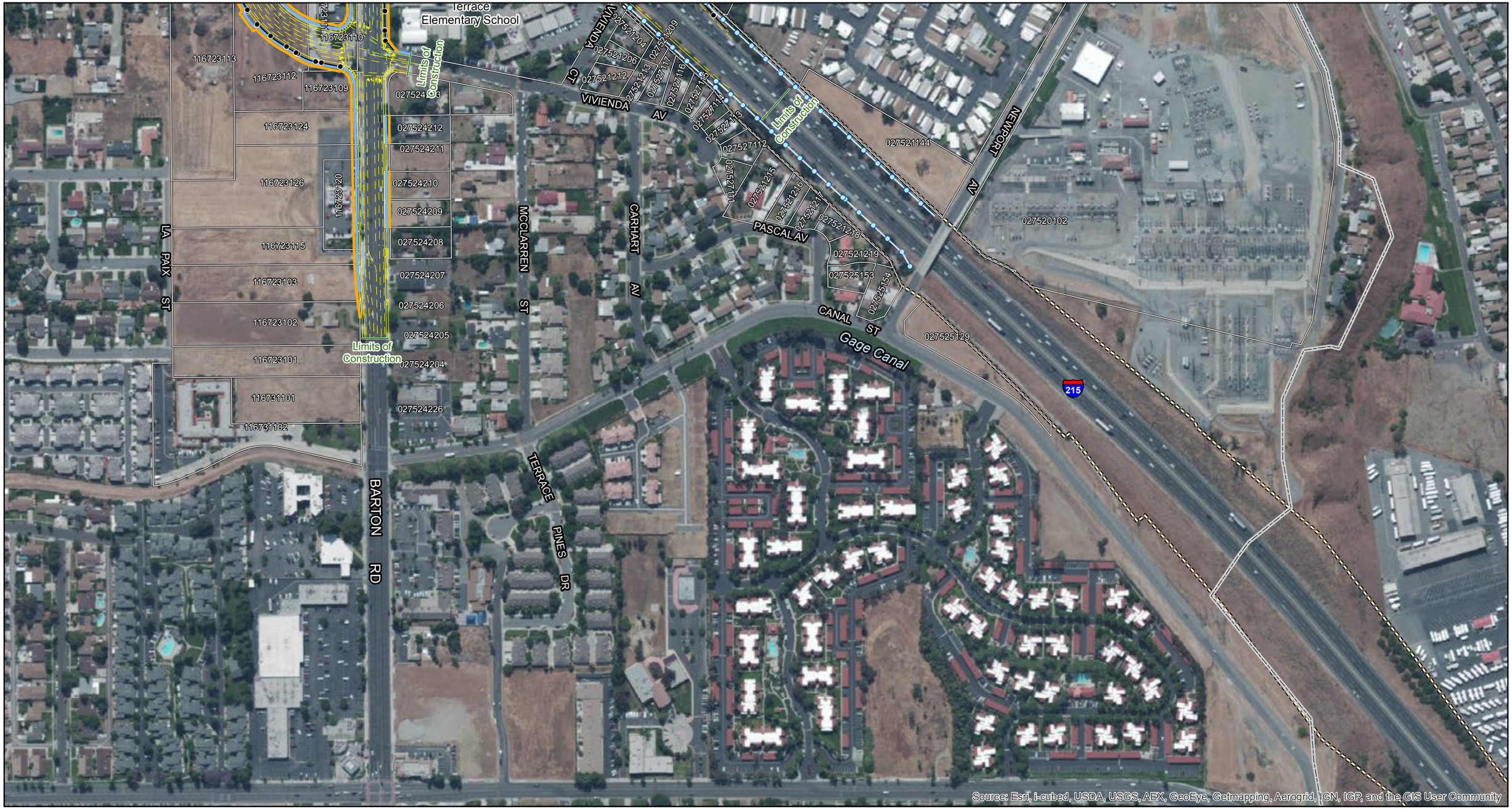

LEGEND

- Alternative 6 Layout
- Proposed Right of Way; 31 Ease Lines
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- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

0 150 300
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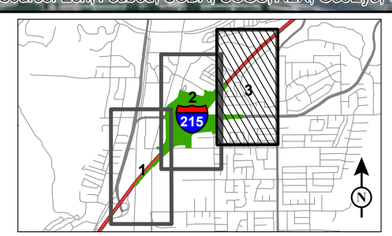

FIGURE 2.3.3
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Alternative 6

SOURCE: Microsoft (5/2010); San Bernardino Cnty. (3/08, 9/2013); AECOM (11/2011); OPC (7/1/2013)

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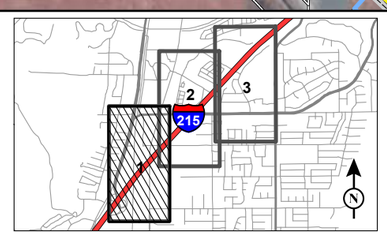
LEGEND

- Modified Alternative 7 Layout
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Planned Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

0 150 300
FEET



SOURCE:Microsoft (5/2010); San Bernardino Cnty. (3/2008, 9/2013); AECOM (4/2013); OPC (7/1/2013)

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FIGURE 2.3.4
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Modified Alternative 7 (Preferred Alternative)

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LEGEND

- Modified Alternative 7 Layout
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Planned Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

0 150 300
FEET

SOURCE:Microsoft (5/2010); San Bernardino Cnty. (3/2008, 9/2013); AECOM (4/2013); OPC (7/1/2013)

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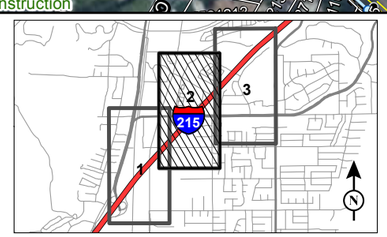

FIGURE 2.3.4
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Modified Alternative 7 (Preferred Alternative)

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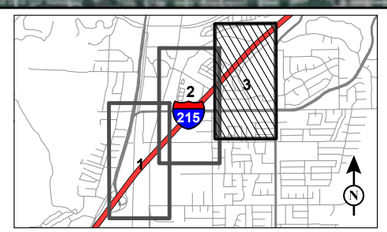
LEGEND

- Modified Alternative 7 Layout
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- City Boundary
- Grand Terrace Fitness Park
- Proposed Retaining Wall
- Planned Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Existing Caltrans Right of Way

0 150 300
FEET



SOURCE:Microsoft (5/2010); San Bernardino Cnty. (3/2008, 9/2013); AECOM (4/2013); OPC (7/1/2013)

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FIGURE 2.3.4
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Potential Property Acquisitions - Modified Alternative 7 (Preferred Alternative)

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Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area and would, therefore, not require any property acquisitions.

Separately, the I-215 Bi-County HOV Lane Gap Closure Project would also not permanently acquire right-of-way within the Project area that would result in displacements.

Alternative 3 (Partial Cloverleaf Interchange)

As shown in Table 2.3.K, it is anticipated that Alternative 3 would potentially result in 30 full acquisitions. A total of 8 single-family residences and 31 businesses would be displaced. A total of 28 potential full acquisitions are expected in the City of Grand Terrace, and 2 potential full acquisitions are expected in the City of Colton.

As shown in Table 2.3.L, it is anticipated that Alternative 3 would potentially result in 42 partial acquisitions. The partial acquisition at Assessor's Parcel Number (APN) 0275-231-69 would require reconstruction of the clubhouse at the Terrace Village RV Park. Figure 2.3.2 shows Alternative 3, based on preliminary engineering efforts to-date, existing right of way limits, and the anticipated future right of way limits if Alternative 3 were constructed.

Table 2.3.M shows the service area of the businesses in the vicinity of the interchange that will be displaced by Alternatives 3, 6, and/or Modified Alternative 7. Based on communication with City of Grand Terrace staff, it was determined that the majority of businesses cater to local as well as regional clientele.[1] For purposes of this table, "local" refers to the surrounding neighborhood, as well as adjacent communities such as Highgrove (less than a 2 mi radius from the Project area), and "regional" would generally be areas north of I-10, west of the Santa Ana River, east of the Grand Terrace city boundary and south of the Highgrove community. Businesses catering to regional clientele and pass-through traffic are typically less affected by relocation than those that serve only local clientele that has been built up over many years.

[1] Telephone conversation with Sandra Molina, Planning Department, City of Grand Terrace, August 23, 2012.

Table 2.3.K Potential Full Acquisitions Anticipated Under Alternative 3

APN	Property Type	Present Use	Business Names	Sales or Service[1]	City
0275-211-17	Residential	SFR	N/A	N/A	Grand Terrace
0275-211-43	Vacant	Residential Yard	N/A	N/A	Grand Terrace
0275-223-59	Residential	SFR	N/A	N/A	Grand Terrace
0275-231-25	Residential	SFR	N/A	N/A	Grand Terrace
0275-223-12	Residential	SFR	N/A	N/A	Grand Terrace
0275-223-16	Commercial	Business Offices (Vacant)	N/A	N/A	Grand Terrace
0275-223-60	Residential	SFR/Storage	N/A	N/A	Grand Terrace
0275-231-46	Commercial	Retail Strip	Genesis Hair	Sales/Service	Grand Terrace
			All TV VCR	Service	Grand Terrace
			Empire Cash Register	Service	
			Mori Hokana Smile Solutions	Sales/Service	
			Animal Emergency Clinic	Service	
			Diane Johnson (enrolled agent)	Sales/Service	
			Auto Diagnostic Service aka Automotive Network Solutions	Sales	
			The Paragon Tattoo and Gallery	Service	
			Vintage Boutique	Service	
			The Rec Center	Sales	
			Terra Loma Real Estate, Inc.	Service	
			Ornell Fire Sprinklers	Sales	
			Financial Solutions	Service	
			Soft Touch Poodle Palace (Pet Salon)	Sales/Service	
0275-231-68	Commercial	Offices/ Restaurant	Demetri's Burgers	Sales	Grand Terrace
			On Point Tax Services	Service	
			PDS Transportation	Service	
			Loan Savings/American Professional Group	Service	
0275-232-05	Residential	SFR	N/A	N/A	Grand Terrace
0275-232-10	Residential	SFR	N/A	N/A	Grand Terrace
0275-232-09	Residential	SFR	N/A	N/A	Grand Terrace
1167-121-01	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-121-10	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-121-11	Commercial	Auto Repair	Blue Mountain Collision Center	Service	Grand Terrace
1167-131-01	Commercial	Stores	WinBath & Kitchen Showroom/DarCrest Vehicle Storage	Sales/Service	Colton
1167-131-02	Commercial	Stores	Orkin	Sales/Service	Colton
			Hose-Man	Sales/Service	
1167-131-12	Vacant	Transmission Lines	N/A	N/A	Grand Terrace
1167-141-01	Commercial	Service Station	Shell Station aka Keromina Market Place/Circle K Convenience Store	Sales	Grand Terrace
1167-141-02	Commercial	Service Station	Quick Stop (Arco Station)	Sales	Grand Terrace
1167-141-04	Commercial	Recreational	Cal Skate	Sales/Service	Grand Terrace
1167-141-05	Commercial	Office Building	N/A	N/A	Grand Terrace
1167-141-08	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-141-09	Commercial	Retail	Roblee's Carpet & Flooring	Sales/Service	Grand Terrace
1167-141-10	Commercial	Service/Retail	Superior Pool Products	Sales/Service	Grand Terrace
1167-141-11	Commercial	Service/Retail	Winnelson Wholesale Plumbing	Sales/Service	Grand Terrace
1167-141-12	Commercial	Service/Office	Essco	Sales/Service	Grand Terrace
1167-151-08	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-231-10	Commercial	Service/Retail	Auto Zone	Sales	Grand Terrace
1167-231-20	Commercial	Fast Food	Miguel's Jr.	Sales	Grand Terrace

Source: OPC (2013).

[1] Based on the business type, a determination was made regarding whether or not the business likely collected sales taxes.

Table 2.3.L Potential Partial Acquisitions Anticipated Under Alternative 3

APN	Property Type	City
0275-211-16	Residential	Grand Terrace
0275-211-53	Residential	Grand Terrace
0275-223-22	Railroad	Grand Terrace
0275-223-27	Residential	Grand Terrace
0275-223-51	Residential	Grand Terrace
0275-223-55	Residential	Grand Terrace
0275-231-11	Residential	Grand Terrace
0275-231-12	Residential	Grand Terrace
0275-231-28	Residential	Grand Terrace
0275-231-47	Vacant	Grand Terrace
0275-231-57	Vacant	Grand Terrace
0275-231-58	Vacant	Grand Terrace
0275-231-59	Vacant	Grand Terrace
0275-231-60	Vacant	Grand Terrace
0275-231-61	Vacant	Grand Terrace
0275-231-62	Vacant	Grand Terrace
0275-231-63	Vacant	Grand Terrace
0275-231-64	Vacant	Grand Terrace
0275-231-65	Vacant	Grand Terrace
0275-231-66	Vacant	Grand Terrace
0275-231-69	Commercial	Grand Terrace
0275-232-04	Public Land	Grand Terrace
0275-242-09	Residential	Grand Terrace
0275-242-10	Public Land	Grand Terrace
1167-121-02	Industrial	Grand Terrace
1167-121-03	Industrial	Grand Terrace
1167-121-04	Industrial	Colton
1167-121-09	Commercial	Colton
1167-131-05	Commercial	Colton
1167-131-06	Commercial	Colton
1167-151-01	Vacant	Grand Terrace
1167-151-09	Vacant	Grand Terrace
1167-151-14	Vacant	Riverside
1167-161-01	Vacant	Grand Terrace
1167-161-02	Vacant	Grand Terrace
1167-161-03	Residential	Grand Terrace
1167-231-11	Commercial	Grand Terrace
1167-231-22	Commercial	Grand Terrace
1167-231-23	Commercial	Grand Terrace
1167-231-24	Commercial	Grand Terrace
1167-231-25	Commercial	Grand Terrace
1167-231-26	Commercial	Grand Terrace

Source: County of San Bernardino Assessor's Data (2013); OPC (2013).

Table 2.3.M Business Service Area

Business Name	Type of Business	Customers Locations	City
Genesis Hair	Hair Salon	Local	Grand Terrace
All TV VCR	Electronics Repair	Local/Regional	Grand Terrace
Empire Cash Register	Cash Register Sales and Repair	Regional	Grand Terrace
Animal Emergency Clinic	Pet Clinic	Local/Regional	Grand Terrace
Diane Johnson (enrolled agent)	Taxes	Local	Grand Terrace
Auto Diagnostic Service aka Automotive Network Solutions	Auto Repair	Local	Grand Terrace
The Paragon Tattoo and Gallery	Tattoo	Local	Grand Terrace
Soft Touch Poodle Palace	Pet Grooming	Local	Grand Terrace
Mori Hokana Smile Solutions	Dental Lab	Local/Regional	Grand Terrace
Vintage Boutique	Clothing Sales	Local	Grand Terrace
The Rec Center	Business Services	Local	Grand Terrace
Terra Loma Real Estate, Inc.	Real Estate	Local/Regional	Grand Terrace
Ornell Fire Sprinklers	Sprinklers	Local/Regional	Grand Terrace
Financial Solutions	Financial Planning/Taxes	Local/Regional	Grand Terrace
Demetri's Burgers	Restaurant	Local	Grand Terrace
On Point Tax Services	Taxes	Local/Regional	Grand Terrace
PDS Transportation	Freight Moving Company	Regional	Grand Terrace
Loan Savings/American Professional Group	Loans	Local/Regional	Grand Terrace
Shell Station aka Keromina Market Place/Circle K Convenience Store	Gas Station and Food Mart	Local	Grand Terrace
Auto Zone	Auto Parts and Accessories	Local	Grand Terrace
Blue Mountain Collision Center	Auto Repair/Restoration	Local	Colton
WinBath & Kitchen Showroom/DarCrest Vehicle Storage	Bath and Kitchen Furniture Sales/Vehicle Storage	Local/Regional	Colton
Orkin	Pest Control Services	Local/Regional	Colton
Hose-Man	Hydraulic/Industrial Hose Sales and Service	Local/Regional	Colton
Cal Skate	Recreation	Local/Regional	Grand Terrace
Quick Stop (Arco Station)	Gas Station and Food Mart	Local	Grand Terrace
Roblee's Carpet & Flooring	Tile and Carpet Sales, Carpet Cleaning	Local	Grand Terrace
Superior Pool Products	Wholesale Distributor of Swimming Pool Supplies	Regional	Grand Terrace
Winnelson Wholesale Plumbing	Wholesale Plumbing	Regional	Grand Terrace
Essco	Wholesale Electric	Regional	Grand Terrace
Miguel's Jr.	Restaurant	Local	Grand Terrace

Source: *Community Impact Assessment* (CIA) (November 2013).

Based on the type of businesses listed in Table 2.3.M, the majority of the displaced businesses are expected to serve the local community (City of Grand Terrace and southeastern portion of the city of Colton) as well as adjacent communities, and therefore, could maintain their clientele after relocation, although there would be a loss of revenue between the closing of the old business and the establishment of the business at the new location. Businesses to be displaced include an electronics repair shop, a kitchen showroom, a dental lab, a flooring supply store, rollerskating rink, a wholesale plumbing supply company, a company specializing in hose sales and

service, a wholesale pool products distributor, a pest control services vendor, a wholesale electric supply company, real estate, tax, and loan services, a cash register sales and supply company, and an emergency pet clinic. These types of businesses are specialty businesses that can draw customers from a larger area than local neighborhoods. Due to their nature and location, few businesses would substantially rely on the local clientele. These businesses include: Soft Touch Poodle Palace, Miguel's Junior, and Demetri's Burgers. None of these businesses are major employment centers for the local population and thus Build Alternatives would not substantially affect the community.

A search for similar services was conducted to identify businesses that could substitute for the relocated businesses in servicing local clientele. As detailed on the City of Grand Terrace's website,[1] there are 9 registered auto-repair-related businesses, 1 pet grooming service, 7 tax companies, 13 beauty and hair salons, 3 dental labs, and 12 restaurants within a 2 mi radius of the I-215/Barton Road interchange. In addition, an internet search[2] found 9 pet clinics within a 5 mi radius of the interchange, and 2 tattoo studios are located within approximately 5 mi. However, regarding the pet clinics within 5 mi of the interchange, these facilities are generally not open after 6:00 p.m. on weekdays and are not open 24 hours per day on weekends and holidays like the Animal Emergency Clinic, although some of them have an emergency contact number. The next closest emergency pet clinic is located in Upland, just north of I-10, approximately 22 mi from the interchange. While there are other businesses that can deliver similar services as the affected businesses to the neighborhood residents, the outcome regarding the Animal Emergency Clinic may result in animal emergencies needing to be handled by on-call veterinarians or by the emergency clinic in Upland. However, according to DRIS results there are available replacement properties in the City of Grand Terrace and Colton for these relocated businesses to reestablish. The City of Grand Terrace has indicated that it would prefer to have the affected businesses needing relocation to relocate within the city limits. In case of businesses that cater to regional customers like auto care, financial institutions, and service stores, the neighborhood residents do not depend on their services for essential goods and services. The gasoline stations would service local neighborhoods as well as pass-through traffic on Barton Road and I-215. The restaurants would serve both local residents/employees as well as people from the

1 http://www.cityofgrandterrace.org/index.aspx?NID=503 (accessed February 21, 2012).
2 Accessed February 21, 2012.

surrounding area. There would be no relocation of other neighborhood-serving businesses/facilities such as churches or grocery stores.

With exception of the gasoline stations, which serve pass-through traffic and rely on good visibility from surrounding roadways, the remaining businesses are not in high visibility locations and do not display elevated signs. The gasoline stations would need to be relocated to suitable areas based on visibility, appropriate subsurface conditions, and appropriate geographic distance between nearby stations. Because the majority of the businesses are not expected to be directly dependent on the local neighborhoods for survival and do not rely on high visibility from roadways, no substantial impacts are anticipated.

Alternative 3 would displace 28 businesses in the City of Grand Terrace and 3 businesses in the City of Colton. Business displacements under Alternative 3, would potentially impact 131-321 employees. Alternative 3 would potentially impact approximately 2.1-5.0 percent of the City of Grand Terrace's labor force and approximately 0.03-0.1 percent of the City of Colton's labor force. However, based on the DRIS, it is anticipated that all of the businesses except for one gasoline station could be relocated within the City of Grand Terrace. Replacement businesses also exist within the City of Colton. Additional replacement properties may become available prior to construction of the Project.

Property Tax Loss

Acquisitions under Alternative 3 would result in losses of property revenue to the local jurisdictions. Table 2.3.N presents impacts on local property taxes under Alternative 3.

Table 2.3.N Estimated Annual Property Tax Loss Under Alternative 3

Jurisdiction	Property Tax Revenue Loss	Total Annual City/ County Property Tax Revenue[1]	Percent of Total Annual Property Tax Revenue Loss
City of Grand Terrace	$147,793	$7,572,296	2.00%
City of Colton	$7,190	$25,565,795	0.03%
Total	**$154,983**	**—**	**—**

Source: San Bernardino County Office of Tax Collector, www.mytaxcollector.com (accessed February 2012 and August 2013).

1 Total City tax revenue was obtained from the Auditor's Controller's Office and is based on tax rolls obtained from the Cities in 2011. Email correspondence with San Bernardino County Auditor-Controller-Recorder, Franciliza Zyss, Accountant III (February 2012).

As shown in Table 2.3.N, Alternative 3 would result in the loss of an estimated $154,983 in annual property tax revenue. The City of Grand Terrace would lose 2.0 percent of the City's total property annual tax revenue. Alternative 3 would acquire two parcels in the City of Colton, which equates to an estimated 0.03 percent in property tax loss.

Sales Tax Loss

The property acquisitions associated with Alternative 3 would result in the displacement of a number of sales-tax-generating businesses, which could potentially result in losses of sales tax revenue to the local jurisdictions. In the event that all businesses from one city relocate within the same city boundary, there would be no net loss of sales tax revenue to that city. However, relocation outside a particular city would result in a net loss of sales tax revenue to the city that the business is leaving. The displacement of businesses that provide services as opposed to sales would not result in the loss of sales tax.

The potential annual sales tax revenue losses to the City of Grand Terrace and the County of San Bernardino resulting from the displacement of businesses from the City of Grand Terrace under Alternative 3 are shown in Table 2.3.O. If all 16 sales tax-generating businesses to be potentially displaced under Alternative 3 were relocated outside the City of Grand Terrace, the potential annual sales tax loss for the City of Grand Terrace would be an estimated $51,423, which would be an 8.2 percent loss.

Table 2.3.O Estimated Annual Sales Tax Revenue Loss to the City of Grand Terrace Under Alternative 3

Jurisdiction	Tax Rate	Taxable Sales (2011)	Total Sales Tax Revenue	Average Sales Tax/ Business	Sales Tax Revenue Loss[1]	Percent of Total Annual Sales Tax Revenue Loss
City of Grand Terrace	0.75%	$83,563,000	$626,723	$3,214	$51,423	8.2%
County of San Bernardino Transportation Fund	0.25%	—	$208,908	$1,071	$17,141[2]	—
County of San Bernardino (Measure I)	0.50%	—	$417,815	$2,143	$34,282[2]	—

Source: Taxable Sales in California (Sales and Use Tax) Report 2011 (http://www.boe.ca.gov/news/tsalescont11.htm; accessed August 11, 2013).

1 Assumes displacement of 16 sales tax-generating businesses.

2 Represents the maximum sales tax loss that could occur if displaced businesses were relocated outside of San Bernardino County.

The potential annual sales tax revenue losses to the City of Colton and the County of San Bernardino resulting from the displacement of businesses from the City of Colton under Alternative 3 are shown in Table 2.3.P. If all three of the sales tax-generating businesses to be potentially displaced under Alternative 3 were relocated outside the City of Colton, the potential annual sales tax loss for the City of Colton would be an estimated $13,483, which would be a 0.35 percent loss.

Table 2.3.P Potential Annual Sales Tax Revenue Losses Related to Business Displacements in the City of Colton Under Alternative 3

Jurisdiction	Tax Rate	Taxable Sales (2011)	Total Sales Tax Revenue	Average Sales Tax/ Business	Sales Tax Revenue Loss[1]	Percent of Total Annual Sales Tax Revenue Loss
City of Colton	0.75%	$513,554,000	$3,851,655	$4,494	$13,483	0.35%
County of San Bernardino Transportation Fund	0.25%	—	$1,283,885	$1,498	$4,494[2]	—
County of San Bernardino (Measure I)	0.50%	—	$2,567,770	$2,996	$8,989[2]	—

Source: Taxable Sales in California (Sales and Use Tax) Report 2011 (http://www.boe.ca.gov/news/tsalescont11.htm; accessed August 11, 2013).

[1] Assumes displacement of 3 sales tax-generating businesses.

[2] Represents the maximum sales tax loss that could occur if displaced businesses were relocated outside of San Bernardino County.

According to the DRIS, it is anticipated that displaced businesses would be relocated within San Bernardino County. Under this scenario, there would be no loss of Measure I funding, which is administered by the San Bernardino Association of Governments (SANBAG), nor any loss of sales tax revenue to the San Bernardino County Transportation Fund. Nevertheless, Tables 2.3.O and 2.3.P show the estimated maximum annual sales tax loss if all of the businesses were relocated outside of San Bernardino County.

Although Alternative 3 would fully acquire 30 properties and displace several residents and businesses, the DRIS determined that there is a sufficient supply of replacement properties within the two affected Cities. The highest tax loss would be in the City of Grand Terrace, with an estimated loss of 8.2 percent of sales taxes; however, these taxes would be recovered for relocations that occur within the City of Grand Terrace. Similarly, it is anticipated that all potentially displaced employees would be employed at the relocated businesses. Based on the discussion above, the property acquisitions and associated displacements for Alternative 3 are not anticipated to result in substantial impacts.

Alternative 6 (Modified Cloverleaf Interchange)

As shown in Table 2.3.Q, Alternative 6 would result in 10 full acquisitions, including 2 residential, 4 nonresidential, and 4 vacant parcels. A total of 2 single-family residences and 19 businesses would be displaced. All full acquisitions would occur in the City of Grand Terrace.

Table 2.3.Q Potential Full Acquisitions Anticipated Under Alternative 6

APN	Property Type	Present Use	Business Names	Sales or Service[1]	City
0275-231-46	Commercial	Retail Strip	Genesis Hair	Sales/Service	Grand Terrace
			All TV VCR	Service	
			Empire Cash Register	Service	
			Mori Hokana Smile Solutions	Sales/Service	
			Animal Emergency Clinic	Service	
			Diane Johnson (enrolled agent)	Sales/Service	
			Auto Diagnostic Service aka Automotive Network Solutions	Sales	
			The Paragon Tattoo and Gallery	Service	
			Vintage Boutique	Service	
			The Rec Center	Sales	
			Terra Loma Real Estate, Inc.	Service	
			Ornell Fire Sprinklers	Sales	
			Financial Solutions	Service	
			Soft Touch Poodle Palace (Pet Salon)	Sales/Service	
0275-231-68	Commercial	Offices/ Restaurant	Demetri's Burgers	Sales	Grand Terrace
			On Point Tax Services	Service	
			PDS Transportation	Service	
			Loan Savings/American Professional Group	Service	
0275-231-25	Residential	SFR	N/A	N/A	Grand Terrace
1167-141-05	Commercial	Office Building	N/A	N/A	Grand Terrace
1167-151-01	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-161-01	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-161-02	Vacant	Vacant Lot	N/A	N/A	Grand Terrace
1167-231-10	Commercial	Service/Retail	Auto Zone	Sales	Grand Terrace
0275-232-05	Residential	SFR	N/A	N/A	Grand Terrace
1167-151-08	Vacant	Vacant Lot	N/A	N/A	Grand Terrace

Source: OPC (2013).

[1] Based on the business type, a determination was made regarding whether or not the business likely collected sales taxes.

As shown in Table 2.3.R, Alternative 6 would result in 43 partial acquisitions. The partial acquisition at APN 0275-231-69 would require reconstruction of the clubhouse at the Terrace Village RV Park.

Table 2.3.R Potential Partial Acquisitions Anticipated Under Alternative 6

APN	Property Type	City
0275-231-11	Residential	Grand Terrace
0275-231-12	Residential	Grand Terrace
0275-231-47	Vacant	Grand Terrace
0275-231-57	Vacant	Grand Terrace
0275-231-58	Vacant	Grand Terrace
0275-231-59	Vacant	Grand Terrace
0275-231-60	Vacant	Grand Terrace
0275-231-61	Vacant	Grand Terrace
0275-231-62	Vacant	Grand Terrace
0275-231-63	Vacant	Grand Terrace
0275-231-64	Vacant	Grand Terrace
0275-231-65	Vacant	Grand Terrace
0275-231-66	Vacant	Grand Terrace
0275-231-69	Commercial	Grand Terrace
0275-232-10	Residential	Grand Terrace
1167-121-01	Vacant	Grand Terrace
1167-121-02	Industrial	Grand Terrace
1167-121-09	Commercial	Colton
1167-141-01	Commercial	Grand Terrace
1167-141-02	Commercial	Grand Terrace
1167-141-04	Commercial	Grand Terrace
1167-141-03	Commercial	Grand Terrace
1167-141-08	Vacant	Grand Terrace
1167-141-09	Commercial	Grand Terrace
1167-141-10	Commercial	Grand Terrace
1167-141-11	Commercial	Grand Terrace
1167-141-12	Commercial	Grand Terrace
1167-151-09	Vacant	Grand Terrace
1167-151-14	Vacant	Grand Terrace
1167-161-03	Residential	Grand Terrace
1167-161-06	Commercial	Grand Terrace
1167-231-11	Commercial	Grand Terrace
1167-231-20	Commercial	Grand Terrace
1167-231-22	Commercial	Grand Terrace
1167-231-23	Commercial	Grand Terrace
1167-231-24	Commercial	Grand Terrace
1167-231-25	Commercial	Grand Terrace
1167-231-26	Commercial	Grand Terrace
1167-231-28	Commercial	Grand Terrace
0275-232-04	Public Land	Grand Terrace
0275-242-09	Residential	Grand Terrace
0275-242-10	Public Land	Grand Terrace
0275-242-12	Commercial	Grand Terrace

Source: County of San Bernardino Assessor's Data (2013); OPC (2013).

Figure 2.3.3 shows Alternative 6, based on preliminary engineering efforts to-date, existing right of way limits, and the anticipated future right of way limits if Alternative 6 were constructed. Business impacts would be fewer than those identified for Alternative 3. Based on the type of businesses listed in Table 2.3.Q, the majority of the displaced businesses are expected to serve the local as well as adjacent communities and therefore could maintain their clientele after relocation, although there would be a loss of revenue between the closing of the old business and the establishment of the business at the new location. With exception of the gasoline station, which serves pass-through traffic and relies on good visibility from surrounding roadways, the remaining businesses are not in high visibility locations and do not display elevated signs. The gasoline station would need to be relocated to a suitable area based on visibility, appropriate subsurface conditions, and appropriate geographic distance between nearby stations. Because the majority of the businesses are not expected to be directly dependent on the local neighborhoods for survival and do not rely on high visibility from roadways, no substantial impacts are anticipated.

Alternative 6 would potentially impact 40-102 employees. Alternative 6 would result in the lowest impacts related to employee displacement in the City of Grand Terrace (0.7-1.7 percent) among the Build Alternatives and would result in no employee displacement impacts in the City of Colton.

Property Tax Loss

Table 2.3.S presents impacts on local property taxes under Alternative 6. Alternative 6 would fully acquire 10 parcels in the City of Grand Terrace, resulting in a loss of $49,087 in property taxes, which constitutes 0.6 percent of the City's total annual property tax revenue. No parcels from the City of Colton would be fully acquired under Alternative 6, and no property tax loss would occur.

Table 2.3.S Estimated Annual Property Tax Loss Under Alternative 6

Jurisdiction	Property Tax Revenue Loss	Total Annual City/County Property Tax Revenue[1]	Percent of Total Annual Property Tax Revenue Loss
City of Grand Terrace	$49,087	$7,572,296	0.6%
City of Colton	$0	$25,565,795	0.0%
Total	**$49,087**	—	—

Source: San Bernardino County Office of Tax Collector (www.mytaxcollector.com, accessed February 2012 and August 2013).

[1] Total City tax revenue was obtained from the Auditor's Controller's Office and is based on tax rolls obtained from the Cities in 2011. Email correspondence with San Bernardino County Auditor-Controller-Recorder, Franciliza Zyss, Accountant III (February 2012).

Sales Tax Loss

The potential annual sales tax revenue losses to the City of Grand Terrace and the County of San Bernardino resulting from the displacement of businesses from the City of Grand Terrace under Alternative 6 are shown in Table 2.3.T. If all 9 sales tax-generating businesses to be potentially displaced under Alternative 6 were relocated outside the City of Grand Terrace, the potential annual sales tax loss for the City of Grand Terrace would be an estimated $28,926, which would be a 4.5 percent loss. Because Alternative 6 would not relocate businesses from the City of Colton it would not result in sales tax losses to the City of Colton.

Table 2.3.T Estimated Annual Sales Tax Revenue Loss to the City of Grand Terrace Under Alternative 6

Jurisdiction	Tax Rate	Taxable Sales (2011)	Total Sales Tax Revenue	Average Sales Tax/ Business	Sales Tax Revenue Loss[1]	Percent of Total Annual Sales Tax Revenue Loss
City of Grand Terrace	0.75%	$83,563,000	$626,723	$3,214	$28,926	4.5%
County of San Bernardino Transportation Fund	0.25%	—	$208,908	$1,071	$9,642[2]	—
County of San Bernardino (Measure I)	0.5%	—	$417,815	$2,143	$19,284[2]	—

Source: Taxable Sales in California (Sales and Use Tax) Report 2011 (http://www.boe.ca.gov/news/tsalescont11.htm; accessed August 11, 2013).

[1] Assumes displacement of 9 sales tax-generating businesses.

[2] Represents the maximum sales tax loss that could occur if displaced businesses were relocated outside of San Bernardino County.

Alternative 6 would fully acquire 10 properties and displace several residents and businesses. The highest tax loss would be in the City of Grand Terrace, with an estimated loss of 4.5 percent of sales taxes; however, these taxes would be recovered for relocations that occur within the City of Grand Terrace, which is the intention of Caltrans relocation program. Similarly, it is anticipated that the same number of displaced employees would gain employment at the relocated businesses. Relocation impacts under Alternative 6 would be less than those for Alternative 3. For the reasons described in detail above, relocation and real property acquisition impacts are not considered substantial.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

As shown in Table 2.3.U, Modified Alternative 7 would result in 8 full acquisitions, including 2 residential and 6 nonresidential parcels. A total of 21 businesses and 2 residences would be displaced. All full acquisitions would occur in the City of Grand Terrace.

Table 2.3.U Potential Full Acquisitions Anticipated Under Modified Alternative 7 (Preferred Alternative)

APN	Property Type	Present Use	Business Names	Sales or Service[1]	City
0275-231-46	Commercial	Retail Strip	Genesis Hair	Sales/Service	Grand Terrace
			All TV VCR	Service	
			Empire Cash Register	Service	
			Mori Hokana Smile Solutions	Sales/Service	
			Animal Emergency Clinic	Service	
			Diane Johnson (enrolled agent)	Sales/Service	
			Auto Diagnostic Service aka Automotive Network Solutions	Sales	
			The Paragon Tattoo and Gallery	Service	
			Vintage Boutique	Service	
			The Rec Center	Sales	
			Terra Loma Real Estate, Inc.	Service	
			Ornell Fire Sprinklers	Sales	
			Financial Solutions	Service	
			Soft Touch Poodle Palace (Pet Salon)	Sales/Service	
0275-231-68	Commercial	Office/ Restaurant	Demetri's Burgers	Sales	Grand Terrace
			On Point Tax Services	Service	
			PDS Transportation	Service	
			Loan Savings/American Professional Group	Service	
0275-231-25	Residential	SFR	N/A	N/A	Grand Terrace
1167-141-05	Commercial	Office Building	N/A	N/A	Grand Terrace
0275-232-05	Residential	SFR	N/A	N/A	Grand Terrace
1167-141-10	Commercial	Service/Retail	Superior Pool Produce	Sale	Grand Terrace
1167-141-11	Commercial	Service/Retail	Winnelson Wholesale Plumbing	Sale/Service	Grand Terrace
1167-231-10	Commercial	Service/Retail	Auto Zone	Sale/Service	Grand Terrace

Source: OPC (2013).

[1] Based on the business type, a determination was made regarding whether or not the business likely collected sales taxes.

As shown in Table 2.3.V, Modified Alternative 7 would result in 41 partial acquisitions. The partial acquisition at APN 0275-231-69 would require reconstruction of the clubhouse at the Terrace Village RV Park.

Table 2.3.V Potential Partial Acquisitions Anticipated Under Modified Alternative 7 (Preferred Alternative)

APN	Property Type	City
0275-223-27	Residential	Grand Terrace
0275-231-11	Residential	Grand Terrace
0275-231-12	Residential	Grand Terrace
0275-231-28	Residential	Grand Terrace
0275-231-47	Vacant	Grand Terrace
0275-231-57	Vacant	Grand Terrace
0275-231-58	Vacant	Grand Terrace
0275-231-59	Vacant	Grand Terrace
0275-231-60	Vacant	Grand Terrace
0275-231-61	Vacant	Grand Terrace
0275-231-62	Vacant	Grand Terrace
0275-231-63	Vacant	Grand Terrace
0275-231-64	Vacant	Grand Terrace
0275-231-65	Vacant	Grand Terrace
0275-231-66	Vacant	Grand Terrace
0275-231-69	Commercial	Grand Terrace
0275-232-04	Public Land	Grand Terrace
0275-232-09	Residential	Grand Terrace
0275-232-10	Residential	Grand Terrace
0275-242-09	Residential	Grand Terrace
0275-242-10	Public Land	Grand Terrace
1167-121-01	Vacant	Grand Terrace
1167-121-02	Industrial	Grand Terrace
1167-121-08	Public Land	Grand Terrace
1167-121-09	Commercial	Colton
1167-141-01	Commercial	Grand Terrace
1167-141-02	Commercial	Grand Terrace
1167-141-03	Commercial	Grand Terrace
1167-141-04	Commercial	Grand Terrace
1167-141-08	Vacant	Grand Terrace
1167-141-09	Commercial	Grand Terrace
1167-141-12	Commercial	Grand Terrace
1167-151-01	Vacant	Grand Terrace
1167-161-01	Vacant	Grand Terrace
1167-231-11	Commercial	Grand Terrace
1167-231-20	Commercial	Grand Terrace
1167-231-22	Commercial	Grand Terrace
1167-231-23	Commercial	Grand Terrace
1167-231-24	Commercial	Grand Terrace
1167-231-25	Commercial	Grand Terrace
1167-231-26	Commercial	Grand Terrace

Source: County of San Bernardino Assessor's Data (2013); OPC (2013).

Figure 2.3.4 shows Modified Alternative 7, based on preliminary engineering efforts to-date, existing right of way limits, and the anticipated future right of way limits if Modified Alternative 7 were constructed.

Business impacts would be fewer than those identified for Alternative 3. Based on the type of businesses listed in Table 2.3.U, the majority of the displaced businesses are expected to serve the local as well as adjacent communities and, therefore, could maintain their clientele after relocation, although there would be a loss of revenue between the closing of the old business and the establishment of the business at the new location. With exception of the gasoline station, which serves pass-through traffic and relies on good visibility from surrounding roadways, the remaining businesses are not readily visible from I-215 and do not display signs visible from the freeway. The gasoline station would need to be relocated to a suitable area based on visibility, appropriate subsurface conditions, and zoning designation. Because the majority of the businesses are not expected to be directly dependent on the local neighborhoods for survival and do not rely on visibility from roadways, no substantial impacts are anticipated.

Modified Alternative 7 would potentially impact 60-140 employees, and would potentially impact 1.0-2.3 percent of the labor force in the City of Grand Terrace. Modified Alternative 7 would not acquire any properties in the City of Colton and thus would not result in labor force displacements.

Property Tax Loss

Table 2.3.W presents impacts on local property taxes under Modified Alternative 7. As shown in Table 2.3.W, Modified Alternative 7 would result in a loss of $42,127 in property taxes, which constitutes 0.6 percent of the City of Grand Terrace's total annual property tax revenue. No parcels from the City of Colton would be fully acquired under Modified Alternative 7, and no property tax loss would occur.

Table 2.3.W Estimated Annual Property Tax Loss Under Modified Alternative 7 (Preferred Alternative)

Jurisdiction	Property Tax Revenue Loss	Total Annual City/County Property Tax Revenue[1]	Percent of Total Annual Property Tax Revenue Loss
City of Grand Terrace	$42,127	$7,572,296	0.6%
City of Colton	$0	$25,565,795	0.0%
Total	**$42,127**	—	—

Source: San Bernardino County Office of Tax Collector (www.mytaxcollector.com, accessed February 2012 and August 2013).

[1] Total City tax revenue was obtained from the Auditor's Controller's Office and is based on tax rolls obtained from the Cities in 2011. Email correspondence with San Bernardino County Auditor-Controller-Recorder, Franciliza Zyss, Accountant III (February 2012).

Sales Tax Loss

The potential annual sales tax revenue losses to the City of Grand Terrace and the County of San Bernardino resulting from the displacement of businesses from the City of Grand Terrace under Modified Alternative 7 are shown in Table 2.3.X. Because no parcels would be acquired within the City of Colton, there would be no sales tax loss for Colton under Modified Alternative 7. Based on the displacement of 11 sales tax-generating businesses within the City of Grand Terrace, if all 11 sales tax-generating businesses to be potentially displaced under Modified Alternative 7 were relocated outside the City of Grand Terrace, the potential annual sales tax loss for the City of Grand Terrace would be an estimated $35,354, which would be a 5.6 percent loss. Because Modified Alternative 7 would not relocate businesses from the City of Colton, it would not result in sales tax losses to the City of Colton.

Table 2.3.X Estimated Annual Sales Tax Revenue Loss to the City of Grand Terrace Under Modified Alternative 7 (Preferred Alternative)

Jurisdiction	Tax Rate	Taxable Sales (2011)	Total Sales Tax Revenue	Average Sales Tax/ Business	Sales Tax Revenue Loss[1]	Percent of Total Annual Sales Tax Revenue Loss
City of Grand Terrace	0.75%	$83,563,000	$626,723	$3,214	$35,354	5.6%
County of San Bernardino Transportation Fund	0.25%	—	$208,908	$1,071	$11,785[2]	—
County of San Bernardino (Measure I)	0.50%	—	$417,815	$2,143	$23,569[2]	—

Source: Taxable Sales in California (Sales and Use Tax) Report 2011 (http://www.boe.ca.gov/news/tsalescont11.htm; accessed August 11, 2013).

1 Assumes displacement of 11 sales tax-generating businesses.

2 Represents the maximum sales tax loss that could occur if displaced businesses were relocated outside of San Bernardino County.

Modified Alternative 7 would fully acquire 8 properties and displace several residents and businesses. The highest tax loss would be in the City of Grand Terrace, with an estimated loss of 5.6 percent of sales taxes; however, these taxes would be recovered for relocations that occur within the City of Grand Terrace, which is the intention of the Caltrans relocation program. Similarly, it is anticipated that the same number of displaced employees would gain employment at the relocated businesses. Relocation impacts under Modified Alternative 7 would be less than those for Alternative 3 and would be slightly more than those

for Alternative 6. For the reasons described in detail above, relocation and real property acquisition impacts are not considered substantial.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Availability of Replacement Housing

All relocation impacts would occur in the Cities of Grand Terrace and Colton. The replacement area for the households potentially displaced by the Project is anticipated to be the Cities of Grand Terrace and Colton. As of December 2013, residences available for purchase and rent in these Cities are summarized in Table 2.3.Y.

Table 2.3.Y Residential Units Available for Rent and Sale in the Study Area Cities

Relocation Resource	For Rent	For Sale	Total Units
Multifamily residences	12	10	22
Two-bedroom houses	19	11	30
Three and four-bedroom houses	20	34	54
Mobile homes	0	10	10

Sources: www.immobel.com and www.realtor.com (accessed December 20, 2013).

As shown in Table 2.3.Y, there are sufficient residential resources available for the residents displaced by the Build Alternatives within the Cities of Grand Terrace and Colton. During the time of the survey, 12 multifamily dwelling units with two to three bedrooms were available for rent for $689–$1,600 per month; and 10 multifamily dwelling units with two to three bedrooms were available for sale for $59,000–$265,000.[1] A total of 39 two- to four-bedroom houses were available for rent for $1,100–$2,500 per month, and 45 houses were available for sale for $60,000–$1,160,000.[2] A total of 10 mobile homes priced from $25,000–$99,000 were also available for sale.[3]

Based on the number of available replacement properties in the Cities of Grand Terrace and Colton and rental vacancy rates at 2.2 percent and 10 percent, all residential displacements can be accommodated within the two Cities. However, if comparable replacement housing cannot be found in the Cities of Grand Terrace and Colton for displaced residential uses, the following options are available:

1 www.immobel.com and www.realtor.com, accessed December 20, 2013.

2 Ibid.

3 Ibid.

- Expand the potential relocation area to include additional cities in the region
- Provide funds to residents in displaced households to enable them to purchase affordable housing in the surrounding area
- Implement the Last Resort Housing Program to retrofit/modify existing housing and/or construct new housing

Availability of Nonresidential Properties

Table 2.3.Z identifies available business properties for sale and rent in the Cities of Grand Terrace and Colton as of December 2013.

Table 2.3.Z Availability of Businesses for Rent and Sale in the Replacement Area

Relocation Resource	For Rent – Appropriate Zoning and Site Requirements	For Sale – Appropriate Zoning and Site Requirements	Total Units
Office complex	29	6	35
Industrial complex	25	5	30
Commercial operation	28	10	38

Sources: LoopNet.com (http://www.loopnet.com/; www.CIMLS.com; [accessed December 23, 2013]).

During the time of the survey, approximately 6 office complexes were offered for sale at $349,000 to $2,731,680; 5 industrial complex units were offered for sale for $349,000 to $2,731,680; and 10 commercial units ranging from $179,000 to $6,900,000 were available for sale within the Cities of Grand Terrace and Colton, which would provide adequate relocation resources for the displaced nonresidential uses. The average monthly rent for the 29 office complexes available was $0.52 to $19.20/square foot (sf), and the average monthly rent for the 30 industrial complexes available was $0.30 to $31.76/sf. The average monthly rent for the 28 commercial units available was $1.10 to $30/sf. The research revealed that 23 additional vacant land development opportunities exist within the Cities of Grand Terrace and Colton.

Based on the current availability of industrial/commercial properties for lease or sale in the Cities of Grand Terrace and Colton and current high vacancy rates for office (18 percent in Inland Empire area) and industrial properties (4.4 percent in Inland Empire area), a sufficient number of replacement properties similar to the displaced properties, with exception of a second gasoline station (for Alternative 3), are available on the market in the two cities. One gasoline station is currently available for sale within the City of Grand Terrace. A search indicates that several gasoline stations valued at $129,900 to $6,999,995 are available for sale in the City of San

Bernardino.[1] Based on the discussion above adequate relocation resources are anticipated to be available for nonresidential displaces.

If comparable properties are not available for the potentially displaced businesses in the Cities of Grand Terrace and Colton, opportunities for relocation would be pursued outside of these communities, in nearby cities with available and similarly General Plan designated and zoned properties. This could include the Cities of Riverside and San Bernardino. An estimate of the business costs will be determined between the implementing agency and each business owner regarding just compensation for the business.

The following measures will be implemented to minimize relocations and displacement impacts.

REL-1 **The Uniform Act.** All affected property owners will be provided with a copy of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) (Public Law 91-646, 84 Statutes 1894). As the Project Sponsor, San Bernardino Associated Governments (SANBAG) will ensure the Project complies with the Uniform Act.

The Uniform Act mandates that certain relocation services and payments be made available to eligible residents, businesses, and nonprofit organizations displaced by its 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.

REL-2 **Replacement Housing.** Where acquisition and relocation are unavoidable, the provisions of the Uniform Act would be followed. An independent appraisal of the affected property will be obtained, and an offer for the full appraisal would be made.

The Uniform Act requires that comparable, decent, safe, and sanitary replacement housing that is within a person's financial means be made available before that person may be displaced. In the event that such

[1] www.LoopNet.com, accessed December 23, 2013.

replacement housing is not available for persons displaced by the Project within the statutory limits for replacement housing payments, last resort housing may be provided in a number of prescribed ways.

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. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2010, this was $22,050 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

This section is based on information from the CIA (November 2013). The study area for environmental justice is the community within and surrounding the Project area in which the direct impacts and the indirect impacts of the Project may occur. For this Project, the study area includes the neighborhoods located within and adjacent to the Project design footprint. Community Profile data are collected and organized by city, county, and census tract; therefore, these boundaries are utilized in conjunction with evaluating impacts to the affected environment within the study area.

The environmental justice analysis for the Project describes: (1) the presence of racial minority, Hispanic, and low-income population groups in the study area; (2) potential substantial effects and measures to avoid or minimize those effects for all study area population groups, including racial minority, Hispanic, and low-income population groups; and (3) potential disproportionately high and substantial effects on racial minority, Hispanic, and low-income population groups.

The U.S. Census Bureau uses a slightly different measure than the United States Department of Health and Human Services to determine who is living in poverty.

Poverty thresholds, as calculated by the Census Bureau, are the original version of the federal poverty measure, originally developed by the Social Security Administration, used mainly for statistical purposes – to estimate the number of Americans living in poverty. Poverty guidelines on the other hand are used for administrative purposes, namely to determine financial eligibility for certain federal programs.[1] Poverty thresholds are updated every year by the Census Bureau and estimates provided through ACS reports. Poverty thresholds do not vary geographically, but they are updated for inflation using the Consumer Price Index. For 2010 (the year of the Census data utilized for this analysis), the poverty threshold used by the U.S. Census Bureau for a family of four was $22,314.

The percentage of the racial minority, Hispanic, and low-income populations for each affected census tract, the Cities, and the County is shown in Table 2.3.AA. As identified in Table 2.3.AA, Census Tracts 71.07, 71.09, and 71.10 have the highest percentages of racial minorities in the study area; these percentages are twice as large as the percentages in the Cities of Grand Terrace and Colton as a whole.

Table 2.3.AA Minority and Low-Income Demographics

Area	Percent			Median Household Income[2]
	Racial Minorities[1]	Hispanics[1]	Below Poverty Level[2]	
County of San Bernardino	16	49	16	$55,853
City of Grand Terrace	14	39	6	$64,337
City of Colton	16	71	22	$41,788
Census Tract 71.06 (City of Grand Terrace and City of Colton)	13	41	10	$68,446
Census Tract 71.07 (City of Grand Terrace and City of Colton)	25	53	39	$32,637
Census Tract 71.09 (City of Grand Terrace and City of Colton)	26	39	18	$38,684
Census Tract 71.10 (City of Colton and City of San Bernardino)	32	39	4	$81,206

Source: U.S. Census Bureau, American FactFinder (http://factfinder2.census.gov, (site accessed December 5, 2011).
Note: Persons living in the poverty percentile, which is based on U.S. Census Bureau thresholds, not United States Department of Health and Human Services guidelines. For 2010, the poverty threshold for a family of four was $22,314.

1 From the 2010 Census, Table SF1 DP1. Racial minorities include individuals who identify themselves as Black/African-American, Asian, Native Hawaiian/Pacific Islander, Native American/Native Alaskan (one race only) on the U.S. Census. The Hispanic population is not considered a race but rather an ethnicity; therefore, Hispanics can be of any race.

2 2007-2011 ACS, Table DP03.

1 http://www.census.gov/hhes/www/poverty/methods/definitions.html

The majority population in Census Tract 71.07 and the City of Colton is a racial or ethnic minority (Hispanic). Census Tract 71.06 has a substantially lower percentage of racial minorities in the study area (13 percent) which is consistent with the City of Grand Terrace percentage. Census Tracts 71.06, 71.09, 71.10, and the City of Grand Terrace reported the lowest percentages of Hispanics, whereas Census Tract 71.07 reported the highest percentage of Hispanics (53 percent), which is also higher than the County's percentage (49 percent). Overall, the City of Colton has the highest percentage (71 percent) of Hispanics in the study area.

The percentage of persons living below the poverty level varies in the study area census tracts. Census Tract 71.07 has the largest percentage of persons living below the poverty level, whereas Census Tract 71.10 has the lowest percentage of such individuals. The percentage of persons living below the poverty level in Census Tracts 71.07 and 71.09 is higher than the County percentage.

Census Tract 71.07 represents the least affluent population, with a relatively low median household income, well below that of the County. This census tract is west of I-215 between the Riverside County line and the Santa Ana River. In addition, the median household income for the City of Colton is lower than the median household income for the County. Census Tract 71.10 represents the most affluent population among the study area census tracts. This census tract is in the northern portion of Grand Terrace between Washington Street and I-10.

Based on environmental justice indicators, portions of the Project area appear to contain environmental justice populations. All census tracts except Census Tract 71.06 have a racial minority population that is higher than the County, the City of Grand Terrace, and the City of Colton averages. This census tract is located in the southwest portion of the Project area between Barton Road and the Riverside County line. Overall, Census Tract 71.06 and the City of Grand Terrace have lower percentages of racial minorities, Hispanics, and persons living below the poverty level than the County. The City of Grand Terrace has a primarily White population (66 percent) and a relatively low percentage of persons living below the poverty level (6 percent). Census Tract 71.07 has higher percentages of racial minorities, Hispanics, and persons living below the poverty level than the County.

The City of Colton is generally characterized by higher percentages of racial minorities, Hispanics, and persons living below the poverty level. Although certain portions of the study area contain environmental justice populations (Census Tracts

71.07, 71.09, and 71.10), the Project is primarily within the City of Grand Terrace, with only a small portion within the City of Colton. All of the residential properties in the Project area and vicinity are within the City of Grand Terrace, which, as described above, does not contain a substantial environmental justice population.

2.3.3.3 Environmental Consequences

Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any modifications to the I-215/Barton Road interchange, and there are no planned road modification/maintenance projects on local roadways within the interchange area; therefore, the No Build Alternative would not result in temporary impacts to environmental justice populations.

Separately, neighborhoods adjacent to the freeway will be temporarily impacted by ramp closures at I-215/Barton Road, detours, and closure of the Newport Avenue overcrossing associated with the I-215 Bi-County HOV Lane Gap Closure Project. Avoidance, minimization and/or mitigation measures, including the requirement for a TMP, have been included in the approved environmental documentation for this Project, and no substantial impacts were identified.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Based on the criteria used as the basis for evaluating environmental justice (minority groups, median household income, and poverty level), the Build Alternatives could impact minority and low-income populations with regards to temporary noise, dust, and traffic congestion/detours impacts. However, since all interchange users (not just minority and low-income populations) would be subjected to traffic congestion and detours during construction, all neighboring uses (including both environmental justice and non-environmental justice populations) would experience temporary noise and dust impacts during construction of the Project. These impacts would be comparable for all affected populations in proximity to the Project and would not be appreciably more severe or greater in magnitude in a particular area. Furthermore, all of the residential properties in the Project area and vicinity are within the City of Grand Terrace, which does not contain substantial minority or low-income populations. Therefore, the Project would not cause disproportionately high and adverse temporary effects on minority or low-income populations.

The Build Alternatives would not result in disproportionate temporary impacts to environmental justice populations due to the demographics of the affected census

tracts when compared to the County and Cities as a whole. In addition, as described above, all interchange users would be subjected to traffic congestion and detours during construction, and all neighboring uses would experience temporary noise and dust impacts during construction,

Residents in the vicinity of the interchange would be temporarily impacted by ramp closures, detours, dust, and noise during construction activities, and these impacts would be minimized through compliance with Caltrans standards; additional local, State, and federal regulations; and avoidance, minimization, and/or mitigation measures.

Permanent Impacts

The determination of whether or not the effects of a project are disproportionately high and substantial depends on whether (1) the effects of the project are predominantly borne by a minority or low-income population, or (2) the effects of the project are appreciably more severe or greater in magnitude on minority or low-income populations compared to the effects on nonminority or non-low-income populations.

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the I-215/Barton Road interchange, and there are no planned road modification/maintenance projects on local roadways within the interchange area. Therefore, this alternative would not result in permanent impacts to the environmental justice population.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Alternative 3 would result in eight residential displacements, and Alternatives 6 and Modified Alternative 7 would result in two residential displacements from Census Tract 71.07 within the City of Grand Terrace. Census Tract 71.07 has an ethnically diverse population, with a large Hispanic minority group, a higher poverty level, a lower median household income, and a lower median household income than the County average; however, the City of Grand Terrace, overall, has a lower minority population, a lower poverty level, and a higher median household income than the County average. Due to the demographic differences between the City of Grand Terrace as a whole and Census Tract 71.07, it cannot be concluded that the residential displacements as a result of the Project would impact low-income or minority populations.

Based on the criteria used as the basis for evaluating environmental justice (minority groups, median household income, and poverty level), the Build Alternatives could impact minority and low-income populations with regards to changes to community character and visual quality due to ramp realignments and loss of businesses.

However, since all residents and workers in the vicinity of the Project (regardless of their minority status or income level) would experience changes to community character, visual quality, and the loss of businesses following the completion of the Project, these impacts would be comparable for all affected populations in proximity to the Project and would not be appreciably more severe or greater in magnitude in a particular area. Residents that are displaced would be relocated consistent with Caltrans requirements. In addition, the Build Alternatives would improve interchange operations that would benefit all local populations. Furthermore, all of the residential properties in the Project area and vicinity are within the City of Grand Terrace, which does not contain substantial minority or low-income populations.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have been included in the Project. Based on the current proportion of minority residents, and residents below poverty, median household incomes, and expected displacements in the study area census tracts, disproportionate impacts to environmental justice populations are not anticipated as a result of the Project.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, Alternatives 1, 3, 6, and Modified Alternative 7 will not cause disproportionately high and adverse effects on any minority or low-income populations per EO 12898 regarding environmental justice. No avoidance, minimization, and/or mitigation measures are required or proposed.

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2.4 Utilities and Emergency Services

2.4.1 Affected Environment

This section is based on the information from the *Community Impact Assessment* (November 2013) and the *Draft Project Report* (November 2013).

2.4.1.1 Utilities

Utility providers in the Cities of Grand Terrace and Colton are summarized in Table 2.4.A.

Table 2.4.A Utility Service Providers

Utility Category	Utility Provider	
	City of Grand Terrace	City of Colton
Water	Riverside Highland Water Company	Colton Public Utilities
Wastewater	City of Grand Terrace	Colton Public Utilities
Gas	Southern California Gas Company	Southern California Gas Company
Electricity	Southern California Edison	Colton Public Utilities
Cable Television	Time Warner	Time Warner
Telecommunication	AT&T	SBC
	Verizon	

Sources: City of Colton, http://www.ci.colton.ca.us/;
City of Grand Terrace, http://www.cityofgrandterrace.org/index.aspx?nid=8.

2.4.1.2 Fire Protection

The City of Grand Terrace contracts with the San Bernardino County Fire Department for fire and rescue services. Fire Station 23 at 22582 Center City Court in Grand Terrace has both paid and volunteer staff, including a fire chief, a battalion chief, and a division chief. There are 2 paid employees per shift and 15 paid call employees. The station is approximately 0.7 mile (mi) from the Interstate 215 (I-215)/ Barton Road interchange.

The City of Colton has its own fire department staffed with 46 personnel at four fire stations. The City of Colton Fire Department offers a wide range of services, including but not limited to: fire suppression, emergency medical services, light and heavy rescue, and hazardous materials mitigation. Stations 213 and 214 are the stations closest to the I-215/Barton Road interchange.

Station 213 is at 1100 South La Cadena, Colton, approximately 2 mi from the Project site. This station is staffed with three personnel (a captain, an engineer, and a firefighter/paramedic) and is also home to the Heavy Rescue Unit.

Station 214 is at 1151 South Meadow Lane, approximately 2 mi from the Project site, and is also staffed with three personnel (a captain, an engineer, and a firefighter/ paramedic).

2.4.1.3 Law Enforcement

The City of Grand Terrace contracts with the San Bernardino County Sheriff's Department (SBSD) for full-service law enforcement, traffic services, investigations, and a wide variety of safety services. The sheriff's station responsible for servicing the City of Grand Terrace is located at 655 East Third Street in San Bernardino.

The City of Colton has its own police department that enforces law within the City. The nearest City of Colton police station is at 650 North La Cadena Drive, approximately 4 mi north of the I-215/Barton Road interchange.

The California Highway Patrol (CHP) has jurisdiction on freeways in the State of California, including the I-215. The nearest CHP office is the Inland Communications Center at 847 East Brier Drive, San Bernardino, approximately 5.5 mi from the I-215/ Barton Road interchange.

2.4.1.4 Hospitals

There are no hospitals in the immediate vicinity of the Project intersection. The closest hospital is Arrowhead Regional Medical Center, located at 400 North Pepper Avenue in Colton, which is located within 5 mi of the I-215/Barton Road interchange.

2.4.2 Environmental Consequences

2.4.2.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, the No Build Alternative would not result in temporary impacts to utilities or emergency services.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Build Alternatives would impact various underground and overhead utilities, which would require protection in place, removal, replacement, or relocation. Utilities that would be impacted during construction by the Build Alternatives are listed in Table 2.4.B. Alternative 3 is the only alternative that would potentially relocate cable television lines owned by AT&T, Time Warner, and Charter Communications. For Alternative 6 and Modified Alternative 7, a bridge will be placed over the Riverside

Table 2.4.B Anticipated Utility Relocations During Project Construction

Utility	Owner	Alternative 3	Alternative 6	Modified Alternative 7 (Preferred Alternative)
Sewer	City of Grand Terrace	✓	✓	✓
Water Line	Riverside Highland Water, Elsinore Valley Municipal Water District	✓	✓	✓
Gas Line	Southern California Gas Company	✓	✓	✓
Electrical-underground	Southern California Edison	✓	✓	✓
Utility Poles	Southern California Edison	✓	✓	✓
Electrical-overhead	Southern California Edison	✓	✓	✓
Telecom	AT&T, Time Warner	✓	✓	✓
Cable Television	AT&T, Time Warner, Charter Communications	✓		
Riverside Canal Aqueduct	City of Riverside		✓	✓

Source: *Draft Project Report* (November 2013).

Canal Aqueduct to avoid impacts since this facility has been found to be eligible for the National Register of Historic Places.

Utilities that would require relocation under Alternatives 3, 6, and Modified Alternative 7 are shown in Figures 2.4.1, 2.4.2, and 2.4.3, respectively.

Final determinations of impacts to utilities and relocation requirements, if any, will be completed during the initial design portion of the design-build phase of the Project. An updated utility search would be conducted during final design to confirm all utility conflicts that require protection in place or relocation are addressed. Utility companies typically do not approve such relocations until the final design phase of the Project, and there is the potential that relocations and resulting impacts could vary. If the ultimate utility relocations would create additional environmental impacts beyond those identified in this analysis, then additional environmental analysis would be required. The current analysis is based upon preliminary engineering efforts to-date.

All utility relocations would be coordinated with the affected utility agencies, as specified in Measures UES-1 and UES-2. Road detours and access restrictions due to construction would result in some traffic delays. Extensive ramp closures are not anticipated; however, travel times could temporarily increase due to the closure of lanes. Therefore, during construction, some impairment to the delivery of services, including fire and police response times, may occur. These temporary impacts would

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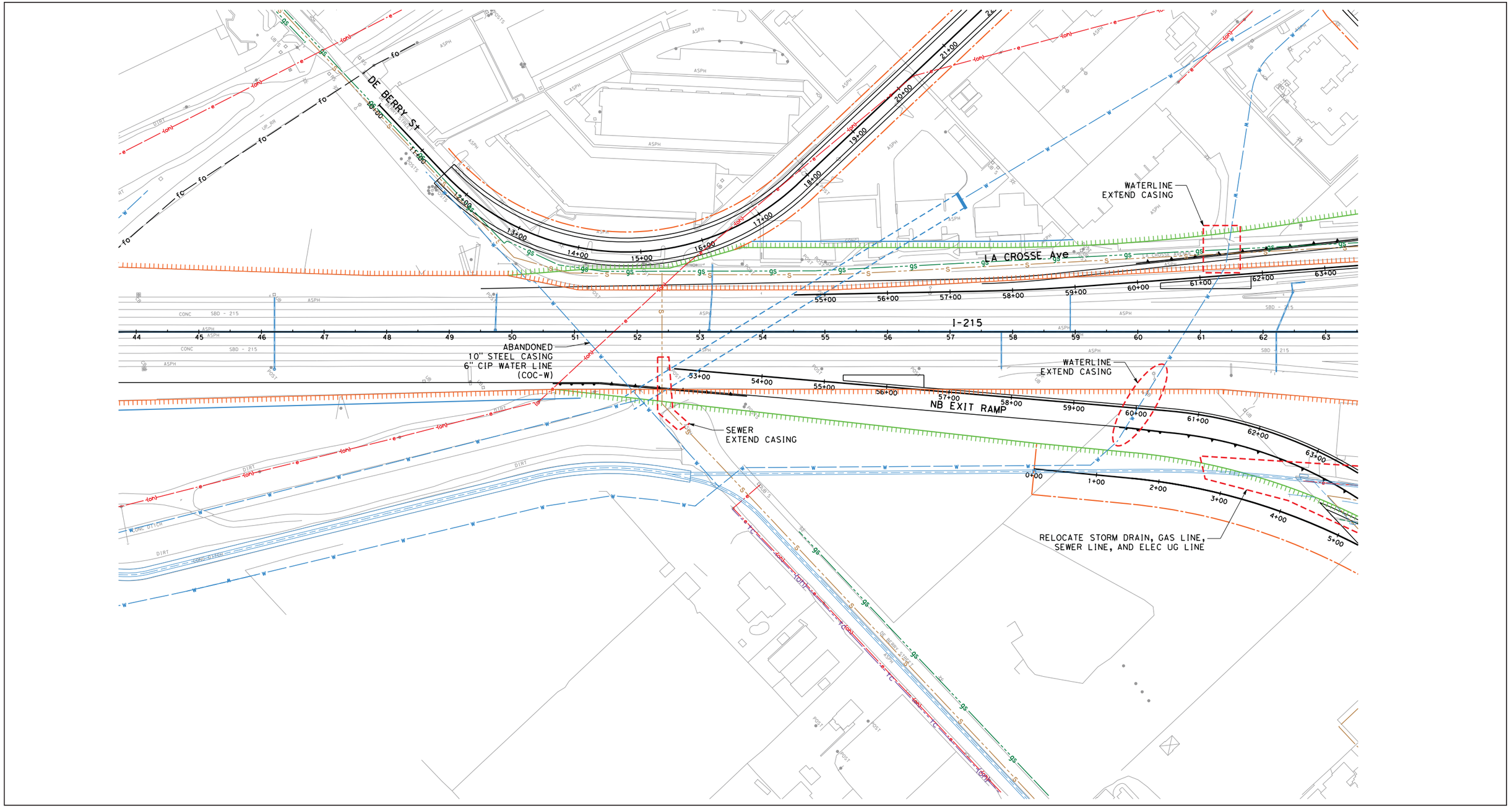

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.1
(Page 1 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 3 Utility Relocation

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ELEC (SCE) RELOCATE
UT POLE RELOCATE
GRAND TERRACE Rd
UT POLE RELOCATE
OH LINE RELOCATE
UT POLE RELOCATE
GAS RELOCATE
WATER RELOCATE
CELL SITE RELOCATE
UG LINE RELOCATE
ELEC UG
SB OFF RAMP
SB ON RAMP
TV BOX RELOCATE
UT POLE RELOCATE
GAS (SOG) RELOCATE
UT POLE RELOCATE
SEWER RELOCATE
SEWER (COGT) RELOCATE
WATERLINE EXTEND CASING
LA CROSSE Ave
UT POLE RELOCATE
GAS RELOCATE
UT POLE RELOCATE
OH LINE RELOCATE
BARTON Rd
I-215

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.1
(Page 2 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 3 Utility Relocation

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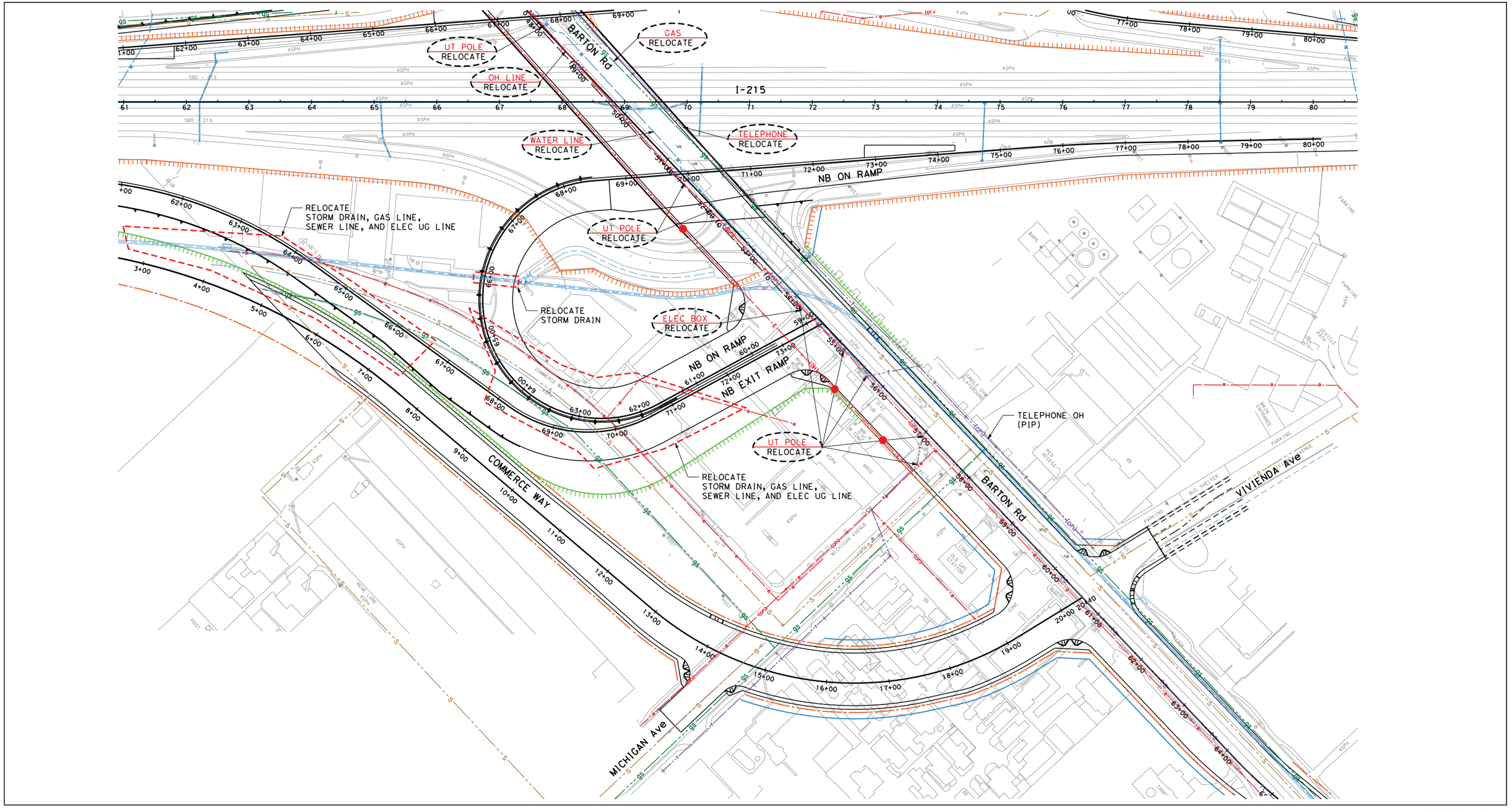

LEGEND

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- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
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SOURCE: AECOM (2/2014)

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FIGURE 2.4.1
(Page 3 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 3 Utility Relocation

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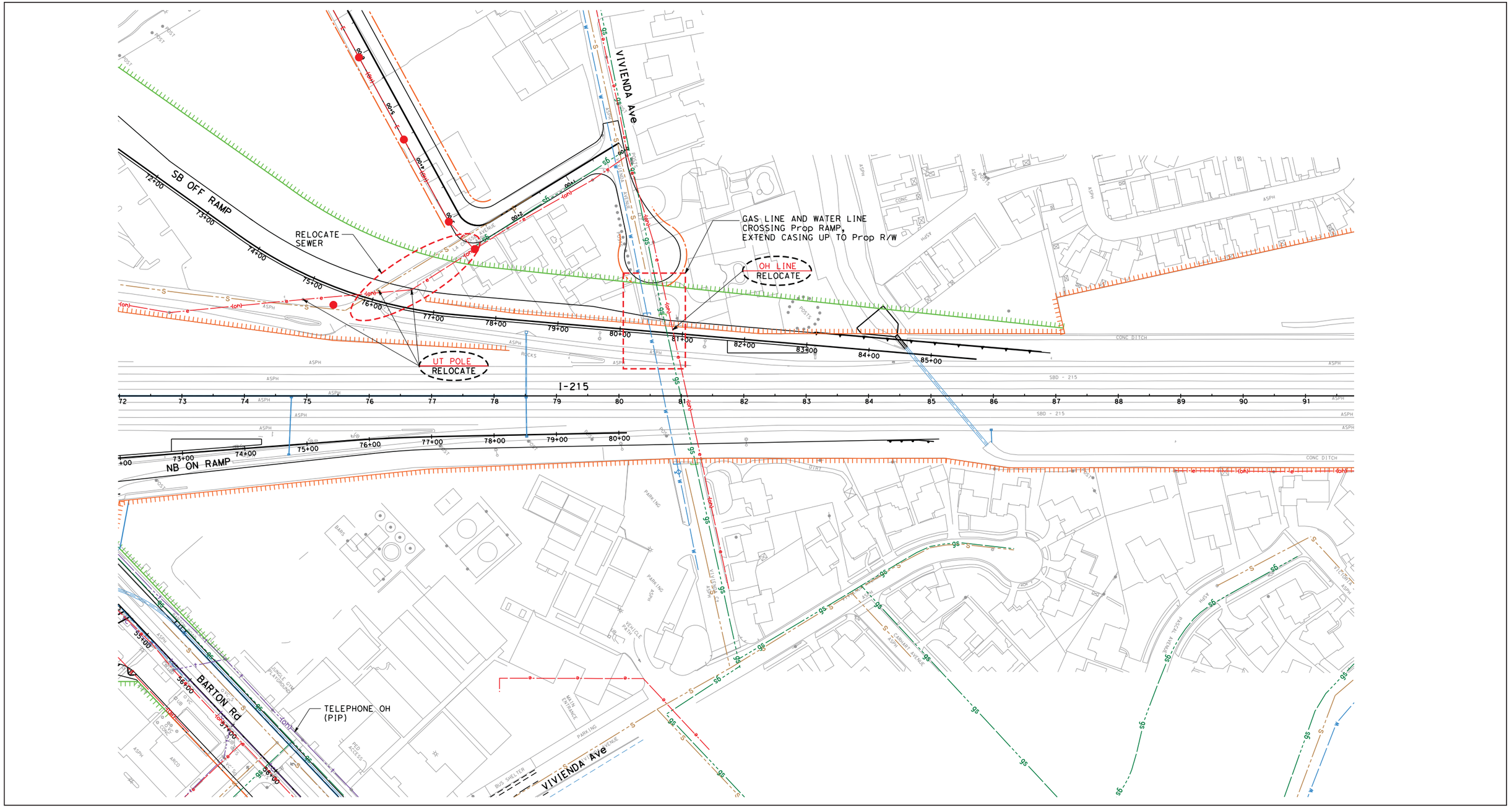

LEGEND

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- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

FIGURE 2.4.1
(Page 4 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 3 Utility Relocation

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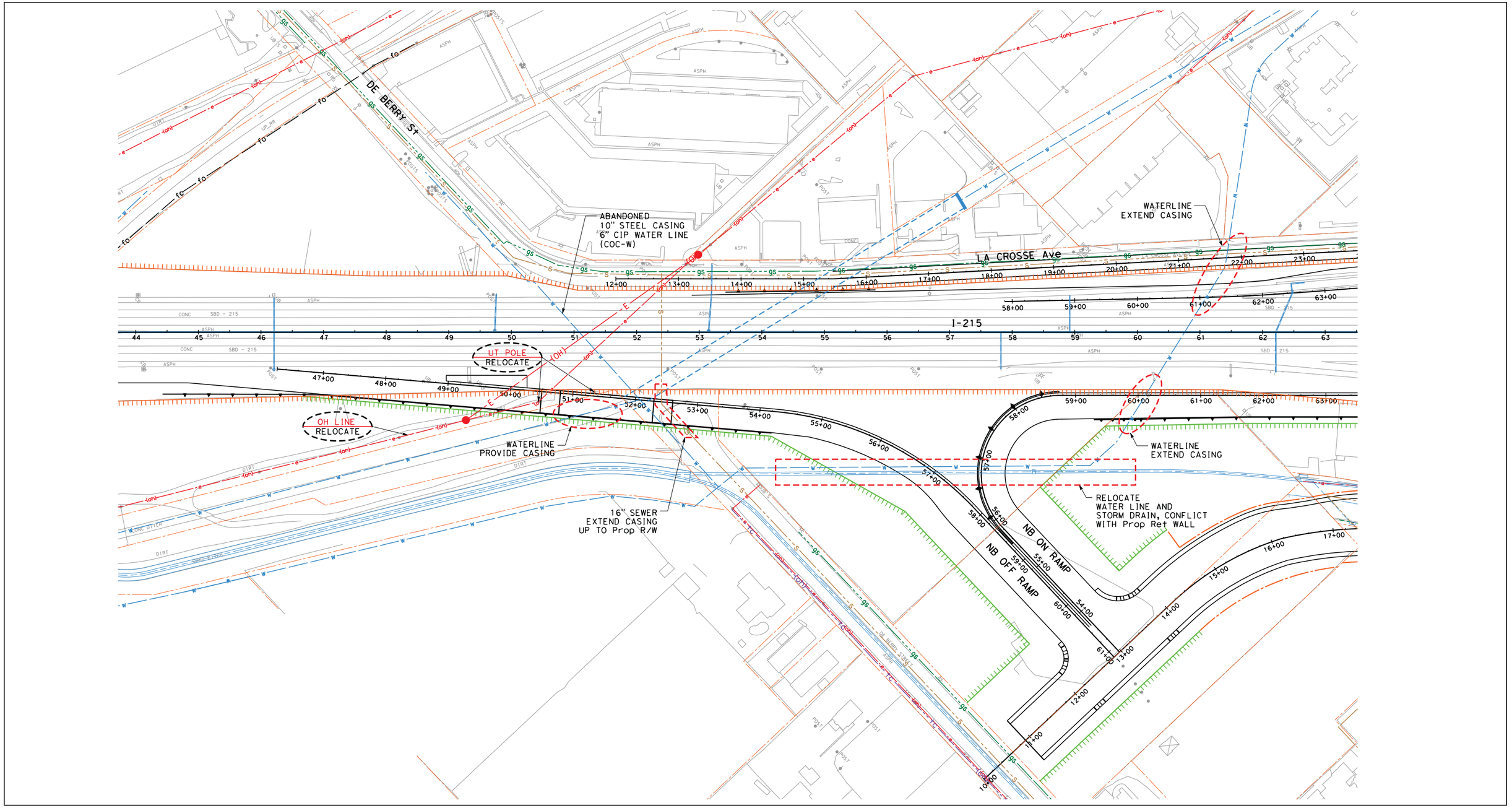

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- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.2
(Page 1 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 6 Utility Relocation

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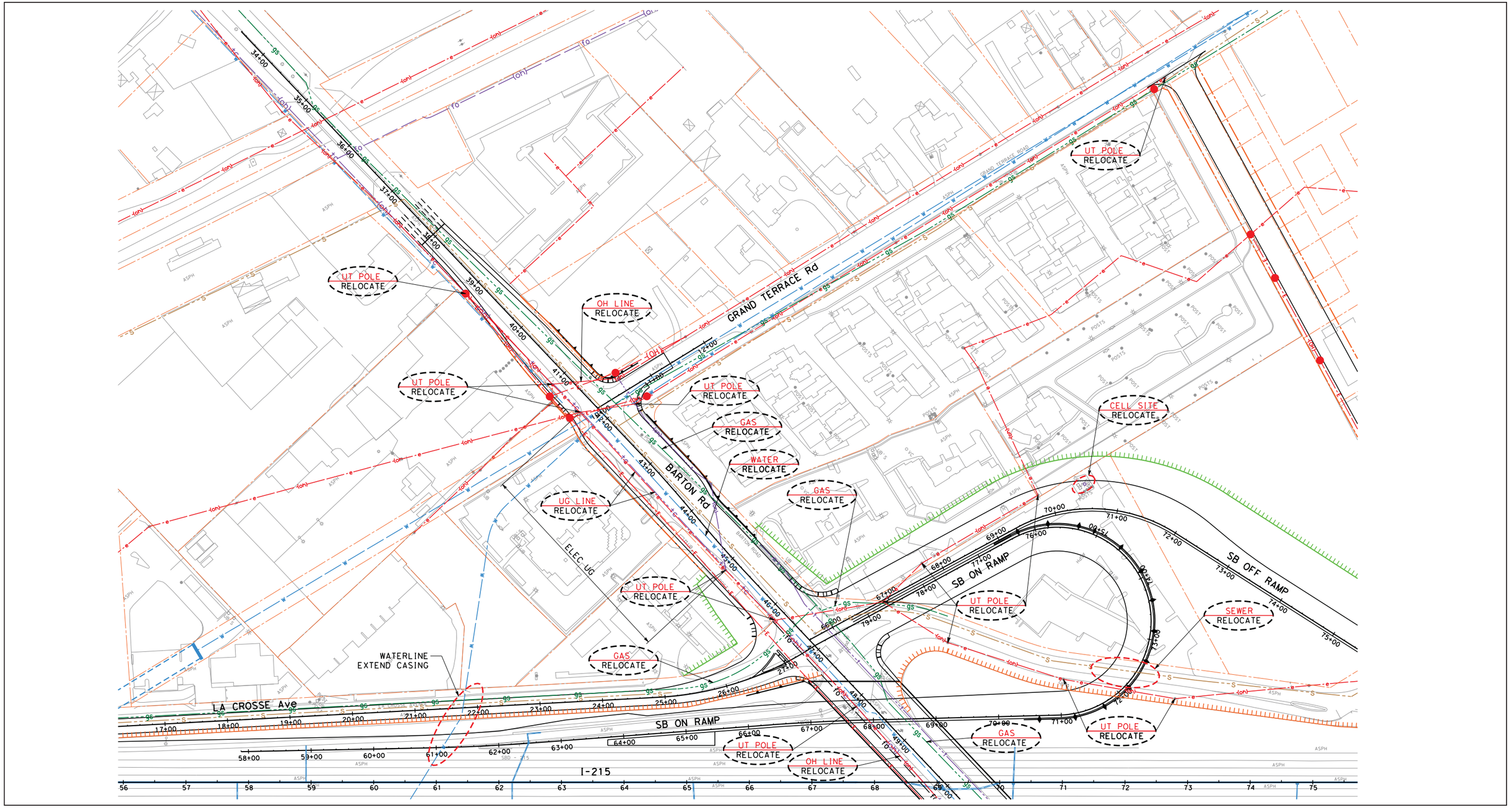

LEGEND

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- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.2
(Page 2 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 6 Utility Relocation

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SB ON RAMP

I-215

NB EXIT RAMP

BARTON Rd

COMMERCE WAY

MICHIGAN Ave

VIVIENDA Ave

WATER LINE RELOCATE

TELEPHONE RELOCATE

UT POLE RELOCATE

OH LINE RELOCATE

UT POLE RELOCATE

ELEC BOX RELOCATE

UT POLE RELOCATE

TELEPHONE RELOCATE

UG LINE RELOCATE (LOWER Elev)

UT POLE ADJUST AND RESET POLE

TELEPHONE RELOCATE

GAS RELOCATE (LOWER Elev)

UT POLE RELOCATE

OH LINE RELOCATE

GAS RELOCATE (LOWER Elev)

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150

FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.2
(Page 3 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 6 Utility Relocation

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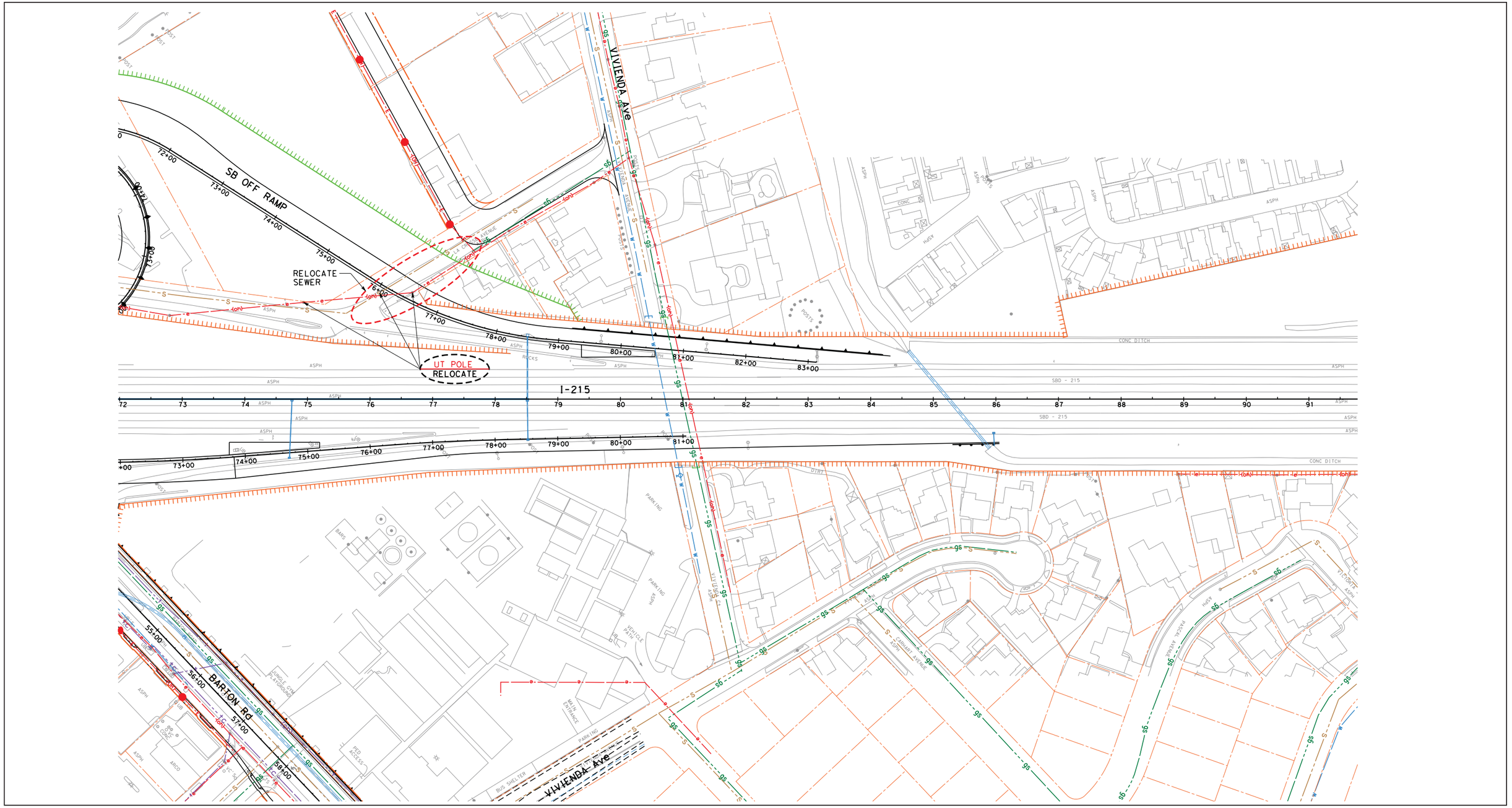

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.2
(Page 4 of 4)

I-215/Barton Road Interchange Improvement Project

Alternative 6 Utility Relocation

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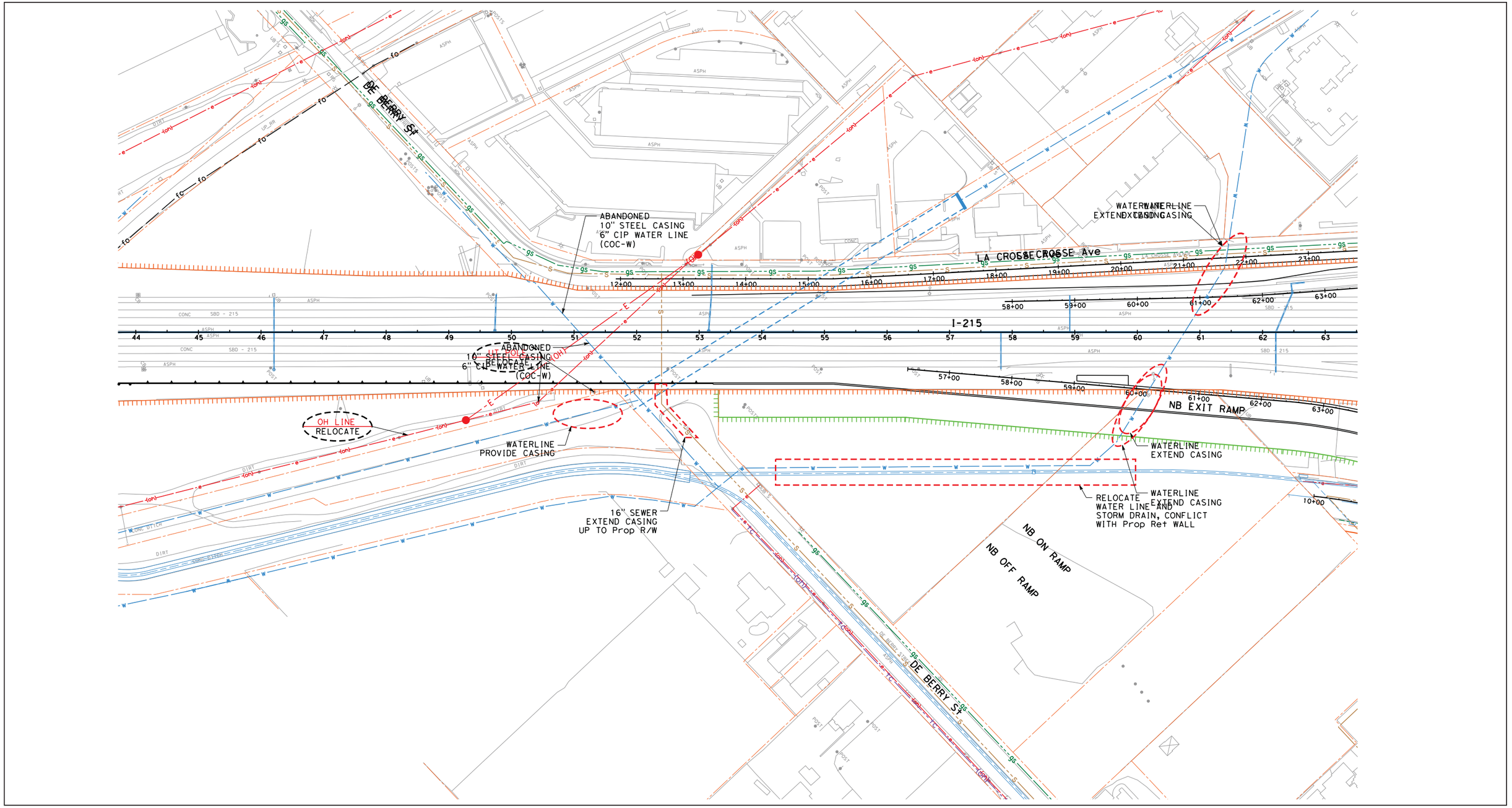

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- Exist ELECTRIC LINE
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- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.3
(Page 1 of 4)

I-215/Barton Road Interchange Improvement Project

Modified Alternative 7 (Preferred Alternative) Utility Relocation

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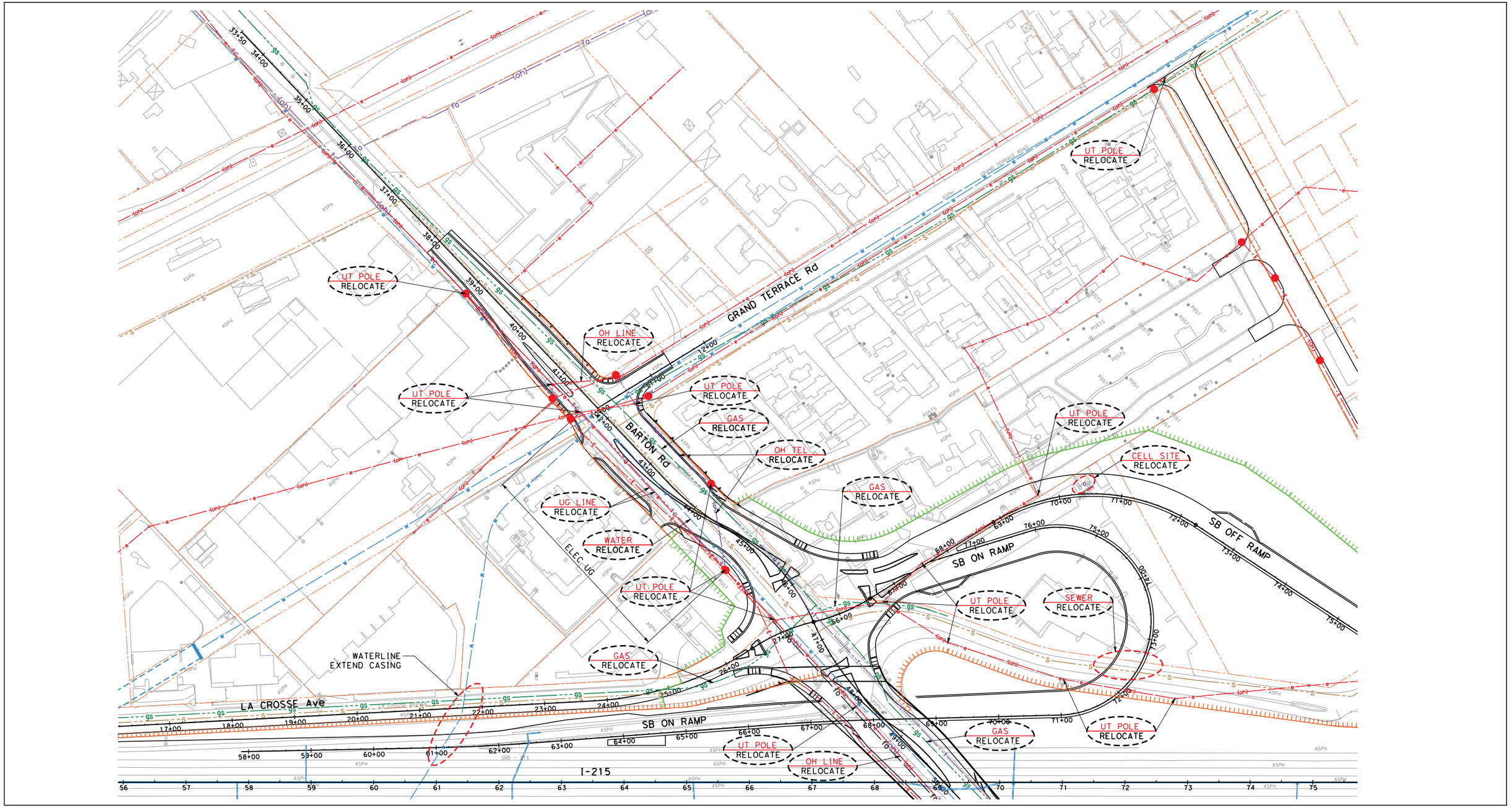

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

N

0 75 150
FEET

SOURCE: AECOM (2/2014)

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FIGURE 2.4.3
(Page 2 of 4)

I-215/Barton Road Interchange Improvement Project
Modified Alternative 7 (Preferred Alternative) Utility Relocation

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SB ON RAMP
I-215
NB ON RAMP
NB EXIT RAMP
BARTON Rd
COMMERCE WAY
MICHIGAN Ave
VIVIENDA Ave
WATER LINE RELOCATE
TELEPHONE RELOCATE
UT POLE RELOCATE
OH LINE RELOCATE
ELEC BOX RELOCATE
UT POLE ADJUST (LOWER Elev)
UG LINE RELOCATE (LOWER Elev)
UT POLE ADJUST AND RESET POLE
GAS RELOCATE (LOWER Elev)
TELEPHONE OH (PIP)
ADJUST ELEC. VAULTS AS NEEDED

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

0 75 150
FEET

SOURCE: AECOM (2/2014)

I:\SBA330\Barton_I-215\G\IS-EA\Alt-7-Mod-Utilities.cdr (2/28/14)

FIGURE 2.4.3
(Page 3 of 4)

I-215/Barton Road Interchange Improvement Project
Modified Alternative 7 (Preferred Alternative) Utility Relocation

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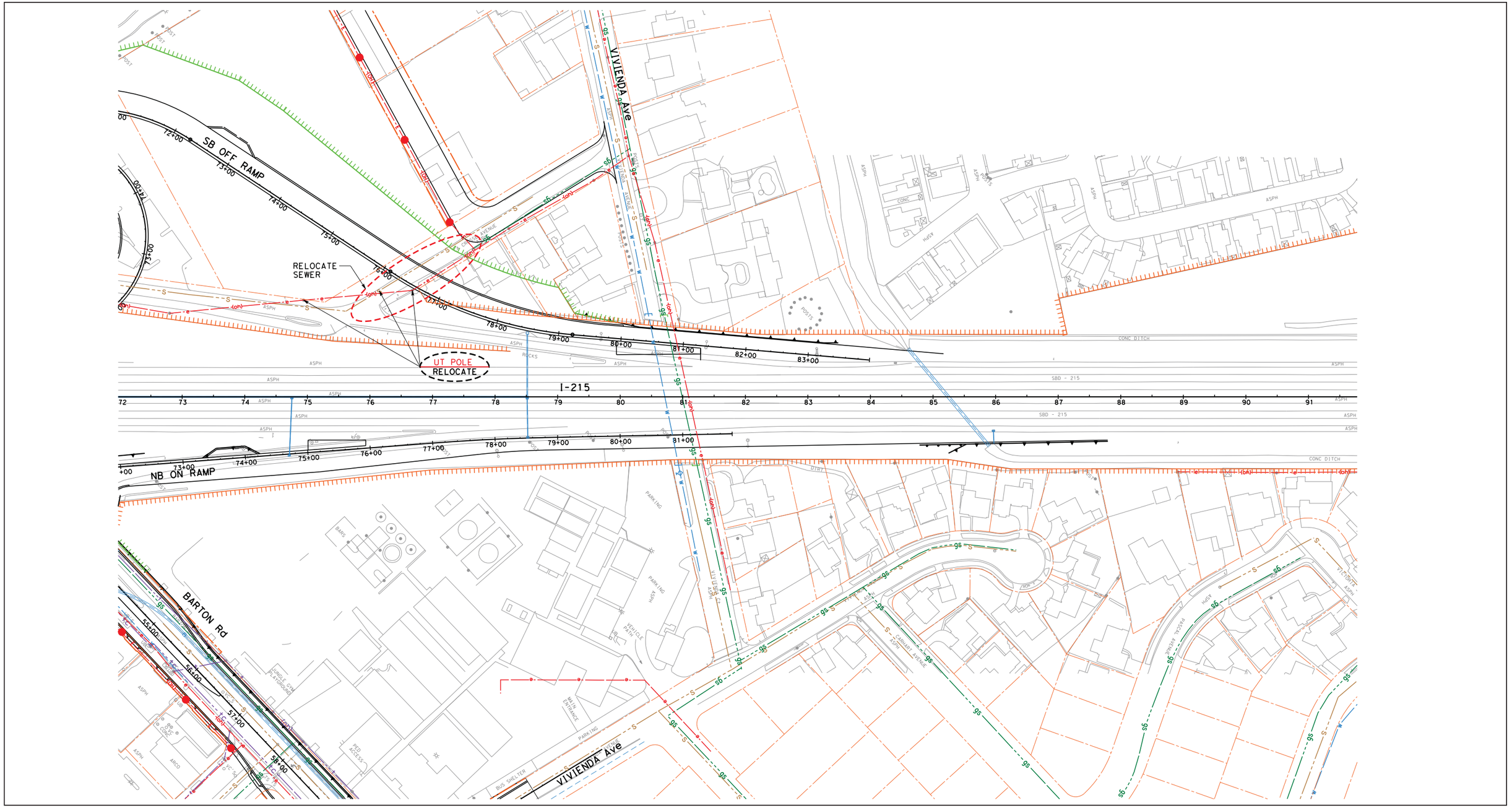

LEGEND

- Exist GAS LINE
- Exist WATER LINE
- Exist ELECTRIC LINE
- Exist TELEMETER LINE
- Exist SEWER LINE
- Exist OVERHEAD LINE
- Exist FIBER OPTIC OVERHEAD LINE
- Exist FIBER OPTIC UNDERGROUND LINE
- Exist TELEPHONE LINE
- PROPOSED OVERHEAD ELECTRICAL LINE
- PROPOSED UNDERGROUND ELECTRICAL LINE
- RELOCATED/PROPOSED UTILITY POLE

N

0 75 150
FEET

SOURCE: AECOM (2/2014)

FIGURE 2.4.3
(Page 4 of 4)

I-215/Barton Road Interchange Improvement Project
Modified Alternative 7 (Preferred Alternative) Utility Relocation

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be substantially minimized through implementation of a Transportation Management Plan (TMP), as specified in Measure TR-1.

2.4.2.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, the No Build Alternative would not result in permanent utility impacts. Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The I-215 Bi-County HOV Gap Closure Project will require relocation of various underground and overhead utilities in the Project area; however, any relocated utility services will be permanently maintained.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Relocation of utilities as a result of the Build Alternatives would occur during the final design or construction phase such that all utility services are permanently maintained. In addition, the Project would not increase the need for domestic water services, wastewater facilities, or solid waste disposal. Therefore, no permanent impacts to utilities would occur. As discussed in Section 2.5, Traffic and Transportation/ Pedestrian and Bicycle Facilities, the Build Alternatives would improve level of service (LOS) at the study area intersections. As a result, implementation of the Project would improve access to the City of Grand Terrace and the City of Colton.

Several Southern California Edison (SCE) facilities would be relocated under each of the Build Alternatives. Common to each of the Build Alternatives, the following facilities would be relocated:

- Pole line along the south side of Barton Road—poles from west of Grand Terrace Road to I-215—would be relocated along the south side of planned Barton Road. An existing underground portion of the facility within this reach may require relocation depending upon extent of actual conflict(s) with the line, based on final design efforts.
- Overhead service connections to parcels north of Barton Road between Grand Terrace Road and I-215 would be relocated. The new service could be supplied by a new pole line on the newly planned local street between Grand Terrace Road and Vivienda Avenue.

- Electrical lines would be placed within large cells in the new overcrossing structure. An overhead electrical shoofly may be needed near the bridge site to provide adequate clearance during construction of the new bridge.
- Pole line along south side of Barton Road east of I-215 would be relocated south of the planned Barton Road.
- SCE underground facilities east of existing Michigan Street would be relocated to the south if conflicts arise between the planned design and existing facilities.
- Existing poles along Michigan Street would be adjusted to account for the planned lower street profile for Commerce Way east of Michigan Street.
- Underground lines within Commerce Way would be lowered to accommodate the planned lower street profile. Electrical facilities affected by Alternative 3 would be relocated south to the new alignment of Commerce Way.
- Poles supporting SCE's high voltage crossing near the intersection of Barton Road/Grand Terrace would be relocated to clear the planned Barton Road widening.
- Poles would be placed within the street right-of-way.
- A few telephone lines and poles that are on poles not owned by SCE would be relocated.

All of the work associated with relocating these facilities is located within the Project area. New facilities will be located within City right-of-way and would be similar to the existing facilities. The disturbance associated with relocating these facilities has been analyzed in each of the technical sections contained in this document, and no impacts were identified.

2.4.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of a TMP, as discussed in detail in Section 2.5, Traffic and Transportation, would minimize temporary construction-related impacts to emergency services.

The following measures would minimize temporary construction-related impacts to utilities:

UES-1 **Utility Protection in Place.** Prior to commencement of construction, all affected utility providers will be contacted to establish exact procedures and specifications for all facilities to be protected in place or relocated during construction to ensure that utility services are not disrupted.

UES-2 **Utility Relocation.** Prior to commencement of construction, the utility providers for utilities requiring relocation will be contacted to inform the utility users in advance about the date and timing of service disruptions.

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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 regulation (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

This section is primarily based on the *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011). The Traffic Operations Analysis studied existing traffic conditions (2009), traffic conditions for 2016, traffic conditions for 2040 (the design horizon year for the Project), and assessed the impact of the Project on traffic conditions. This section is also based on the *Barton Road Interchange Improvement Project: Roundabout Analyses* (August 2013), prepared specifically for Modified Alternative 7. Additionally, the *Traffic Volume Comparison Memorandum* (November 2013) prepared for the Project, is referenced.

The traffic study area for the Interstate 215 (I-215)/Barton Road Interchange Improvement Project includes the freeway mainline, ramps, and several intersections along Barton Road in the vicinity of the interchange as well as adjacent interchanges. In the Project area, I-215 has three mixed-flow lanes in each direction, separated by a

median with a concrete barrier. The existing I-215/Barton Road interchange is a compact diamond interchange with one-lane on- and off-ramps.

Sidewalks are provided along the north side of Barton Road, ending approximately 225 feet (ft) west of the southbound ramps in the Project area. In order to safely traverse the entire east-west length of the Project area along Barton Road, pedestrians currently must follow the existing sidewalks along the north side of Barton Road, crossing two unsignalized "T" intersections (Barton Road/Vivienda Avenue and Barton Road/Grand Terrace Road), which lack crosswalk facilities. Pedestrians must also cross the Barton Road/I-215 ramp intersections. The Barton Road/I-215 northbound on-ramp is not signalized, and the Barton Road/I-215 southbound off-ramp is partially signalized. There are no sidewalks on La Crosse Avenue, Grand Terrace Road, or Vivienda Avenue in the Project area. Michigan Street and La Cadena Drive have sidewalks in some areas, but the sidewalks are not continuous through the Project area.

An existing Class II bicycle lane is located on the eastbound side of Barton Road, east of Michigan Street. The City of Grand Terrace General Plan shows a planned bicycle lane on Barton Road from west of Michigan Street to the western city limit as shown on Figure 2.5.1.

Arterial roadways in the study area include:

- Barton Road
- La Cadena Drive
- Grand Terrace Road
- La Crosse Avenue
- Michigan Street
- Vivienda Avenue
- Commerce Way
- Terrace Avenue

Intersections in the study area include:

- Barton Road/La Cadena Drive.
- Barton Road/Grand Terrace Road. This intersection would be modified under Alternative 3.

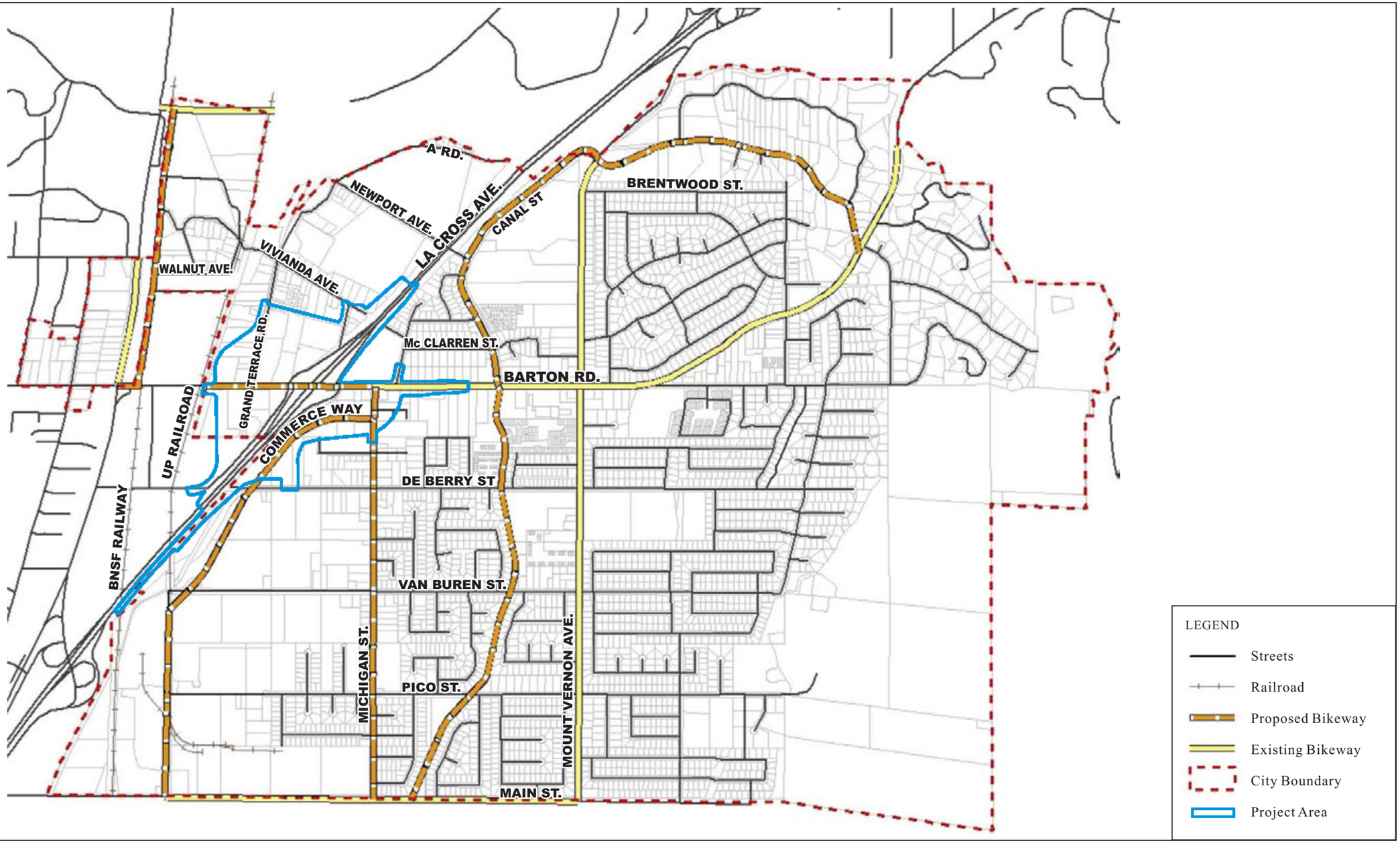

FIGURE 2.5.1

N

0 750 1500
FEET

SOURCE: City of Grand Terrace General Plan, 2010

I:\SBA330\Barton_I-215\G\IS-EA\Grand Terrace GP Bikeways.cdr (3/4/14)

I-215/Barton Road Interchange Improvement Project

City of Grand Terrace Existing and Proposed Bikeway Plan

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- Barton Road/La Crosse Avenue. This intersection would be eliminated under Alternative 3. The Barton Road intersection with the northern segment of La Crosse Avenue would be eliminated under Alternative 6 and Modified Alternative 7.
- Barton Road/I-215 Southbound On-Ramp. This ramp would become a modified cloverleaf for all Build Alternatives.
- Barton Road/I-215 Southbound Off-Ramp. This ramp would be constructed on the outside of the modified cloverleaf on-ramp for all Build Alternatives.
- Barton Road/I-215 Northbound On-Ramp. This ramp would become a modified cloverleaf for Alternative 3, and would undergo a minor alignment change for Alternative 6 and Modified Alternative 7.
- Barton Road/I-215 Northbound Off-Ramp. This ramp would be constructed on the outside of the modified cloverleaf on-ramp for Alternative 3. This ramp would intersect with a realigned Commerce Way for Alternative 6. This ramp would be realigned for Modified Alternative 7.
- Barton Road/Michigan Street. This intersection would be eliminated for all Build Alternatives. Commerce Way would be realigned to intersect with Barton Road for all Build Alternatives.
- Barton Road/Vivienda Avenue.
- Barton Road/Terrace Avenue. This intersection was analyzed for Alternative 6 in 2016, because the southern segment of La Crosse Avenue would intersect with Barton Road in a right-in/right-out configuration. Therefore, vehicles would need to use Barton Road, Terrace Avenue, and De Berry Street to access I-215 to and from properties on the southern segment of La Crosse Avenue. The southern segment of La Crosse Avenue would be removed by the I-215 Bi-County Widening Project, so this intersection was not analyzed in the 2040 condition.

Freeway segments in the study area include:

- Northbound I-215 Iowa Avenue on-ramp to Barton Road off-ramp
- Northbound I-215 Barton Road off-ramp to Barton Road on-ramp
- Northbound I-215 Barton Road on-ramp to Washington Street off-ramp
- Southbound I-215 Washington Street on-ramp to Barton Road off-ramp
- Southbound I-215 Barton Road off-ramp to Barton Road on-ramp
- Southbound I-215 Barton Road on-ramp to La Cadena Drive off-ramp

2.5.2.1 Level of Service Standards

Because there are three other planned freeway projects in the vicinity of the I-215/ Barton Road Interchange Improvement Project that are multijurisdictional and that could influence traffic results for 2016 and/or for 2040, the Project Development Team (PDT) agreed on a common set of analysis parameters for the traffic operations analysis. Those level of service (LOS) parameters and LOS standards are:

- Capacity of a Mixed-Flow Lane: 2,300 vehicles per hour
- Capacity of a High-Occupancy Vehicle Lane: 1,600 vehicles per hour
- Lost Time per Signal Phase: 2 seconds
- Minimum Green Time per Signal Phase: 7 seconds
- Minimum LOS Standard for Freeways: LOS E
- Minimum LOS Standard for Intersections: LOS D

Based on vehicle classification counts conducted at the I-215/Barton Road interchange, the following truck percentages on I-215 were used in the LOS analysis:

- Percentage of trucks during the AM peak hour: 7 percent
- Percentage of trucks during the PM peak hour: 4 percent

2.5.2.2 Existing (2009) Traffic Conditions

Table 2.5.A shows the existing mainline traffic volumes, densities, and LOS during the AM and PM peak hours in the Project area. Traffic counts were recorded for passenger cars, two-axle trucks, three-axle trucks, and four-axle trucks. The trucks were factored into Passenger Car Equivalents (PCEs) that convert traffic volumes to an equivalent number of passenger car volumes based on the types of trucks. As seen in Table 2.5.A, all freeway mainline segments in the Project area currently operate at an acceptable LOS (LOS E or better).

Table 2.5.B shows the existing LOS and delay in seconds at the study area intersections during the AM and PM peak hours. As seen in Table 2.5.B, all study area intersections currently operate at a satisfactory LOS B or C.

Table 2.5.C shows the existing vehicle queue lengths on Barton Road at the left-turn lanes for the southbound and northbound ramps onto I-215. For westbound traffic on Barton Road, the left-turn lane at the southbound ramps has inadequate queuing length during both the AM and PM peak hours. Long queues result in long delays for through and left-turning traffic traveling through the interchange.

Table 2.5.A Existing (2009) Mainline LOS

Freeway Segment	AM Peak Hour			PM Peak Hour		
	V	Density	LOS	V	Density	LOS
Northbound						
Iowa Avenue On-Ramp to Barton Road Off-Ramp	4,876	29.6	D	5,685	35.4	E
Barton Road Off-Ramp to Barton Road On-Ramp	4,511	27.3	D	5,271	31.9	D
Barton Road On-Ramp to Washington Street Off-Ramp	4,881	29.7	D	5,677	35.4	E
Southbound						
Washington Street On-Ramp to Barton Road Off-Ramp	6,069	40.9	E	5,276	31.9	D
Barton Road Off-Ramp to Barton Road On-Ramp	5,736	36.8	E	4,915	29.4	D
Barton Road On-Ramp to La Cadena Drive Off-Ramp	6,198	42.8	E	5,346	32.5	D

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).
Note: LOS criteria are provided in the HCM, and are based on density, i.e., the quantity of vehicles within a freeway segment.

Table 2.5.B Existing (2009) Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay	V/C	LOS	Delay	V/C
Barton Road/La Cadena Drive	B	14.0	0.35	B	16.0	0.53
Barton Road/Grand Terrace Road[1]	B	14.8	-	C	15.8	-
Barton Road/La Crosse Avenue[1]	B	13.1	-	B	14.5	-
Barton Road/I-215 SB Ramps	B	15.1	0.66	C	25.0	0.82
Barton Road/I-215 NB Ramps	B	12.9	0.52	B	11.8	0.52
Barton Road/Michigan Street	B	12.5	0.52	B	10.0	0.50
Barton Road/Vivienda Avenue[1]	B	14.0	-	B	14.5	-

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).
[1] V/C is not applicable for intersections with a stop sign instead of a traffic signal.
Note: Delay = Average Vehicle Delay (seconds)
V/C = Volume-to-Capacity Ratio

Table 2.5.C Existing (2009) Intersection Queue Lengths

Intersection	Available Storage (ft)	95th Percentile Queue (ft)		Queue Exceeds Available Storage?
		AM Peak Hour	PM Peak Hour	
Barton Road/I-215 SB Ramps: WB left-turn lane	120	213	297	Yes
Barton Road/I-215 NB Ramps: EB left-turn lane	150	76	89	No

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).

Existing AM and PM peak-hour LOS for the Barton Road/I-215 interchange and adjacent interchange ramp influence areas are summarized in Table 2.5.D. As seen in Table 2.5.D, all freeway ramp junctions currently operate at a satisfactory LOS (E or better), with the exception of the I-215 southbound Washington Street off-ramp in the AM peak hour, which is operating at LOS F.

Table 2.5.D Existing (2009) Freeway Ramp LOS

Location	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Northbound								
Iowa Avenue Off-Ramp	241	54.6	27.1	C	289	54.5	31.4	D
Iowa Avenue On-Ramp	1,004	55.0	29.3	D	909	54.0	32.7	D
Barton Road Off-Ramp	365	54.3	31.0	D	414	54.2	34.0	D
Barton Road On-Ramp	370	56.0	27.5	C	406	55.0	30.9	D
Mt. Vernon Avenue On-Ramp	663	55.0	29.8	D	653	53.0	33.1	D
Mt. Vernon Avenue Off-Ramp	847	53.2	31.9	D	826	53.3	34.8	D
Southbound								
Washington Street Off-Ramp	1,018	52.9	38.6	F	1,316	52.2	35.6	E
Washington Street On-Ramp	613	53.0	34.2	D	973	55.0	30.8	D
Barton Road Off-Ramp	333	54.4	36.1	E	361	54.4	32.8	D
Barton Road On-Ramp	462	52.0	34.4	D	431	55.0	29.6	D
La Cadena Drive Off-Ramp	188	54.7	36.2	E	291	54.5	31.1	D
La Cadena Drive On-Ramp	354	52.0	34.8	D	285	56.0	27.4	C

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).
[1] Speed in ramp influence area. All ramps are a single lane at the gore point (where the ramp meets the mainline).
Bold indicates unsatisfactory LOS.

2.5.3 Environmental Consequences

2.5.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, the No Build Alternative would not result in temporary impacts related to traffic, transportation, or bicycle and pedestrian facilities.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Traffic delays are expected during construction of the new ramps and Barton Road overcrossing, as well as realignment of local streets, and modifications to local intersections. Construction of the Project would result in temporary delays on Barton Road, La Crosse Avenue, Grand Terrace Road, Commerce Way, Vivienda Avenue, Michigan Street, the I-215 mainline, and the I-215 on- and off-ramps. No extended ramp closures and no full local road closures are anticipated.

Because the Barton Road overcrossing would stay at its existing alignment, it is planned that the new structure be built in two stages. The first stage would include:

- Demolition of half of the existing structure
- Construction of half of the new structure while maintaining one lane of traffic in each direction on the remaining half of the existing structure
- Construction of the ramps, northbound auxiliary lane, and retaining walls
- Improvements to local streets

The second stage would include:

- Demolition of the second half of the overcrossing structure
- Construction of the remaining half of the overcrossing structure
- Traffic signal work
- Intersection modifications/improvements
- Completion of the reconstructed bridge connection to each end of Barton Road

During each stage, a single 5 ft wide sidewalk would be provided for temporary access on Barton Road.

Construction would be limited to off-peak hours to minimize impacts to the I-215 mainline and interchange area during ongoing construction, if necessary. Temporary nighttime closures of mainline lanes and ramps may be required during construction. During ramp closures at Barton Road, the I-215/Iowa Avenue/La Cadena Drive and I-215/Mount Vernon Avenue/Washington Street interchanges would be available as alternate access points to and from the I-215 mainline. La Cadena Drive and Mount Vernon Avenue would provide north-south access to Barton Road in the Project vicinity.

A Transportation Management Plan (TMP) with traffic control plans and related specifications for the Project is necessary to avoid and/or minimize circulation and delay impacts. These details are specified later in this section in Measure TR-1. With implementation of Measure TR-1, temporary transportation-related construction impacts of the Build Alternatives would not be substantial.

2.5.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

Analysis for 2016

A *Traffic Volume Comparison Memorandum* (November 2013) was prepared to address whether the previously approved 2016 traffic volumes (in conjunction with

when 2016 was the planned Opening Year for the Project) remain applicable for use as the basis for traffic analysis with the Project's planned opening year changed to 2018. The conclusion in this regard, included in the memorandum:

> Based on the traffic count comparison conducted in June of 2012, traffic volumes were slightly lower than those collected in 2009. The decrease in the existing volumes would be offset by the Project's revised opening year of 2018. Therefore, the "opening" year 2016 volumes in the Traffic Operations Analysis are appropriate to use as the updated 2018 opening year volumes.

The *Traffic Volume Comparison Memorandum* (November 2013) received concurrence on November 22, 2013.

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Section 1.1.2 of this Environmental Document, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The I-215 Bi-County HOV Lane Gap Closure Project includes one HOV lane in each direction within the Project area, which increases the capacity of I-215.

Table 2.5.E shows the 2016 AM and PM peak-hour traffic volumes, density, and LOS for the I-215 mainline under Alternative 1 (No Build Alternative). As shown in Table 2.5.E, all freeway segments in the study area are projected to operate at satisfactory LOS during the AM and PM peak hours under the No Build Alternative.

The 2016 AM and PM peak-hour LOS for the study area intersections under Alternative 1 (No Build Alternative) are summarized in Table 2.5.F. All study area intersections are projected to operate at satisfactory LOS with the exception of the Barton Road/Grand Terrace Road intersection in the AM and PM peak hours and the Barton Road/I-215 southbound ramps intersection in the PM peak hour.

Table 2.5.G shows the projected 2016 AM and PM peak-hour queue lengths for Alternative 1 (No Build) conditions. Under the 2016 No Build condition, the queue length for the westbound left-turn lane at the Barton Road/I-215 southbound ramps intersection would exceed the length of the queue pocket. Long queues will cause long delays for both through traffic and left-turning traffic traveling through the interchange.

Table 2.5.E Alternative 1 2016 Freeway Mainline LOS

Mainline Segments	AM Peak Hour					PM Peak Hour				
	HOV Vol	MF Vol	Mixed Flow			HOV Vol	MF Vol	Mixed Flow		
			Speed[1]	Density (pc/mi/ln)	LOS			Speed[1]	Density (pc/mi/ln)	LOS
Northbound										
* Iowa Avenue On-Ramp to Barton Road Off-Ramp	737	5,250	59.0	32.3	D	881	6,098	54.5	40.0	E
* Barton Road Off-Ramp to Barton Road On-Ramp	782	4,764	59.9	28.9	D	874	5,552	58.1	34.2	D
* Barton Road On-Ramp to Washington Street Off-Ramp	782	5,308	58.8	32.8	D	874	6,101	54.5	40.1	E
Southbound										
* Washington Street On-Ramp to Barton Road Off-Ramp	935	5,990	54.7	39.8	E	794	5,577	58.0	34.4	D
* Barton Road Off-Ramp to Barton Road On-Ramp	1,003	5,502	58.0	34.5	D	909	4,960	59.8	29.7	D
* Barton Road On-Ramp to La Cadena Dr. Off-Ramp	1,003	6,140	53.2	41.9	E	909	5,578	58.0	34.4	D

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

[1] Average passenger-car speed.

Note: LOS criteria are based on density.

***** As noted in the discussion included in Section 2.5.3.2 of this Environmental Document, a *Traffic Volume Comparison Memorandum* (November 2013), prepared to address whether previously approved 2016 traffic volumes (in conjunction with when 2016 was the planned Opening Year for the Project) are appropriate for use as the basis for traffic analysis for the Project's revised planned opening year changing to 2018, concluded:

> Based on the traffic count comparison conducted in June of 2012, traffic volumes were slightly lower than those collected in 2009. The decrease in the existing volumes would be offset by the Project's revised opening year of 2018. Therefore, the "opening" year 2016 volumes in the Traffic Operations Analysis are appropriate to use as the updated 2018 opening year volumes.

Table 2.5.F Alternative 1 2016 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
*1. Barton Road/La Cadena Drive	B	11.4	0.52	C	24.3	0.86
*2. Barton Road/Grand Terrace Road[1]	F	69.1	-	F	54.4	-
*3. Barton Road/La Crosse Avenue[1]	B	13.9	-	C	18.7	-
*4. Barton Road/I-215 SB Ramps	C	26.8	0.83	F	98.9	1.02
*5. Barton Road/I-215 NB Ramps	B	15.1	0.65	C	28.4	0.86
*6. Barton Road/Michigan Street	B	14.6	0.59	B	17.2	0.69
*7. Barton Road/Vivienda Avenue[1]	C	19.1	-	C	18.1	-
*8. Barton Road/Terrace Avenue[1]	C	16.5	-	C	17.2	-

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

[1] Delay for stop-controlled approach; v/c not applicable

[2] Per the CMP, V/C > 1 is considered LOS F regardless of delay.

***** See note included at bottom of Table 2.5.E above.

Table 2.5.G Alternative 1 2016 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
* Barton Road/I-215 SB Ramps: WB left-turn lane	120	478	120	231
* Barton Road/I-215 NB Ramps: EB left-turn lane	150	77	150	91

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).
***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

Table 2.5.H summarizes the projected 2016 AM and PM peak-hour LOS for the I-215/Barton Road interchange freeway ramp junction influence areas under Alternative 1 (No Build). All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS.

Table 2.5.H Alternative 1 2016 Freeway Ramp LOS

Location	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Northbound								
* Iowa Avenue Off-Ramp	349	54.4	29.1	D	380	54.3	32.6	D
* Iowa Avenue On-Ramp	1074	54.3	31.4	D	1100	51.5	35.3	E
* Barton Road Off-Ramp	442	54.2	32.8	D	553	53.9	36.1	E
* Barton Road On-Ramp	544	55.0	30.1	D	549	53.0	33.7	D
* Mt. Vernon Avenue Off-Ramp	1047	52.8	34.1	D	954	53.0	36.7	E
* Mt. Vernon Avenue On-Ramp	670	55.6	28.7	D	655	53.8	32.3	D
Southbound								
* Washington Street Off-Ramp	1,062	52.8	37.7	E	1,415	52.0	36.2	E
* Washington Street On-Ramp	686	52.7	34.0	D	1,077	53.5	32.6	D
* Barton Road Off-Ramp	421	54.2	35.8	E	503	54.0	33.9	D
* Barton Road On-Ramp	639	52.2	34.6	D	618	54.5	31.3	D
* La Cadena Drive Off-Ramp	410	54.2	36.4	E	583	53.9	34.0	D
* La Cadena Drive On-Ramp	531	52.1	34.9	D	438	55.1	30.1	D

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).
[1] Speed in ramp influence area. All ramps are a single lane at the gore point.
***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

Analysis for 2040

Table 2.5.I summarizes the projected 2040 (the design horizon year for the Project) AM and PM peak-hour LOS for the No Build Alternative for the study area freeway segments. As discussed in Chapter 1, for 2040, the No Build Alternative includes the I-215 Bi-County Improvement Project, the I-215/Mount Vernon/Washington Street

Table 2.5.I Alternative 1 2040 Freeway Mainline LOS

Mainline Segments	AM Peak Hour					PM Peak Hour				
	HOV Vol	MF Vol	Mixed Flow			HOV Vol	MF Vol	Mixed Flow		
			Speed[1]	Density (pc/mi/ln)	LOS			Speed[2]	Density (pc/mi/ln)	LOS
Northbound										
Iowa Avenue On-Ramp to Barton Road Off-Ramp[3]	1,381	8,417	59.5	30.8	D	1,553	9,863	55.9	37.9	E
Barton Road Off-Ramp to Barton Road On-Ramp	1,381	7,711	56.3	37.3	E	1,553	8,928	-	-	F[3]
Barton Road On-Ramp to Washington Street Off-Ramp	1,528	8,660	59.1	31.9	D	1,710	9,692	56.6	36.7	E
Southbound										
Washington Street On-Ramp to Barton Road Off-Ramp	1,521	8,342	59.6	30.5	D	1,568	8,560	59.5	30.9	D
Barton Road Off-Ramp to Barton Road On-Ramp	1,521	7,639	56.6	36.7	E	1,568	7,670	57.0	36.1	E
Barton Road On-Ramp to La Cadena Drive Off-Ramp	1,531	8,676	59.1	32.0	D	1,518	8,604	59.4	31.1	D

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

[1] Average passenger-car-speed.

[2] Freeway is over capacity during peak 15-minute period. Based on a peak-hour factor of 0.98 and a capacity of 2,350 vehicles per hour for a mixed-flow lane (per HCM), the LOS for this freeway segment will be E.

[3] This segment is a weaving segment in Alternative 6.

Interchange Improvement Project, and the I-215 Bi-County HOV Lane Gap Closure Project. Table 2.5.I shows that all freeway segments in the study area are projected to operate at satisfactory LOS in 2040 with the exception of the northbound segment on northbound I-215 from the Barton Road off-ramp to the Barton Road on-ramp.

Table 2.5.J shows that all study area intersections for 2040 under the No Build Alternative are projected to operate at unsatisfactory LOS F for both the AM and PM peak hours, with the exception of Barton Road/La Cadena Drive, which is projected to operate at satisfactory LOS in the AM peak hour. Essentially, all but one of the intersections would be at complete failure.

Table 2.5.J Alternative 1 2040 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
1. Barton Road/La Cadena Drive	C	31.4	0.94	F	169.3	1.51
2. Barton Road/Grand Terrace Road[1]	F	>500	N/A	F	>500	N/A
3. Barton Road/La Crosse Avenue[1]	F	223.4	N/A	F	>500	N/A
4. Barton Road/I-215 Southbound Ramps	F	184.8	1.4	F	290.6	1.7
5. Barton Road/I-215 Northbound Ramps	F	99.7	1.31	F	251.3	1.66
6. Barton Road/Michigan Street	F	101.7	1.2	F	135.7	1.32
7. Barton Road/Vivienda Avenue[1]	F	434.9	N/A	F	>500	N/A

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

[1] Delay for stop-controlled approach; v/c not applicable

Table 2.5.K shows the projected 2040 intersection queue lengths for the No Build Alternative. Under the No Build Alternative, the westbound left-turn lane at the intersection of Barton Road and the I-215 southbound ramps would continue to have inadequate queuing distances for both the AM and PM peak hours. These long queues in 2040 would increase delays for both through traffic and left-turning traffic traveling through the interchange.

Table 2.5.K Alternative 1 2040 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
Barton Road/I-215 SB Ramps: WB left-turn lane	120	491	120	252
Barton Road/I-215 NB Ramps: EB left-turn lane	150	102	150	89

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

Table 2.5.L shows the projected 2040 freeway ramp AM and PM peak-hour LOS under the No Build Alternative for the I-215/Barton Road interchange and adjacent interchange ramp influence areas. The I-215 Bi-County Improvement Project would improve the ramp merge/diverge areas, and all freeway ramp junctions are projected to operate at satisfactory LOS.

Table 2.5.L Alternative 1 2040 Freeway Ramp LOS

Location	AM Peak Hour				PM Peak Hour			
	Ramp Volume	V/C	Density (pc/mi/ln)	LOS	Ramp Volume	V/C	Density (pc/mi/ln)	LOS
Northbound								
Iowa Avenue Off-Ramp	720	0.17	6.9	A	692	0.16	6.5	A
Iowa Avenue On-Ramp	1,312	0.62	25.1	C	1,754	0.82	33.0	D
Barton Road Off-Ramp	706	0.17	6.8	A	935	0.22	8.8	A
Barton Road On-Ramp	1,095	0.52	21.0	C	922	0.43	17.3	B
Washington Street Off-Ramp	1,731	0.41	16.6	B	1,391	0.32	13.1	B
Washington Street On-Ramp	1,678	0.80	32.1	D	1,338	0.62	25.1	C
Southbound								
Washington Street Off-Ramp	1,212	0.29	11.6	B	1,755	0.41	16.5	B
Washington Street On-Ramp	935	0.45	17.9	B	1,432	0.67	26.9	C
Barton Road Off-Ramp	703	0.17	6.7	A	890	0.21	8.4	A
Barton Road On-Ramp	1,047	0.50	20.1	C	883	0.41	16.6	B
La Cadena Drive Off-Ramp	1,169	0.28	11.2	B	1,582	0.37	14.9	B
La Cadena Drive On-Ramp	1,136	0.54	21.8	C	964	0.45	18.1	B

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

Alternative 3 (Partial Cloverleaf Interchange)

Analysis for 2016

Alternative 3 would not add additional capacity to the freeway mainline beyond that added by the I-215 Bi-County HOV Lane Gap Closure Project. As a result, the freeway LOS for 2016 under Alternative 3 would be the same as those shown earlier in Table 2.5.E for the No Build Alternative (Alternative 1). All freeway segments in the study area are projected to operate at satisfactory LOS during the AM and PM peak hours for 2016.

Table 2.5.M shows the projected 2016 AM and PM peak-hour intersection LOS for Alternative 3. All study area intersections are projected to operate at satisfactory LOS in both the AM and PM peak hours.

Table 2.5.M Alternative 3 2016 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
*1. Barton Road/La Cadena Drive	B	12.1	0.51	C	20.8	0.87
*2. Barton Road/Grand Terrace Road	A	6.0	0.33	A	2.9	0.30
*3. Barton Road/La Crosse Avenue	Does not Exist[1]					
*4. Barton Road/I-215 SB Ramps	A	6.4	0.35	A	6.8	0.33
*5. Barton Road/I-215 NB Ramps	A	6.7	0.38	A	8.9	0.46
*6. Barton Road/Michigan Street	Does not Exist[2]					
*7. Barton Road/Vivienda Avenue	B	15.2	0.52	B	13.9	0.51

Source: *Interstate 215/Barton Road Revised Traffic Operations Analysis* (December 2011).

[1] This intersection is eliminated, only with Alternative 3. As noted in the discussion included in Section 2.5.3.2 of this Environmental Document, a *Traffic Volume Comparison Memorandum* (November 2013), prepared to address whether previously approved 2016 traffic volumes (in conjunction with when 2016 was the planned Opening Year for the Project) are appropriate for use as the basis for traffic analysis for the Project's revised planned opening year changing to 2018, concluded, "…opening" year 2016 volumes in the Traffic Operations Analysis are appropriate to use as the updated 2018 opening year volumes." To confirm, the "Does Not Exist" condition would not occur until the project opened in 2018, and would only occur as referenced in this Table, if Alternative 3 were constructed. However, as discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction.

[2] This intersection is replaced by the new Commerce Way/Barton Road intersection. To confirm, as noted above, the "Does Not Exist" condition would not occur until the Project opened in 2018. As discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction. The Barton Road/Michigan Street intersection will be replaced by the new Commerce Way/Barton Road intersection when the Project opens in 2018.

***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

Table 2.5.N shows the projected 2016 intersection queue lengths for the AM and PM peak hours for Alternative 3 for the I-215/Barton Road interchange southbound and northbound ramps. The queue length would not exceed the available storage for either the northbound or the southbound I-215 ramps.

Table 2.5.N Alternative 3 2016 Intersection Queue Lengths

Intersection	Available Storage (ft)	95th Percentile Queue (ft)		Queue Exceed Available Storage?
		AM Peak Hour	PM Peak Hour	
* Barton Road/I-215 SB Ramps: EB left-turn lanes	220	20	41	No
* Barton Road/I-215 NB Ramps: WB left-turn lanes	220	58	125	No

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).
***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

The ramp merge/diverge areas are similar in each of the alternatives, except for the Barton Road northbound off-ramp. Under the Build Alternatives, a second lane would be added to the Barton Road northbound off-ramp. Therefore, the ramp LOS for 2016 under Alternative 3 would be the same as shown in Table 2.5.H for the No Build Alternative except for the Barton Road northbound off-ramp, which would operate at LOS B in both peak hours. All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS for 2016.

The freeway mainline traffic operations are similar in each of the alternatives, except for the northbound I-215 segment between the Iowa Avenue on-ramp and Barton Road off- ramp. Under the Build Alternatives, an auxiliary lane would be added to this segment, which improves the LOS from D to C for 2016.

Analysis for 2040

Alternative 3 would not add additional capacity to the freeway mainline beyond that added by the I-215 Bi-County HOV Lane Gap Closure Project and the I-215 Bi-County Improvement Project. As a result, the freeway LOS for 2040 under Alternative 3 would be the same as shown in Table 2.5.I for the No Build Alternative. All freeway segments in the study area are projected to operate at satisfactory LOS during the AM and PM peak hours in 2040 with the exception of northbound I-215 between the Barton Road off-ramp and the Barton Road on-ramp. The northbound section of the I-215 from the Barton Road off-ramp to the Barton Road on-ramp is projected to operate at unsatisfactory LOS in the PM peak hour.

Table 2.5.O summarizes the projected 2040 AM and PM peak-hour LOS for the study area intersections under Alternative 3. As shown in Table 2.5.O, all intersections in the Project area are projected to operate at satisfactory LOS, with the exception of

Table 2.5.O Alternative 3 2040 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
1. Barton Road/La Cadena Drive	D	35.5	0.97	F	163.7	1.49
2. Barton Road/Grand Terrace Road	A	6.3	0.60	A	5.4	0.60
3. Barton Road/La Crosse Avenue	Does not Exist[1]					
4. Barton Road/I-215 SB Ramps	B	14.6	0.68	B	12.9	0.61
5. Barton Road/I-215 NB Ramps	A	9.5	0.71	B	13.7	0.83
6. Barton Road/Michigan Street	Does not Exist[2]					
7. Barton Road/Vivienda Avenue	D	45.7	0.91	D	38.8	0.90

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).

[1] The southern segment of La Crosse Avenue would be removed by the I-215 Bi-County Improvement Project.

[2] This intersection is replaced by the new Commerce Way/Barton Road intersection.

Barton Road/La Cadena Drive, which is projected to operate at unsatisfactory LOS in the PM peak hour. This deficiency is not a result of Alternative 3 however, as this intersection also operates at unsatisfactory LOS in the PM peak hour for 2040 in the No Build Condition. Alternative 3 would reduce the delay at that intersection slightly compared to the No Build Alternative. To achieve a satisfactory LOS at this intersection located in the City of Colton, La Cadena Drive would need to be widened to six lanes. The City would need to conduct widening of La Cadena Drive as a separate project.

Table 2.5.P shows the projected 2040 intersection queue lengths for Alternative 3 for the I-215/Barton Road interchange southbound and northbound ramps. The queue lengths would not exceed the available storage for the northbound or southbound ramps.

Table 2.5.P Alternative 3 2040 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
Barton Road/I-215 SB Ramps: EB left-turn lane	220	53	220	85
Barton Road/I-215 NB Ramps: WB left-turn lane	220	156	220	181

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations* Analysis (December 2011).

The ramp merge/diverge areas are similar in each of the Build Alternatives, and the ramp LOS for 2040 under Alternative 3 would be the same as shown earlier in

Table 2.5.L for the No Build Alternative. All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS in 2040.

Alternative 6 (Modified Cloverleaf Interchange)

Analysis for 2016

Similar to Alternative 3, Alternative 6 would not add additional capacity to the freeway mainline beyond that added by the I-215 Bi-County HOV Lane Gap Closure Project. Accordingly, the freeway LOS for 2016 under Alternative 6 would be the same as shown earlier in Table 2.5.E for the No Build Alternative. All freeway segments in the study area are projected to operate at satisfactory LOS during the AM and PM peak hours.

Table 2.5.Q summarizes the projected 2016 AM and PM peak-hour LOS for Alternative 6 for the study area intersections. All intersections in the study area are projected to operate at satisfactory LOS.

Table 2.5.Q Alternative 6 2016 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
*1. Barton Road/La Cadena Drive	B	11.8	0.51	C	22.4	0.88
*2. Barton Road/Grand Terrace Road	A	6.4	0.31	A	3.2	0.50
*3. Barton Road/La Crosse Avenue	Does Not Exist[1]					
*4. Barton Road/I-215 SB Ramps	B	14.1	0.39	C	21.2	0.39
*5. Commerce Way/I-215 NB Ramps	B	12.7	0.39	B	12.8	0.44
*6. Barton Road/Michigan Street	Does Not Exist[2]					
*7. Barton Road/Vivienda Avenue	B	19.9	0.50	B	19.2	0.55
*8. Barton Road/Terrace Avenue	C	18.9	-[3]	C	20.9	-

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).

[1] This intersection would be modified such that only the southern segment of La Crosse Avenue would remain. As noted in the discussion included in Section 2.5.3.2 of this Environmental Document, a *Traffic Volume Comparison Memorandum* (November 2013), prepared to address whether previously approved 2016 traffic volumes (in conjunction with when 2016 was the planned Opening Year for the Project) are appropriate for use as the basis for traffic analysis for the Project's revised planned opening year changing to 2018, concluded, "…opening" year 2016 volumes in the Traffic Operations Analysis are appropriate to use as the updated 2018 opening year volumes." To confirm, the "Does Not Exist" condition would not occur until the project opened in 2018, and would only occur as referenced in this Table, if Alternative 6 were constructed. However, as discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction.

[2] This intersection is replaced by the new Commerce Way/Barton Road intersection. To confirm, as noted above, the "Does Not Exist" condition would not occur until the Project opened in 2018. As discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction. The Barton Road/Michigan Street intersection will be replaced by the new Commerce Way/Barton Road intersection when the Project opens in 2018.

[3] Delay for stop-controlled approach; v/c not applicable.

***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

Table 2.5.R shows the projected 2016 AM and PM peak-hour queue lengths for the I-215/Barton Road interchange northbound and southbound ramp intersections for Alternative 6. The queue lengths would not exceed the available storage and are adequate for both the northbound and the southbound I-215 ramps.

Table 2.5.R Alternative 6 2016 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
* Barton Road/I-215 SB Ramps: EB left-turn lane	250	85	250	183
* Commerce Way/I-215 NB Ramps: NB left-turn lane	410	87	410	64

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).
***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

The ramp merge/diverge areas are similar in each of the alternatives except for the Barton Road northbound off-ramp, which is different in the No Build condition, as a second lane would be added to the Barton Road northbound off-ramp in all the Build Alternatives. Therefore, the ramp LOS for 2016 under Alternative 6 would be the same as shown in Table 2.5.H for the No Build Alternative except that the Barton Road northbound off-ramp would operate at LOS B under Alternative 6 and the other Build Alternatives in both peak hours. All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS for 2016.

Analysis for 2040

Similar to Alternative 3, Alternative 6 would not add additional capacity to the freeway mainline beyond that added by the I-215 Bi-County HOV Lane Gap Closure Project and the I-215 Bi-County Improvement Project. Therefore again, as a result, the freeway LOS for 2040 under Alternative 6 would be the same as shown in Table 2.5.I for the No Build Alternative. All freeway segments in both the AM and PM peak hours are projected to operate at satisfactory LOS for 2040 with the exception of northbound I-215 between the Barton Road off-ramp and the Barton Road on-ramp in the PM peak hour.

Table 2.5.S summarizes the projected 2040 Alternative 6 AM and PM peak-hour LOS for the study area intersections. All intersections in the study area are projected to operate at LOS D or better for 2040 under Alternative 6, with the exception of Barton Road/La Cadena Drive, which would operate at unsatisfactory LOS in the PM peak hour. This deficiency is not a result of the Project however, as this intersection

Table 2.5.S Alternative 6 2040 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
1. Barton Road/La Cadena Drive	D	39.0	0.96	F	165.7	1.49
2. Barton Road/Grand Terrace Road	A	7.5	0.61	A	6.3	0.58
3. Barton Road/La Crosse Avenue	Does not Exist[1]					
4. Barton Road/I-215 SB Ramps	C	20.3	0.68	B	16.3	0.63
5. Barton Road/I-215 NB Ramps	C	23.3	0.90	B	19.1	0.83
6. Barton Road/Michigan Street	Does not Exist[2]					
7. Barton Road/Vivienda Avenue	D	50.7	0.93	D	50.0	0.95

Source: *Interstate 215 Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).

[1] The southern segment of La Crosse Avenue would be removed by the I-215 Bi-County Improvement Project.

[2] This intersection is replaced by the new Commerce Way/Barton Road intersection.

operates at unsatisfactory LOS in the PM peak hour for 2040 in the No Build Condition. Alternative 6 would reduce the delay at that intersection slightly, when compared to the No Build Alternative. To achieve a satisfactory LOS at this intersection located in the City of Colton, La Cadena Drive would need to be widened to six lanes. The City would need to conduct widening of La Cadena Drive as a separate project.

Table 2.5.T shows the projected 2040 AM and PM peak-hour queue lengths for the I-215/Barton Road interchange northbound and southbound ramp intersections for Alternative 6. The queue lengths would not exceed the available storage for both the northbound and the southbound I-215 ramps.

Table 2.5.T Alternative 6 2040 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
Barton Road/I-215 SB Ramps: EB left-turn lane	250	130	250	191
Commerce Way/I-215 NB Ramps: NB left-turn lane	410	390	410	198

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).

The ramp merge/diverge areas are similar in each of the alternatives, and the ramp LOS for 2040 under Alternative 6 would be the same as shown earlier in Table 2.5.L for the No Build Alternative. All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS for 2040.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Analysis for 2016

Similar to Build Alternatives 3 and 6, Modified Alternative 7 would not add additional capacity to the freeway mainline beyond that added by the I-215 Bi-County HOV Lane Gap Closure Project. Therefore, the freeway LOS for 2016 under Modified Alternative 7 would be the same as shown earlier in Table 2.5.E for the No Build Alternative. All freeway segments in the study area are projected to operate at satisfactory LOS during the AM and PM peak hours for 2016.

Table 2.5.U summarizes the projected 2016 AM and PM peak-hour LOS for Modified Alternative 7 for the study area intersections. All intersections in the study area are projected to operate at satisfactory LOS during the AM and PM peak hours.

Table 2.5.U Modified Alternative 7 (Preferred Alternative)
2016 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
*Barton Road/La Cadena Drive	B	13.2	0.51	C	24.4	0.85
*Barton Road/Grand Terrace Road	A	9.9	0.43	A	2.7	0.53
*Barton Road/I-215 SB Ramps/La Crosse Avenue	A	2.8	-	A	3.1	-
*Barton Road/I-215 NB Ramps	B	10.5	0.40	B	12.4	0.42
*Barton Road/Michigan Street	Does Not Exist[1]					
*Barton Road/Vivienda Avenue	B	20.2	0.50	B	13.7	0.47

Sources: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011); *Barton Road Interchange Improvement Project Roundabout Analyses* (August 2013).

[1] This intersection is replaced by the new Commerce Way/Barton Road intersection. As noted in the discussion included in Section 2.5.3.2 of this Environmental Document, a *Traffic Volume Comparison Memorandum* (November 2013), prepared to address whether previously approved 2016 traffic volumes (in conjunction with when 2016 was the planned Opening Year for the Project) are appropriate for use as the basis for traffic analysis for the Project's revised planned opening year changing to 2018, concluded, "…opening" year 2016 volumes in the Traffic Operations Analysis are appropriate to use as the updated 2018 opening year volumes." To confirm, the "Does Not Exist" condition would not occur until the project opened in 2018. As discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction. The Barton Road/Michigan Street intersection will be replaced by the new Commerce Way/Barton Road intersection when the Project opens in 2018.

* See note included at bottom of Table 2.5.E above, on page 2.5-11.

Table 2.5.V shows the projected 2016 AM and PM peak-hour queue lengths for the I-215/Barton Road interchange northbound on-ramp intersection for Modified Alternative 7. The queue lengths would not exceed the available storage for the I-215 northbound on-ramp. No left-turn lanes would be provided at the I-215 southbound ramps because there would be a roundabout constructed at this location.

Table 2.5.V Modified Alternative 7 (Preferred Alternative) 2016 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
*Barton Road/I-215 NB Ramps: EB left-turn lanes	435	114	435	141

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).
***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

The ramp merge/diverge areas are similar in each of the alternatives, except for the Barton Road northbound off-ramp, which is different in the No Build condition, as a second lane would be added to the Barton Road northbound off-ramp in all the Build Alternatives. Accordingly, the ramp LOS for 2016 under Modified Alternative 7 would be the same as shown in Table 2.5.H for the No Build Alternative except that the Barton Road northbound off-ramp would operate at LOS B under Modified Alternative 7 and the other Build Alternatives in both peak hours. All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS.

Analysis for 2040

Similar to Alternatives 3 and 6, Modified Alternative 7 would not add additional capacity to the freeway mainline beyond that added by the I-215 Bi-County HOV Lane Gap Closure Project and the I-215 Bi-County Improvement Project. Therefore, the freeway LOS for 2040 under Modified Alternative 7 would be the same as shown earlier in Table 2.5.I for the No Build Alternative. All freeway segments in both the AM and PM peak hours are projected to operate at satisfactory LOS with the exception of northbound I-215 between the Barton Road off-ramp and the Barton Road on-ramp in the PM peak hour.

Table 2.5.W summarizes the projected 2040 Modified Alternative 7 AM and PM peak-hour LOS for the study area intersections. All intersections in the study area are projected to operate at satisfactory LOS with the exception of Barton Road/La Cadena Drive, which would operate at unsatisfactory LOS F in the PM peak hour.

Table 2.5.W Modified Alternative 7 (Preferred Alternative) 2040 Intersection LOS

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Seconds)	V/C	LOS	Delay (Seconds)	V/C
Barton Road/La Cadena Drive	D	42.3	0.97	F	168.9	1.49
Barton Road/Grand Terrace Road	B	10.2	0.62	A	5.4	0.58
Barton Road/La Crosse Avenue	Does Not Exist[1]					
Barton Road/I-215 SB Ramps/La Crosse Avenue[2]	A	4.8	-	A	8.6	-
Barton Road/I-215 NB Ramps	B	14.0	0.70	C	30.5	0.95
Barton Road/Michigan Street	Does Not Exist[2]					
Barton Road/Vivienda Avenue	D	51.8	0.90	D	45.2	0.97

Sources: *Interstate 215 Barton Road Interchange Improvement Revised Traffic Operations Analysis* (December 2011); *Barton Road Interchange Improvement Project: Roundabout Analyses* (August 2013).

[1] The southern segment of La Crosse Avenue would be removed by the I-215 Bi-County Improvement Project.

[2] This intersection is replaced by the new Commerce Way/Barton Road intersection.

This deficiency is not a result of the Modified Alternative 7 however, as this intersection operates at unsatisfactory LOS in the PM peak hour for 2040 in the No Build Condition. Modified Alternative 7 would reduce the delay at that intersection slightly when compared to the No Build Alternative. To achieve a satisfactory LOS at this intersection located in the City of Colton, La Cadena Drive would need to be widened to six lanes. The City would need to conduct widening of La Cadena Drive as a separate project.

Table 2.5.X shows the projected 2040 AM and PM peak-hour queue lengths for the I-215/Barton Road interchange northbound on-ramp intersection for Modified Alternative 7. The queue lengths would not exceed the available storage for the I-215 northbound on-ramp. No left-turn lane would be provided at the I-215 southbound on-ramp since there would be a roundabout constructed at this location.

Table 2.5.X Modified Alternative 7 (Preferred Alternative) 2040 Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (ft)	Queue Length 95th Percentile (ft)	Space Provided (ft)	Queue Length 95th Percentile (ft)
Barton Road/I-215 NB Ramps: EB left-turn lanes	435	211	435	296

Source: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011).

The ramp merge/diverge areas are similar in each of the Build Alternatives, and the ramp LOS for 2040 under Modified Alternative 7 would be the same as those shown in Table 2.5.L for the No Build Alternative. All freeway ramp junctions in both the AM and PM peak hours are projected to operate at satisfactory LOS for 2040.

Summary

Analysis for 2016

The Build Alternatives would provide adequate queuing distance at the westbound left-turn lane at the I-215/Barton Road interchange southbound ramps when comparing 2016 to the Existing Condition.

Table 2.5.Y provides a comparison of the projected LOS under the No Build Alternative and the projected LOS under the Build Alternatives for 2016, for the mainline segments, intersections, and ramps. Under all alternatives, all freeway segments are projected to operate at satisfactory LOS during the AM and PM peak hours.

For Alternatives 3 and Modified Alternative 7, the segment between the ramps at the I-215/Iowa Avenue interchange and the ramps at the I-215/Barton Road interchange is not a weaving segment since the length of the segment is greater than the standard 2,500 ft in the northbound and southbound directions. A northbound weaving analysis was conducted for Alternative 6 because the distance between the I-215/Iowa Avenue interchange on-ramp and the I-215/Barton Road interchange off-ramp in the northbound direction would be approximately 1,490 ft (less than 2,500 ft). The weaving analysis results showed that this northbound freeway weaving segment is projected to operate at satisfactory LOS in the AM and PM peak hours. The same freeway segment in the southbound direction is not a weaving segment because the distance is greater than 2,500 ft.

Table 2.5.Y shows that for 2016, under the No Build Alternative, Barton Road/Grand Terrace Road is projected to operate at unsatisfactory LOS in the AM and PM peak hours. All study area intersections are projected to operate at satisfactory LOS under the Build Alternatives.

Under the No Build Alternative, for 2016 the westbound left-turn lane at I-215/Barton Road interchange southbound ramps would have inadequate queuing distance during both the AM and PM peak hours. Under the Build Alternatives, the eastbound and westbound left-turn lanes onto the I-215 ramps have adequate queuing distance during both the AM and PM peak hours.

Table 2.5.Y 2016 LOS Comparison by Alternative

Intersection	No Build Alternative LOS		Build Alternatives LOS					
			Alternative 3		Alternative 6		Modified Alternative 7 (Preferred Alternative)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS
I-215 Mainline Segment LOS NB								
* Iowa Avenue On-Ramp to Barton Road Off-Ramp	D	E	C	D	C	D	C	D
* Barton Road Off-Ramp to Barton Road On-Ramp	D	D	D	D	D	D	D	D
* Barton Road On-Ramp to Washington Street Off-Ramp	D	E	D	E	D	E	D	E
I-215 Mainline Segment LOS SB								
* Washington On-Ramp to Barton Road Off-Ramp	E	D	E	D	E	D	E	D
* Barton Road Off-Ramp to Barton Road On-Ramp	D	D	D	D	D	D	D	D
* Barton Road On-Ramp to La Cadena Drive Off-Ramp	E	D	E	D	E	D	E	D
Intersection LOS								
* Barton Road/La Cadena Drive	B	C	B	C	B	C	B	C
* Barton Road/Grand Terrace Road	F	F	A	A	A	A	A	A
* Barton Road/La Crosse Avenue[1]	B	C	N/A	N/A	N/A	N/A	N/A	N/A
* Barton Road/I-215 Southbound Ramps[2]	C	E	A	A	B	C	A	A
* Barton Road/I-215 Northbound Ramps	B	B	A	A	N/A	B	B	B
* Barton Road/Michigan Street[3]	B	B	N/A	N/A	N/A	N/A	N/A	N/A
* Barton Road/Vivienda Avenue	C	C	B	B	B	B	B	B
* Barton Road/Terrace Avenue	C	C	N/A	N/A	C	C	C	C
Ramp LOS NB								
* Iowa Avenue Off-Ramp	D	D	D	D	D	D	D	D
* Iowa Avenue On-Ramp	D	E	D	E	D	E	D	E
* Barton Road Off-Ramp	D	E	B	B	B	B	B	B
* Barton Road On-Ramp	D	D	D	D	D	D	D	D
* Mt. Vernon Avenue (Washington Street) Off-Ramp	D	E	D	E	D	E	D	E
* Mt. Vernon Avenue (Washington Street) On-Ramp	D	D	D	D	D	D	D	D

Table 2.5.Y 2016 LOS Comparison by Alternative (Continued)

Intersection	No Build Alternative LOS		Build Alternatives LOS					
			Alternative 3		Alternative 6		Modified Alternative 7 (Preferred Alternaitve)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS	AM Peak Hour LOS	PM Peak Hour LOS
Ramp LOS SB								
* Washington Street Off-Ramp	E	E	E	E	E	E	E	E
* Washington Street On-Ramp	D	D	D	D	D	D	D	D
* Barton Road Off-Ramp	E	D	E	D	E	D	E	D
* Barton Road On-Ramp	D	D	D	D	D	D	D	D
* La Cadena Drive Off-Ramp	E	D	E	D	E	D	E	D
* La Cadena Drive On-Ramp	D	D	D	D	D	D	D	D

Sources: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011); *Barton Road Interchange Improvement Project: Roundabout Analyses* (August 2013); *Draft Project Report* (November 2013).

[1] This intersection would be modified such that only the southern segment of La Crosse Avenue would remain. As noted in the discussion included in Section 2.5.3.2 of this Environmental Document, a *Traffic Volume Comparison Memorandum* (November 2013), prepared to address whether previously approved 2016 traffic volumes (in conjunction with when 2016 was the planned Opening Year for the Project) are appropriate for use as the basis for traffic analysis for the Project's revised planned opening year changing to 2018, concluded, "…opening" year 2016 volumes in the Traffic Operations Analysis are appropriate to use as the updated 2018 opening year volumes." To confirm, the referenced "N/A" would not occur until the project opened in 2018, and would only occur as referenced in this Table, if Alternative 3 or Alternative 6 were constructed. However, as discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction.

[2] Modified Alternative 7 includes a roundabout at the Barton Road/I-215 SB Ramps/La Crosse Avenue intersection.

[3] This intersection is replaced by the new Commerce Way/Barton Road intersection. To confirm, the referenced "N/A" would not occur until the Project opened in 2018. As discussed in Section 1.6 of this Environmental Document, Modified Alternative 7 has been identified as the Project Preferred Alternative, and accordingly, will be the basis for the Project's Design and Construction. The Barton Road/Michigan Street intersection will be replaced by the new Commerce Way/Barton Road intersection when the Project opens in 2018.

~~[1] Modified Alternative 7 includes a roundabout at the Barton Road/I-215 SB Ramps/La Crosse Avenue intersection.~~

Note: N/A = Not Applicable. Intersection does not exist under this Build Alternative, or was not analyzed.

***** See note included at bottom of Table 2.5.E above, on page 2.5-11.

Under all alternatives, for 2016 all freeway ramp junctions are projected to operate at satisfactory LOS during the AM and PM peak hours. A second lane would be added to the Barton Road northbound off-ramp under all the Build Alternatives, which would improve LOS at this location.

When compared to the No Build Alternative, the Build Alternatives would provide satisfactory LOS at the study area intersections and would provide adequate queueing distance at the westbound left-turn lane at I-215/Barton Road interchange southbound ramps. The Build Alternatives would improve traffic circulation at the interchange.

Analysis for 2040

The Build Alternatives would provide adequate queuing distance at the westbound left-turn lane at the I-215/Barton Road interchange southbound ramps when comparing 2040 to the Existing Condition.

Table 2.5.Z provides a comparison of the projected LOS under the No Build and the projected LOS under the Build Alternatives for the 2040 mainline segments, intersections, and ramp junctions. Under all alternatives, all freeway segments are projected to operate at satisfactory LOS during both the AM and PM peak hours, with the exception of the northbound I-215 between the Barton Road off-ramp and the Barton Road on-ramp, which would operate at unsatisfactory LOS in the PM peak hour during the peak 15-minute period. This is a function of the I-215 mainline being at overcapacity. Under all alternatives, for 2040 all freeway ramp junctions are projected to operate at satisfactory LOS during the AM and PM peak hours. LOS improves in 2040 due to construction of the future I-215 Bi-County Improvement Project.

All study area intersections for 2040 are projected to operate at unsatisfactory LOS under the No Build Alternative, with one exception: Barton Road/La Cadena Drive is projected to operate at satisfactory LOS during the AM peak hour. Under the Build Alternatives, all study area intersections are projected to operate at satisfactory LOS with one exception: Barton Road/La Cadena Drive is projected to operate at unsatisfactory LOS in the PM peak hour. This deficiency is not a result of the Build Alternatives however, as this intersection operates at unsatisfactory LOS in the PM peak hour for 2040 in the No Build Condition. In fact, each Build Alternative would reduce the delay slightly. In order to achieve a satisfactory LOS for 2040 at Barton Road/La Cadena Drive, which is located in the City of Colton, La Cadena Drive

Table 2.5.Z 2040 LOS Comparison by Alternative

Intersection	No Build Alternative LOS		Build Alternatives LOS					
			Alternative 3		Alternative 6		Modified Alternative 7 (Preferred Alternaitve)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
I-215 Mainline Segment LOS NB								
Iowa Avenue On-Ramp to Barton Road Off-Ramp	D	E	D	E	D	E	D	E
Barton Road Off-Ramp to Barton Road On-Ramp	E	F	E	F	E	F	E	F
Barton Road On-Ramp to Washington Street Off-Ramp	D	E	D	E	D	E	D	E
I-215 Mainline Segment LOS SB								
Washington On-Ramp to Barton Road Off-Ramp	D	D	D	D	D	D	D	D
Barton Road Off-Ramp to Barton Road On-Ramp	E	E	E	E	E	E	E	E
Barton Road On-Ramp to La Cadena Drive Off-Ramp	D	D	D	D	D	D	D	D
Intersection LOS								
Barton Road/La Cadena Drive	C	F	D	F	D	F	D	F
Barton Road/Grand Terrace Road	F	F	A	A	A	A	B	A
Barton Road/La Crosse Avenue	F	F	N/A	N/A	N/A	N/A	N/A	N/A
Barton Road/I-215 SB Ramps[1]	F	F	B	B	C	B	A	A
Barton Road/I-215 NB Ramps	F	F	A	B	C	B	B	C
Barton Road/Michigan Street	F	F	N/A	N/A	N/A	N/A	N/A	N/A
Barton Road/Vivienda Avenue	F	F	D	D	D	D	D	D
Ramp LOS NB								
Iowa Avenue Off-Ramp	A	A	A	A	A	A	A	A
Iowa Avenue On-Ramp	C	D	C	D	C	D	C	D
Barton Road Off-Ramp	A	A	A	A	A	A	A	A
Barton Road On-Ramp	C	B	C	B	C	B	C	B
Washington Street Off-Ramp	B	B	B	B	B	B	B	B
Washington Street On-Ramp	D	C	D	C	D	C	D	C

Table 2.5.Z 2040 LOS Comparison by Alternative (Continued)

Intersection	No Build Alternative LOS		Build Alternatives LOS					
			Alternative 3		Alternative 6		Modified Alternative 7 (Preferred Alternative)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Ramp LOS SB								
Washington Street Off-Ramp	B	B	B	B	B	B	B	B
Washington Street On-Ramp	B	C	B	C	B	C	B	C
Barton Road Off-Ramp	A	A	A	A	A	A	A	A
Barton Road On-Ramp	C	B	C	B	C	B	C	B
La Cadena Drive Off-Ramp	B	B	B	B	B	B	B	B
La Cadena Drive On-Ramp	C	B	C	B	C	B	C	B

Sources: *Interstate 215/Barton Road Interchange Improvement Project Revised Traffic Operations Analysis* (December 2011); *Barton Road Interchange Improvement Project Roundabout Analyses* (August 2013); *Draft Project Report* (November 2013)

[1] Modified Alternative 7 includes a roundabout at the Barton Road/I-215 SB Ramps/La Crosse Avenue intersection.

Note: N/A = not applicable. Intersection does not exist under this Build Alternative.

would need to be widened to six lanes. This would need to be conducted as a separate project by the City of Colton.

When compared to the No Build Alternative, the Build Alternatives would provide satisfactory LOS at all the study area intersections but one (which would fail under the No Build Alternative as well) and would provide adequate queueing distance at the westbound left-turn lane at I-215/Barton Road interchange southbound ramps. Based on the results of analysis performed, the Build Alternatives would improve traffic circulation at the interchange through 2040, the design horizon year.

Pedestrian Access

The No Build Alternative does not include any changes to pedestrian access within the Project limits. Sidewalks are provided along the north side of Barton Road, ending approximately 225 ft west of the southbound ramps within the Project area. In order to safely traverse the entire east-west length of the Project area along Barton Road, pedestrians currently must follow the existing sidewalks along the north side of Barton Road, crossing two unsignalized "T" intersections (Barton Road/Vivienda Avenue and Barton Road/Grand Terrace Road), which lack crosswalk facilities. Pedestrians are further required to cross the two entrances to the Barton Road on-ramp for northbound I-215 on-ramp (the eastbound on-ramp entrance is signalized, while the westbound on-ramp is not), and the two exit lanes from the Barton Road off-ramp for southbound I-215 (the exit lane for eastbound traffic is signalized, while the westbound exit lane remains unsignalized). There are no sidewalks on La Crosse Avenue, Grand Terrace Road, or Vivienda Avenue within the Project area. Michigan Street and La Cadena Drive have sidewalks in some areas, but they are not continuous through the Project area. Therefore, Alternative 1 would not improve pedestrian access in the Project area.

Within the Project limits, existing nonstandard curb ramps would be upgraded to conform to ADA requirements. New curb ramps would meet ADA requirements. In addition, minimum 5 ft wide sidewalks have been incorporated into the design in order to provide ADA-required access. Alternatives 3, 6, and Modified Alternative 7 would provide standard sidewalks on both sides of Barton Road, which currently has sidewalks on only the north side of the street from the eastern edge of the Project site to a point approximately 225 ft west of the I-215 southbound ramps. Alternative 3 would include four signalized intersections with crosswalk facilities along Barton Road to eliminate the need for pedestrians to cross unsignalized traffic movements, which would improve pedestrian safety and access by reducing pedestrian-vehicular

conflicts. Alternative 6 and Modified Alternative 7 would also eliminate unsignalized pedestrian crossings along Barton Road; however, it would do so by consolidating the number of signalized intersections along Barton Road to three, which would result in additional pedestrian safety access and safety improvements when compared to Alternative 3. These features would improve pedestrian access in the Project area; therefore, no impacts would occur.

Bicycle Facilities

The No Build Alternative does not include any changes to bicycle facilities within the Project limits. An existing Class II bicycle lane is located on the eastbound side of Barton Road, east of Michigan Street. The City of Grand Terrace General Plan shows a planned bicycle lane on Barton Road from west of Michigan Street to the western city limit; however, this work is not currently on the list of the City's planned projects. Therefore, Alternative 1 would not improve bicycle access within the Project area.

Alternatives 3, 6, and Modified Alternative 7 would provide a standard Class II (on-road striped) bicycle lane on both sides of Barton Road, which would tie into the existing Class II bicycle lane located on the eastbound side of Barton Road, east of Michigan Street. These features would improve access for bicyclists in the Project area; therefore, no impacts would occur.

2.5.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of Measure TR-1 would minimize potential traffic impacts to motorists, bicyclists, and pedestrians traveling through the Project area during Project construction.

TR-1 **Transportation Management Plan.** A detailed Transportation Management Plan (TMP) will be prepared during the final design phase of the Project. The objective of the TMP is to minimize the potential impacts that construction activities may have on the traveling public and emergency services providers. Preparation of the TMP will be coordinated with the emergency services providers in the Project vicinity to minimize response delays resulting from traffic delays, temporary ramp and lane closures, and detours during Project construction.

The TMP for the Project will include the following elements and strategies:

a. During construction, the contractor will be required to coordinate all temporary ramp closures and detour plans with the Colton Joint Unified School District, as well as with applicable fire, emergency, medical, and law enforcement providers, to minimize temporary delays in school trips and provider response times.
b. The TMP will include construction staging, detours, and road closures, as applicable.
c. The Project will provide access to the parking area and gate for Grand Terrace Fitness Park at all times from Grand Terrace Road.
d. Traffic control plans and related specifications, to be completed during final design of the Project, will be developed in accordance with the Work Area Traffic Control Handbook (also referred to as the WATCH manual), Section 5 of the California Department of Transportation (Caltrans) Traffic Manual, Caltrans Standard Plans, and applicable city requirements. These plans and specifications will include elements such as: advance roadside signs and portable changeable message signs (CMSs); traffic surveillance; lane/ shoulder closures; and temporary signing/striping on local streets, the Interstate 215 (I-215) ramps, and the I-215 mainline. Temporary overnight lane closures of I-215 are anticipated during construction. Lane closures along the mainline, which will be limited to nighttime and will maintain at least one lane in each direction, will be coordinated with Caltrans.
e. The Project will implement a Construction Zone Enhanced Enforcement Program (COZEEP) and use California Highway Patrol (CHP) officers to enforce lane closures and provide a visual deterrent to errant/speeding vehicles.
f. The Project will implement a Public Awareness Campaign (PAC). Although any lane closures will occur at night, there will still be a potential temporary impact to vehicles traveling through the construction zone. The purpose of this PAC is to keep the surrounding community abreast of the Project's progress and construction activities that could affect the public's travel plans, as well as to minimize delays or confusion to the motoring public during construction activities. Mailers/flyers and local newspaper advertising will be used to disseminate this information.

g. The Project will implement a Construction Freeway Service Patrol (CFSP) program. The CFSP will provide tow truck service to aid stranded motorists and remove disabled vehicles from the traveled way or shoulders.
h. The Project will implement the following construction strategies to minimize construction-related impacts:
    i. Perform major construction activities at off-peak hours, such as at night or during the weekends, when feasible and reasonable.
    ii. Finalize ramp closure charts during the final design phase. During final design, the lane and ramp closures will be presented to the Caltrans Lane Closures Review Committee (LCRC) for approval.
    iii. Coordinate construction with adjacent projects. Coordination is important to address possible temporary increases in traffic due to detours from adjacent projects. Construction of the adjacent projects is anticipated to be completed prior to construction of the Project.
    iv. All ramp reconstruction and local street widening will be constructed in stages to minimize disruption.
i. The Project will include provisions for maintaining pedestrian and bicycle access at all times during construction.
j. The Project will include contingency plans that specify the actions that will be taken in the event that something unexpected occurs with respect to construction activities or traffic operations. The contractor will review these plans and incorporate them into the contractor's contingency plan.

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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 section is based on the *Visual Impact Assessment* (VIA) (November 2013). The study area for visual resources includes the area of Project improvements, including potential sound barriers on private property lines, as well as an approximate 500-foot (ft) wide area around those improvements. The additional 500 ft added to the maximum footprint of disturbance boundary is included in the study area because permanent changes associated with each Build Alternative would result in visual resource impacts that are not limited to the Project area. Sensitive viewers within 500 ft of the Project site are most likely to experience the greatest sensitivity to changes in visual resources as a result of the Project. Therefore, a 500 ft wide area is sufficient to determine how a viewshed would be impacted by the Project.

2.6.2.1 Visual Setting

The study area is located primarily in the City of Grand Terrace, with a small portion south of Barton Road and west of Interstate 215 (I-215) in the City of Colton. The City of Grand Terrace is located in the flatlands of the San Bernardino Valley and extends onto the slopes of Blue Mountain to the east and the La Loma Hills to the west. The City of Grand Terrace's terrain is diverse, ranging in elevation from a low of 920 ft above sea level (asl) to a high of 2,428 ft asl (Blue Mountain). Blue Mountain is the City of Grand Terrace's dominant landform and, as such, is also the

dominant component of a scenic vista available to a large number of observers at downslope locations to its west and northwest.

The community's western edge is bisected by I-215, which travels through the valley in a north-south direction. Two major rail corridors (BNSF Railway and Union Pacific Railroad [UPRR]) cross the western edge of the City of Grand Terrace. Although some large areas of open agricultural lands and hillside grasslands remain, much of the City of Grand Terrace and eastern Colton has been built out with a low-density pattern of urbanization. In the corridor along the freeway and railroad lines in the western side of the City of Grand Terrace, industrial and warehouse uses predominate. Large warehouse buildings and large paved areas associated with the industrial uses are a prominent part of the visual environment in this area. The portions of the City of Grand Terrace to the west and east of this corridor are characterized by neighborhoods of primarily single-family homes from which there are scenic views of nearby hills and the valley to the north of the City of Grand Terrace, as well as more distant mountain ridges.

2.6.2.2 Landscape Unit

A landscape unit is a portion of the regional landscape and can be thought of as an outdoor room that exhibits a distinct visual character. A landscape unit will often correspond to a place or district that is commonly known among local viewers. Blue Mountain is the primary landscape unit in the Project vicinity.

There are no historic districts or landscapes within the study area and no State or locally designated landmarks. In addition, neither I-215 nor Barton Road is designated a scenic highway.

2.6.2.3 Viewshed

A viewshed is a subset of a landscape unit and comprises all the surface areas visible from an observer's view point. The limits of a viewshed are defined as the visual limits of the views located from the Project. The viewshed also includes the locations of viewers likely to be affected by visual changes brought about by Project features.

The viewshed for this Project is the landscape that is visible from I-215 within the Project limits. At the southwestern end of the Project limits, the viewshed of the surrounding area is limited because there are large berms on both sides of the freeway that shield views of the surrounding area. The most dominant view from I-215 is facing north toward the San Bernardino Mountains. However, the views may be limited due to climate conditions (i.e., smog) and freeway signs.

Heading north through the Project limits, the berms on both sides of the freeway taper off, and views of Blue Mountain to the east and the La Loma Hills to the west become visible. However, these views are intermittently obstructed by landscape features and/or the commercial and residential properties located adjacent to I-215.

There are several existing retaining and sound barriers within the Project area. The existing sound barriers are primarily located adjacent to sensitive receivers (residences). The existing walls vary in size from 5 ft to 12.6 ft high.

2.6.2.4 Visual Character

Visual character definitions establish an existing condition that can be discussed in general terms and then compared to the postproject development visual character categories, with any differences identified. The study area is dominated by the I-215/ Barton Road interchange, including the freeway mainline travel lanes, embankments, I-215 ramps, and adjacent development and roads. Landscaping in the study area is typical of freeway corridors and includes grasses, low-lying shrubs, and a few trees. The I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project is currently under construction and all trees within State right of way in the interchange area have now been removed. The areas surrounding the I-215/Barton Road interchange are characterized by moderate-density development and infrastructure and open space/vacant land. Land uses within and surrounding the Project site are predominantly commercial, industrial, residential, and educational (Grand Terrace Elementary School).

2.6.2.5 Visual Quality

The visual quality of an area is evaluated by identifying the vividness, intactness, and unity present in the study area viewsheds. These identifying characteristics can be defined as follows:

- Vividness is the visual power or memorability of landscape components as they combine in distinctive visual patterns.
- Intactness is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as in natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the landscape.

Features considered encroachment elements in the assessment of the study area's intactness include human-built structures such as features of I-215 (e.g., freeway signs, sound barriers, overcrossings, utility lines and poles, yellow crash barrels, and k-rails) that encroach into the views within the Project viewshed. Encroaching features are dominant features that are easily noticeable and juxtaposed against natural elements (e.g., mature trees). Features contributing to the unity of the landscape include the general commercial, residential, and educational uses surrounding the study area. Development of commercial, residential, and educational uses are subject to the City's design review process and must adhere to zoning code design standards established to maintain unity in development. However, these land uses vary in design character depending on the period of development and degree of upkeep. Sound barriers can occasionally provide unity, particularly if they are textured or include a themed aesthetic treatment.

2.6.2.6 Sensitive Viewer Groups

The primary sensitive viewer groups in the study area include motorists traveling along I-215, Barton Road, Vivienda Avenue, Commerce Way, La Crosse Avenue, Grand Terrace Road, and Michigan Avenue. Other viewers likely to be affected by visual changes brought about by Project features include those from Grand Terrace Elementary School, residential properties adjacent to I-215 and surrounding areas, and commercial businesses within the Project limits.

2.6.2.7 Viewer Sensitivity

Viewer sensitivity is defined both as the viewers' concern for scenic quality and the viewers' response to change in the visual resources that make up the view. Local values and goals may confer visual significance on landscape components and areas that would otherwise appear unexceptional in a visual resources analysis. Even when the existing appearance of a project site is uninspiring, a community may still object to projects that fall short of its visual goals.

A viewer traveling along I-215 and/or Barton Road has intermittent views of scenic elements such as Blue Mountain and the La Loma Hills; however, each of these scenic elements is obstructed by the existing development and vegetation located within the study area. Therefore, views from I-215 and Barton Road are not panoramic views, and the sensitivity of a viewer traveling along I-215 and/or Barton Road would not be considered high. Additionally, the study area is not defined as a scenic highway by State or local governments.

Viewers at public educational uses have a higher concern for scenic quality because public educational facilities include recreational uses (e.g., elementary school playgrounds). Viewers at residential land uses have a higher concern for scenic quality because they have an investment in the overall quality of their property and often spend the majority of their time at their place of residence. The sensitivity of viewers from educational and residential uses within the viewshed of the Project would be considered high because these land uses are places of relaxation, education, and recreation.

2.6.2.8 Viewer Exposure and Response

Viewer exposure is typically assessed by measuring the number of viewers exposed to the resource change, the type of viewer activity, the duration of the view, the speed at which the viewer moves, and the position of the viewer.

Viewer response is composed of two elements: viewer sensitivity and viewer exposure. These elements combine to form a method of predicting how the public might react to visual changes brought about by a project.

Motorists traveling along I-215 and/or Barton Road would be considered to have a low exposure to the visual changes because the change in view from the road would not be substantial and the duration of the view would be brief as the viewer travels through the study area. The residential and educational uses adjacent to the Project would be considered to have a medium to high viewer exposure because the viewers would be stationary and would generally have a longer level of exposure to the changes in views, and because activities at these uses are considered sensitive in nature.

2.6.2.9 Key Views

Because it is not feasible to analyze all the views in which the Project would be seen, it is necessary to select a number of key view points that would most clearly display the visual effects of the Project. Key views also represent the primary viewer groups that would potentially be affected by the Project.

To evaluate the visual effects created by the Project, specific views have been identified to represent the visual resources, the quality of typical existing viewsheds from the perspective of sensitive viewers in the study area, and the sensitive viewer's perspective. Nonsensitive viewers surround the majority of the study area (i.e., commercial, light industrial, and transportation uses). Key views were selected that most clearly display the visual effects of the Project from the perspective of a sensitive viewer with a higher exposure to the Project changes and that represent the

primary viewer groups potentially affected by the Project. The key views represent the visual quality of typical existing viewsheds in the study area that would be modified by the Project.

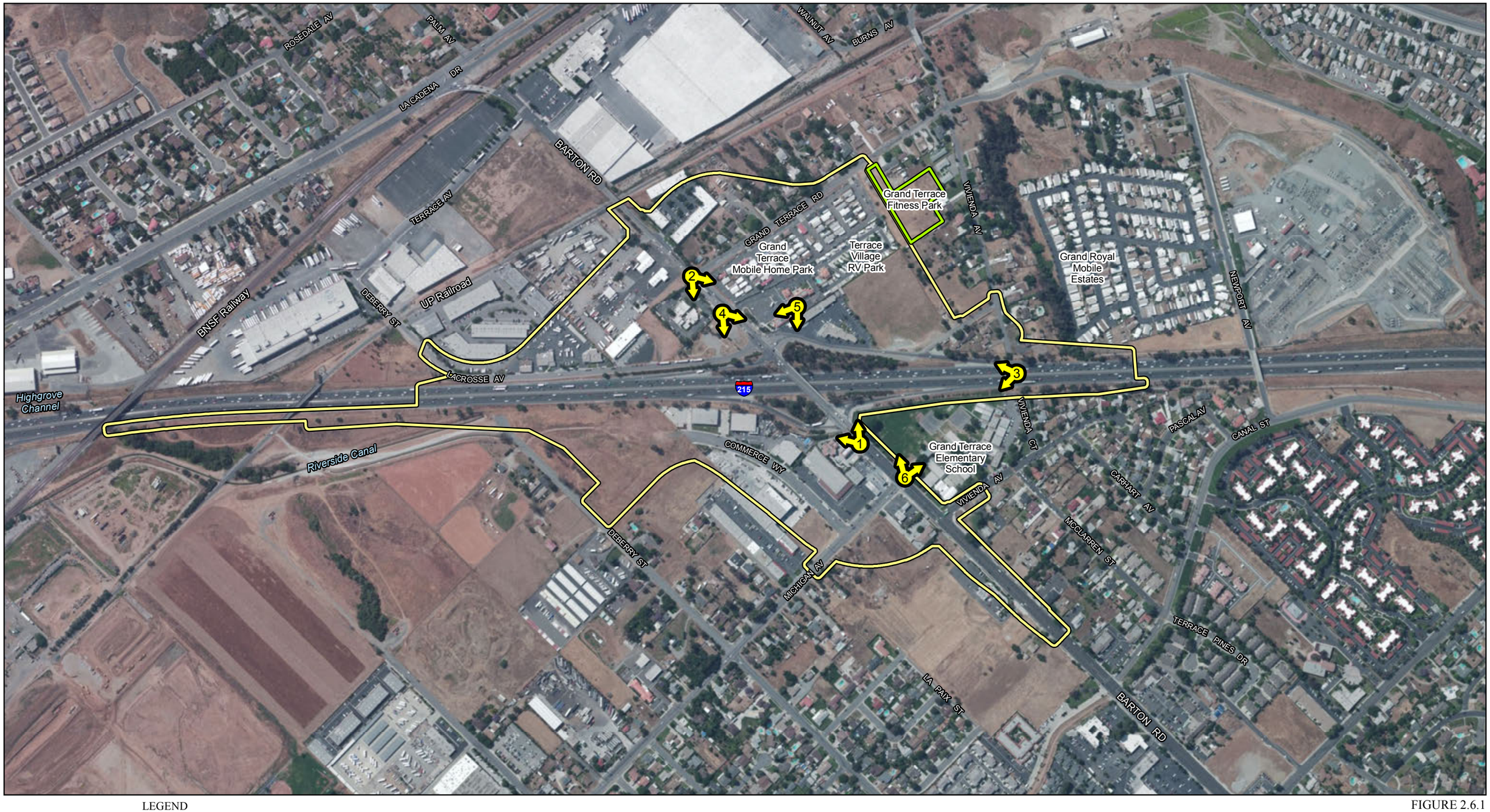
The location and direction for each of the key views are shown on an aerial photograph on Figure 2.6.1, and the existing key views and view simulations are shown later in Section 2.6.3, Environmental Consequences, on Figures 2.6.2 through 2.6.10. Descriptions of the existing key views are provided below along with a numerical evaluation of the existing visual quality.

Key View 1

Key View 1 (Figure 2.6.2 shown later in Section 2.6.3, Environmental Consequences) is an existing view from the view point of a motorist traveling west on Barton Road approximately 150 ft east of the Barton Road/I-215 overcrossing. The foreground of the view includes Barton Road and ornamental vegetation within a landscaped median. Middleground views include Barton Road, landscaped median, ornamental vegetation, the I-215 northbound on-ramp, trees, a brick wall, and roadway signage. Background views include Barton Road, the overcrossing, fencing, traffic signals, utility poles and lines, trees, the La Loma Hills, vehicles, and sky. There are no designated visual resources within the existing view of Key View 1. This view represents typical views from a motorist traveling on Barton Road in the vicinity of I-215.

The existing viewer sensitivity from Key View 1 would be considered low because of the obstructed views of scenic elements. In this location, views from the road and Grand Terrace Elementary School are of Barton Road, ornamental landscaping, and a narrow view of La Loma Hills. There are a high number of motorists traveling on Barton Road at the I-215 interchange; however, because of the viewer activity, duration, speed, and position of motorists, the existing viewer exposure would be considered medium from Key View 1.

The overall existing visual quality of Key View 1 is 3.3 (i.e., moderately low) due to the presence of Barton Road, the I-215 on-ramp, roadway signage, and associated vehicles, as listed in Table 2.6.A.



LEGEND

Study Area

Key View Location

0 250 500
FEET

SOURCE: Microsoft (5/2010)

I:\SBA330\Barton_I-215\GIS\ISEA\KeyViewIndex.mxd (10/17/2013)

FIGURE 2.6.1

I-215/Barton Road Interchange Improvement Project

Key View Index Map

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Table 2.6.A Key Views Existing Visual Quality

Key View	Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
	Features	Rating	Encroachment	Rating	Elements	Rating	([V+I+U]/3)
1	Moderate level of vividness with the presence of mature landscaping; however, lacking striking features.	4	Integrity of natural features impacted by the presence of road, on- and off-ramps, and overcrossing.	3	Roadway, traffic signals, and signs contribute to a lack of visual harmony.	3	3.3
2	Moderate level of vividness with roadway, landscaping, and sky features.	4	Road, utility lines, and residential uses contribute to the lack of integrity.	3	Relatively low elevation of buildings and lack of distinctive natural features result in low disruption to harmony.	3	3.3
3	Lack of striking features and roadway contribute to a moderately low level of vividness.	3	I-215 and vehicular traffic contribute to the lack of integrity.	3	Roadway and signage contribute to the lack of harmony.	3	3
4	Moderate level of vividness with roadway, landscaping, and sky features.	4	Roadway, utility lines, commercial uses, and construction activity contribute to the lack of integrity.	3	Relatively low elevation of buildings and lack of distinctive natural features result in low disruption to harmony.	3	3.3
5	Moderate level of vividness with roadway, mountain, and sky features.	4	Roadway, utility lines, traffic signals, and construction activity contribute to the lack of integrity.	3	Roadway, poles, construction activity disrupt harmony.	2	3.0
6	Playground and landscaping are vivid striking features.	5	Integrity negatively impacted by presence of I-215.	3	Unity negatively impacted by presence of I-215.	4	4

Source: VIA (November 2013).

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

Key View 2

Key View 2 (Figure 2.6.3 shown later in Section 2.6.3 Environmental Consequences) is an existing view from the view point of a motorist traveling east on Barton Road approximately 480 ft west of the Barton Road/I-215 overcrossing. The foreground of the view includes Barton Road. Middleground views include Barton Road, ornamental vegetation, utility poles and lines, a wrought iron fence, and mobile homes. Background views include Barton Road, vehicles, utility poles and lines,

mobile homes, trees, Blue Mountain hills, and sky. In this location, the Grand Terrace Mobile Home Park view includes Barton Road, commercial buildings on the road, and I-215 in the background. There are no designated visual resources within the existing view of Key View 2.

The existing viewer sensitivity from Key View 2 would be considered low because of the obstructed views of scenic elements. There are a high number of motorists traveling on Barton Road at the I-215 interchange; however, because of viewer activity, duration, speed, and position of motorists, the existing viewer exposure would be considered medium from Key View 2.

The overall existing visual quality of Key View 2 is 3.3 (i.e., moderately low) due to the presence of the Barton Road, utility poles and lines, the wrought iron fence, mobile homes, and vehicles, as listed in Table 2.6.A.

Key View 3

Key View 3 (Figure 2.6.4 shown later in Section 2.6.3 Environmental Consequences) is an existing view from the view point of a motorist traveling south on I-215 approximately 960 ft north of the Barton Road overcrossing. The foreground of the view includes I-215, and a cement center divider. Middleground views include I-215, vehicles, and a cement center divider. In this location, residences on Vivienda Avenue and Vivienda Court, west and east of I-215, respectively, have a view of I-215. Background views include the Barton Road overcrossing, trees, hills, and sky. While this view location provides views of the horizon, these views are obstructed by I-215 and associated vehicles. This view represents a typical view from a motorist traveling on I-215 in the vicinity of Barton Road.

The existing viewer sensitivity from Key View 3 would be considered medium because of the lack of scenic elements within this view. There are a high number of motorists traveling on I-215 at the Barton Road Interchange; however, because of the viewer activity, duration, speed, and position of motorists, the existing viewer exposure would be considered low from Key View 3.

The overall existing visual quality of Key View 3 is 3 (i.e., moderately low) due to the presence of I-215 and associated vehicles, as listed in Table 2.6.A.

Key View 4

Key View 4 (Figure 2.6.6 shown later in Section 2.6.3, Environmental Consequences) is an existing view from the view point of a motorist traveling east on Barton Road

approximately 200 ft west of the Barton Road/I-215 overcrossing. The foreground of the view includes Barton Road. Middleground views include Barton Road, ornamental vegetation, utility poles and lines, Demetri's Restaurant on the left side, and construction activity associated with the I-215 Bi-County HOV Lane Gap Closure Project on the right side. Background views include Barton Road, vehicles, utility poles and lines, trees, Blue Mountain hills, and sky. There are no designated visual resources within the existing view of Key View 4.

The existing viewer sensitivity from Key View 4 would be considered low because of the obstructed views of scenic elements. There are a high number of motorists traveling on Barton Road at the I-215 Interchange; however, because of the viewer activity, duration, speed, and position of motorists, the existing viewer exposure would be considered medium from Key View 4.

The overall existing visual quality of Key View 4 is 3.3 (i.e., moderately low), due to the presence of Barton Road, utility poles and lines, signs, and vehicles, as listed in Table 2.6.A.

Key View 5

Key View 5 (Figure 2.6.8 shown later in Section 2.6.3, Environmental Consequences) is an existing view from the view point of a motorist traveling south on the southbound off-ramp towards the roundabout. The foreground of the view includes the I-215 off-ramp at Barton Road. Middleground views include Barton Road, traffic signal poles, utility poles and lines, and construction activity associated with the I-215 Bi-County HOV Lane Gap Closure Project. Background views include an industrial building, trees, Blue Mountain hills, and sky. Blue Mountain is a designated visual resource within the existing view of Key View 5.

The existing viewer sensitivity from Key View 5 would be considered low because of the obstructed views of scenic elements. There are a high number of motorists traveling on Barton Road at the I-215 Interchange; however, because of the viewer activity, duration, speed, and position of motorists, the existing viewer exposure would be considered medium from Key View 5.

The overall existing visual quality of Key View 5 is 3.0 (i.e., moderately low), due to the presence of ramps, Barton Road, traffic signal poles, utility poles and lines, and vehicles as listed in Table 2.6.A.

Key View 6

Key View 6 (Figure 2.6.10 shown later in Section 2.6.3 Environmental Consequences) provides an existing view from the playground at Grand Terrace Elementary School in the City of Grand Terrace. Key View 6 faces northwest on Barton Road. Grass, trees, playground fencing, and equipment are located in the foreground. Middleground views include a playground ball field, playground equipment, fencing, grass, and trees. Background views include trees, fencing, I-215, vehicles, an obstructed view of the La Loma Hills, and sky. There are no designated visual resources within the existing view of Key View 6.

The existing viewer sensitivity from Key View 6 would be considered high because of the playground activity that takes place at Key View 6. There are a moderate number of viewers utilizing this playground (i.e., school children and instructors). The viewer activity is recreational, occurring over a period of time several times a day, and the stationary views and existing viewer exposure would be considered high from Key View 6.

The overall existing visual quality of Key View 6 is moderate (i.e., 4), due to the grass and trees, views of the La Loma Hills, and views of I-215, as shown in Table 2.6.A.

2.6.3 Environmental Consequences

2.6.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, the No Build Alternative would not result in temporary visual impacts.

Alternative 3 (Partial Cloverleaf Interchange)

Temporary visual impacts during construction, such as from construction activity, staging sites, truck hauling, excavation activity, and detour signage, are anticipated under Alternative 3. Alternative 3 would require temporary construction easements (TCEs) from private property owners for access and staging purposes. Impacts would be minimized through compliance with the California Department of Transportation (Caltrans) Standard Construction Specifications.

Alternative 6 (Modified Cloverleaf Interchange)

Temporary visual impacts of Alternative 6 would be the same as those discussed above for Alternative 3.

Modified Alternative 7 (Modified Cloverleaf/Diamond) (Preferred Alternative)

Temporary visual impacts of Modified Alternative 7 would be the same as those discussed above for Alternative 3.

2.6.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The I-215 Bi-County HOV Lane Gap Closure Project is currently under construction within the Project area, and trees have been removed within State right of way adjacent to the existing interchange ramps. As a result, the visual quality of the Project area is moderately low under Alternative 1.

Alternative 3 (Cloverleaf Interchange)

As discussed below, permanent impacts of Alternative 3 are analyzed from Key Views 1 and 2. Key View 6 is applicable for all Build Alternatives and is discussed at the end of this section.

Key View 1

As shown on Figure 2.6.2, the northbound on-ramp would be visible from Barton Road east of I-215. The proposed views would include Barton Road and ornamental vegetation in the foreground. The median and associated landscaping within the City limits would be removed to allow for the turn lane onto the I-215 northbound on-ramp and from the I-215 northbound off-ramp. Middleground views would include Barton Road, vehicles, a landscaped median, ornamental vegetation, a brick wall, and the I-215 Bi-County HOV Lane Gap Closure sound barrier along the I-215 northbound on-ramp. Some trees would be removed to accommodate the new I-215 northbound loop on-ramp. Background views would include Barton Road, the overcrossing, fencing, traffic signals, the La Loma Hills, vehicles, and sky. Some trees would be removed to accommodate the new I-215 southbound loop on-ramp. Changes to this viewscape represent the typical changes to views from Barton Road resulting from Alternative 3.

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Existing Key View 1 from Barton Road, east of I-215, facing west.

Key View 1 View Simulation of Alternative 3.

FIGURE 2.6.2

I-215/Barton Road Interchange Improvement Project

Key View 1

SOURCE: SoftMirage

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As shown in Table 2.6.B, the overall proposed visual quality of the proposed Key View 1 is moderately low (i.e., 3) due to removal of trees and ornamental landscaping and the widening of the Barton Road overcrossing. However, with the removal of trees, the La Loma Hills, located west of the Project area, would become partially visible from Barton Road. Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and measure VIS-2 includes aesthetic elements for hardscape such as sound barriers. Therefore, implementation of Alternative 3 would have a low-level visual impact on the visual quality of Key View 1.

Table 2.6.B Key View 1, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Moderate level of vividness with the presence of mature landscaping; however, lacking striking features.	4	Integrity of natural features impacted by the presence of road, on- and off-ramps, and overcrossing.	3	Roadway, traffic signals, and signs contribute to a lack of visual harmony.	3	3.3
Proposed View						
Improvements remove mature vegetation and reduce the distinctiveness of view.	3	Removal of mature landscaping provides views of natural features beyond.	3	Roadway and traffic signals would continue to contribute to a lack of harmony; however, removal of mature landscaping would provide views of hillsides beyond.	3	3
Difference from Existing Visual Quality						**-0.3**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

Because Alternative 3 would have a low-level visual impact on Key View 1, and because viewer sensitivity is low and viewer exposure is medium at Key View 1, it is anticipated that the viewer response would be considered low from the view point of a motorist at Key View 1. Therefore, visual impacts of Alternative 3 at Key View 1 would not be substantial.

Key View 2

As shown on Figure 2.6.3, the Alternative 3 southbound off-ramp would be visible from Barton Road west of I-215. The proposed views would include Barton Road and vehicles in the foreground. The grass turf on the south side of Barton Road

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Existing Key View 2 from Barton Road, west of I-215, facing east.

Key View 2 View Simulation of Alternative 3.

FIGURE 2.6.3

I-215/Barton Road Interchange Improvement Project
Key View 2

SOURCE: SoftMirage

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would be removed to accommodate the road widening. Middleground views include Barton Road, vehicles, ornamental vegetation/landscaping, utility poles and lines, and a sound barrier. Background views include Barton Road, overcrossing, fencing, traffic signals, the Barton Road southbound off-ramp, Blue Mountain, vehicles, and sky.

Changes to this viewscape represent the typical changes to views from Barton Road resulting from Alternative 3. Alternative 3 would require partial acquisition of the Grand Terrace Mobile Home Park located in the near left of the view and full acquisition of the commercial parcel located on the far left of the view to accommodate the southbound off-ramp and the Barton Road widening.

Additionally, Alternative 3 would require partial acquisition of the commercial parcel on the near right of Key View 2 and full acquisition of the commercial parcel on the far right of Key View 2 to accommodate the reconfigured intersection, Barton Road widening, and the southbound on-ramp and off-ramp. Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and Measure VIS-2 includes aesthetic elements for hardscape such as sound barriers.

As shown in Table 2.6.C, the overall proposed visual quality of Key View 2 is low (i.e., 2.6) due to the removal of trees and ornamental landscaping and the widening of Barton Road. Implementation of Alternative 3 would have a low-level visual impact on the visual quality of Key View 2.

Table 2.6.C Key View 2, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Moderate level of vividness with roadway, landscaping, and sky features.	4	Road, utility lines, and residential uses contribute to the lack of integrity.	3	Relatively low elevation of buildings and lack of distinctive natural features result in low disruption to harmony.	3	3.3
Proposed View						
Vividness decreases with the increase in humanmade features.	3	Additional encroachments are present with the proposed view.	2	Addition of the sound barrier provides coherence to the roadway view.	3	2.6
Difference from Existing Visual Quality						**-0.7**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

Because Alternative 3 would have a low-level visual impact on Key View 2, and because viewer sensitivity is low and viewer exposure is medium at Key View 2, it is anticipated that the viewer response would be considered low from the view point of a motorist at Key View 2. Therefore, visual impacts of Alternative 3 at Key View 2 would not be substantial.

Alternative 6 (Modified Cloverleaf Interchange)

Permanent impacts of Alternative 6 are analyzed from Key View 3. Key View 6 is applicable for all Build Alternatives and is discussed at the end of this section.

Key View 3

As shown on Figure 2.6.4, the Alternative 6 southbound on- and off-ramps and the widened Barton Road overcrossing would be visible from I-215 north of Barton Road. The proposed views would include I-215, vehicles, and a cement center divider in the foreground. Middleground views would include I-215, the I-215/Barton Road southbound off-ramp, vehicles, a cement center divider, and the I-215 Bi-County HOV Lane Gap Closure Project sound barrier as well as a potential sound barrier adjacent to the southbound off-ramp. In this location, residences on Vivienda Avenue and Vivienda Court would have a view of sound barriers that would separate the residential properties from I-215. Background views would include the Barton Road overcrossing, the I-215/Barton Road southbound on-ramp, hills, and sky. Alternative 6 would require partial acquisition of the residential parcel located on the near right, adjacent to the existing off-ramp, and full acquisition of the commercial parcel located on the far right, adjacent to the existing off-ramp, to accommodate the southbound on- and off-ramps. Changes to this viewscape represent the typical changes to views from I-215 resulting from Alternative 6.

As shown in Table 2.6.D, the overall visual quality of the proposed Key View 3 is low (i.e., 2), due to encroachment of the on- and off-ramps and removal of ornamental vegetation and trees. Implementation of Alternative 6 would have a low-level visual impact on Key View 3 due to the existing low visual quality. Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and Measure VIS-2 includes aesthetic elements for hardscape such as sound barriers.

Existing Key View 3 from I-215 south, north of Barton Road.

Key View 3 View Simulation of Alternative 6.

FIGURE 2.6.4

I-215/Barton Road Interchange Improvement Project

Key View 3

SOURCE: SoftMirage

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Table 2.6.D Key View 3, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Lack of striking features and roadway contribute to a moderately low level of vividness.	3	I-215 and vehicular traffic contribute to the lack of integrity.	3	Roadway and signage contribute to the lack of harmony.	3	3
Proposed View						
Removal of mature landscaping and addition of a sound barrier will reduce the level of vividness.	2	Additional roadway and sound barrier contributes to the lack of integrity and encroachments.	2	Additional roadway and sound barrier will reduce the harmony.	2	2
Difference from Existing Visual Quality						**-1**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

Because Alternative 6 would have a low-level visual impact on Key View 3, and because viewer sensitivity is medium and viewer exposure is low at Key View 3, it is anticipated that the viewer response would be considered low from the view point of a motorist at Key View 3.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Permanent impacts of Modified Alternative 7 are analyzed from Key View 1, 4, and 5. Key View 6 is applicable for all Build Alternatives and is discussed at the end of this section.

Key View 1

As shown on Figure 2.6.5, the Modified Alternative 7 northbound on-ramp would be visible from Barton Road east of I-215. The proposed views would include Barton Road, ornamental vegetation, and a landscaped median in the foreground.

Middleground views would include Barton Road, vehicles, a landscaped median, ornamental vegetation, a brick wall, and a sound barrier. The median would be reconstructed, requiring removal of the existing median landscaping. Trees would be removed to accommodate the new I-215 northbound on-ramp. Background views would include Barton Road, the Barton Road overcrossing, overcrossing fencing, traffic signals, the La Loma Hills, vehicles, and sky. Some trees would be removed to

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Existing Key View 1 from Barton Road, east of I-215, facing west.

Key View 1 View Simulation of Modified Alternative 7.

FIGURE 2.6.5

I-215/Barton Road Interchange Improvement Project

Key View 1

SOURCE: SoftMirage

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accommodate the new I-215 southbound loop on-ramp. As shown in Key View 1, the I-215 Bi-County HOV Lane Gap Closure Project will construct a sound barrier along the I-215 northbound on-ramp to reduce traffic noise at Grand Terrace Elementary School and residences adjacent to northbound I-215. Changes to this viewscape represent the typical changes to views from Barton Road resulting from Modified Alternative 7.

As shown in Table 2.6.E, the overall proposed visual quality of the proposed Key View 1 is moderately low (i.e., 3) due to removal of street trees and ornamental landscaping and the widening of the Barton Road overcrossing. However, with the removal of additional trees, the La Loma Hills would become partially visible from Barton Road. Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and Measure VIS-2 includes aesthetic elements for hardscape such as sound barriers. Therefore, implementation of Modified Alternative 7 would have a low-level visual impact on the visual quality of Key View 1.

Table 2.6.E Key View 1, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Same as Key View 1 for Alternative 3						
Proposed View						
Improvements remove mature vegetation and reduce the distinctiveness of view.	3	Removal of mature landscaping provides views of natural features beyond.	3	Roadway and traffic signals would continue to contribute to a lack of harmony; however, removal of mature landscaping would provide views of hillsides beyond.	3	3
Difference from Existing Visual Quality						**-0.3**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

Because Modified Alternative 7 would have a low-level visual impact on Key View 1, and because viewer sensitivity is low and viewer exposure is medium at Key View 1, it is anticipated that the viewer response would be considered low from the view point of a motorist at Key View 1. Therefore, visual impacts of Modified Alternative 7 at Key View 1 would not be substantial.

Key View 4

As shown on Figure 2.6.6, the planned roundabout would be visible from Barton Road west of I-215. The proposed views would include Barton Road and vehicles in the foreground. The grass turf on the south side of Barton Road would be removed to accommodate the road widening. Landscaping would be provided within and along the edges of the roundabout. Middleground views include Barton Road, vehicles, ornamental landscaping, and utility poles and lines. Background views include Barton Road, trees, and sky.

Changes to this viewscape represent the typical changes to views from Barton Road resulting from Modified Alternative 7, which would require full acquisition of the commercial parcel that contains Demetri's Restaurant to accommodate the planned southbound off-ramp, roundabout, and Barton Road widening.

The close-up view of Key View 4 (Figure 2.6.7) shows that the roadway features would be improved with the addition of a landscaped roundabout with an architectural feature and pedestrian crosswalk.

Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and Measure VIS-2 includes aesthetic elements for hardscape such as sound barriers. As shown in Table 2.6.F, the overall proposed visual quality of the proposed Key View 4 is low (i.e., 3.2) due to the removal of trees and ornamental landscaping and the widening of Barton Road. Implementation of Modified Alternative 7 would have a very low-level visual impact on the visual quality of Key View 4.

Because Modified Alternative 7 would have a low-level visual impact on Key View 4, and because viewer sensitivity is low and viewer exposure is medium at Key View 4, it is anticipated that the viewer response would be considered low from the view point of a motorist at Key View 4. Therefore, visual impacts of Modified Alternative 7 at Key View 4 would not be substantial.

Key View 5

As shown on Figure 2.6.8, the proposed views would include the I-215 southbound off-ramp and vehicles in the foreground. Middleground views include the roundabout, landscaping, and Barton Road. Background views include utility poles and lines, trees, Blue Mountain and sky.

Existing Key View 4 from Barton Road, west of I-215, facing east.

Key View 4 View Simulation of Modified Alternative 7.

FIGURE 2.6.6

I-215/Barton Road Interchange Improvement Project

Key View 4

SOURCE: Focus 360

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Key View 4 View Simulation of Modified Alternative 7.

FIGURE 2.6.7

I-215/Barton Road Interchange Improvement Project

Key View 4 Close-up

SOURCE: Focus 360

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Existing Key View 5 from La Crosse Avenue, west of I-215, facing southeast.

Key View 5 View Simulation of Modified Alternative 7.

FIGURE 2.6.8

I-215/Barton Road Interchange Improvement Project

Key View 5

SOURCE: Focus 360

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Table 2.6.F Key View 4, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Moderate level of vividness with roadway, landscaping, and sky features.	4	Roadway, utility lines, commercial uses, and construction activity contribute to the lack of integrity.	3	Relatively low elevation of buildings and lack of distinctive natural features result in low disruption to harmony.	3	3.3
Proposed View						
Vividness decreases with the increase in manmade features.	3.5	Additional encroachments are present with the proposed view.	2.5	Addition of the roundabout provides coherence to the roadway view.	3.5	3.2
Difference from Existing Visual Quality						**-0.1**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

Changes to this viewscape represent the typical changes to views from one of the I-215 southbound ramps towards Barton Road. Modified Alternative 7 would require full acquisition of the commercial parcel that contains Demetri's Restaurant to accommodate the proposed southbound off-ramp, roundabout, and Barton Road widening.

The close-up view of Key View 5 (Figure 2.6.9) shows that the roadway features would be improved with the addition of a landscaped roundabout with an architectural feature and pedestrian crosswalks.

Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and Measure VIS-2 includes aesthetic elements for hardscape such as sound barriers. As shown in Table 2.6.G, the overall proposed visual quality of the proposed Key View 5 is moderate (i.e., 4.2), but it is an improvement compared to the existing condition. Implementation of Modified Alternative 7 would improve the visual quality of Key View 5.

Because Modified Alternative 7 would improve the visual environment in Key View 5, and because viewer sensitivity is low and viewer exposure is medium at Key View 5, it is anticipated that the viewer response would be positive from the view point of a motorist at Key View 5. Therefore, visual impacts of Modified Alternative 7 at Key View 5 would not be substantial.

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Key View 5 close-up view simulation of Modified Alternative 7 roundabout.

FIGURE 2.6.9

I-215/Barton Road Interchange Improvement Project

Key View 5 Close-up

SOURCE: Focus 360

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Table 2.6.G Key View 5, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Moderate level of vividness with roadway, mountain, and sky features.	4	Roadway, utility lines, traffic signals, and construction activity contribute to the lack of integrity.	3	Roadway, poles, construction activity disrupt harmony.	2	3.0
Proposed View						
Vividness increases with landscaping	4.5	Encroachments are reduced with the proposed view.	4	Addition of the roundabout provides coherence to the roadway view.	4	4.2
Difference from Existing Visual Quality						**+1.2**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

All Build Alternatives

The analysis of permanent impacts from Key View 6 is applicable for Alternatives 3, 6, and Modified Alternative 7.

Key View 6

The I-215 Bi-County HOV Lane Gap Closure Project will construct a sound barrier along the I-215 northbound on-ramp adjacent to Grand Terrace Elementary School. The proposed views would include grass, trees, and playground fencing and equipment in the foreground. Middleground views would include a playground ball field, playground equipment, fencing, grass, and trees. Background views would include trees, the sound barrier, obstructed views of the La Loma Hills, and sky. As seen in Key View 6 (Figure 2.6.10), construction of the sound barrier would remove trees, fencing, I-215, and vehicles from the view. Removal of the mature trees associated with the I-215/Barton Road Interchange Project would provide a broader view of La Loma Hills.

Measure VIS-1 requires implementation of a Landscape Plan that would minimize impacts related to the removal of landscaping, and Measure VIS-2 includes aesthetic elements for hardscape such as sound barriers. As shown in Table 2.6.H, the overall proposed visual quality of Key View 6 is moderate (i.e., 4.3 for Alternative 3 and Modified Alternative 7 and 4.0 for Alternative 6) due to the grass, trees, and enclosed

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Existing Key View 6 from Grand Terrace Elementary School playground facing northwest.

Key View 6 simulation of Alternative 3, 6, or Modified Alternative 7.

FIGURE 2.6.10

I-215/Barton Road Interchange Improvement Project

Key View 6

SOURCE: SoftMirage, 11/2010

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Table 2.6.H Key View 6, Existing and Proposed Visual Quality

Vividness (V)		Intactness (I)		Unity (U)		Overall Visual Quality
Features	**Rating**	**Encroachment**	**Rating**	**Elements**	**Rating**	**([V+I+U]/3)**
Existing View						
Playground and landscaping are vivid striking features.	5	Integrity negatively impacted by presence of I-215.	3	Unity negatively impacted by presence of I-215.	4	4
Proposed View-Alternative 3						
Improvements eliminate view of I-215 and mature landscaping.	5	Sound barrier removes view of I-215.	4	Sound barrier provides unity of the space.	4	4.3
Difference from Existing Visual Quality						**+0.3**
Proposed View-Alternative 6						
Improvements eliminate view of I-215 and mature landscaping.	5	Sound barrier removes view of I-215.	3	Sound barrier provides unity of the space.	4	4
Difference from Existing Visual Quality						**0**
Proposed View- Modified Alternative 7 (Preferred Alternative)						
Improvements eliminate view of I-215 and mature landscaping.	5	Sound barrier removes view of I-215.	4	Sound barrier provides unity of the space.	4	4.3
Difference from Existing Visual Quality						**+0.3**

Source: VIA (November 2013).
Rating Scale: 1–7 (1 = very low, 2 = low, 3 = moderately low, 4 = moderate, 5 = moderately high, 6 = high, 7 = very high)

playground separated from I-215. It is anticipated that the viewer response to the visual changes would be positive, as the potential sound barrier would not obstruct views of any substantial scenic resources and would provide the school with a visual sense of unity by separating it from I-215. Therefore, visual impacts of Alternatives 3, 6, and Modified Alternative 7 at Key View 5 would not be substantial.

Visual Impact Summary

As discussed above, the visual quality of Key View 1 would be reduced by 0.3, the visual quality of Key View 2 would be reduced by 0.7, and the visual quality of Key View 3 would be reduced by 1.0. The visual quality of Key View 4 would be reduced by 0.1 and the visual quality of Key View 5 would be improved by 1.2. Key View 6 would increase by 0.3 for Alternative 3 and Modified Alternative 7 and by 0 for Alternative 6. Although Alternatives 3 and 6 would result in a reduction in visual quality for most of the key views, this reduction would not be substantial. Although the visual quality of most of the key views would be reduced, the key views would be consistent with views of and around a freeway. Overall, Modified Alternative 7 would improve the key views. Implementation of any of the Build Alternatives would be consistent with the *I-215 Bi-County Aesthetic Concept* as discussed in Minimization Measures VIS-1 and VIS-2. None of the view points currently have

unobstructed views of visual resources such as the La Loma Hills or Blue Mountain. Therefore, implementation of any of the alternatives would have a low-level visual impact on the Project area due to the low-level existing visual quality, and any impact to visual resources resulting from the Build Alternatives would not be considered substantial. Thus, no specific mitigation is required.

Light and Glare

The study area receives light at night from traffic, street lighting, and lighted parking lots; signalization at the intersections and freeway on- and off-ramps; and commercial zone and limited light sources from residential development. Existing lighting on the streets and along the ramps would be replaced as a part of Alternatives 3, 6, and Modified Alternative 7. Minimization Measure VIS-3 would minimize potential impacts regarding light and glare. Therefore, impacts related to light and glare would not be substantial.

Compatibility with Visual Resource Policies

While the La Loma Hills and Blue Mountain are located within the viewshed of the study area, distant views of the La Loma Hills and/or Blue Mountain are obstructed by existing development. Because of the visual obstructions, there are no outstanding scenic vistas and/or visual features that would potentially be impacted by any of the Build Alternatives. Construction of the alternatives will require removal of trees. Any tree removal on public land beyond the Project right of way must comply with City landscaping policies, as provided in Measure VIS-1. Therefore, the Project would not conflict with any local plans, policies, goals, or Municipal Code regulations of the City of Grand Terrace.

2.6.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures are required to minimize permanent visual impacts of Alternatives 3, 6, and Modified Alternative 7.

VIS-1 **Landscape Plan.** A landscape plan will be prepared that identifies all opportunities to use areas within the State right of way for full landscaping consistent with the *Interstate 215 (I-215) Bi-County Aesthetic Concept*. This will include landscaping for graded areas with plant species consistent with adjacent vegetation and enhancement of new Project structures (ramps, sound barriers, and retaining walls) to the extent feasible. This plan will incorporate all applicable procedures and requirements detailed in the California Department of

Transportation (Caltrans) *Highway Design Manual*, Section 902.1, Planting Guidelines (November 2001), and individual local policies as applicable.

VIS-2 **Hardscape Plan.** A Hardscape Plan with aesthetic enhancements of retaining and sound barriers, bridges, and other hardscape will be incorporated into the final design of the Project consistent with the *I-215 Bi-County Aesthetic Concept* and applicable goals and policies in the affected City General Plan. The design of all hardscape features is required to comply with Caltrans standards for sound attenuation (where the walls/barriers provide that function), safety requirements, and other pertinent standards. The design of sound barriers requires compliance with the Caltrans *Highway Design Manual* Standards, and aesthetic treatments will be reviewed and approved by the Caltrans District 8 Landscape Architect. The sound barriers should include the following features:

a. Aesthetic treatments will be incorporated into barrier designs to increase the visual quality of the area and to provide an expression of the regional "sense of place."
b. To the maximum extent feasible, trees and shrubs will be provided in available spaces, and textured walls and vines will be used on barriers to soften the appearance of the wall and deter graffiti.

VIS-3 **Lighting.** The lighting fixtures will be selected and installed to minimize glare on adjacent properties and into the night sky. Lighting will be shielded with nonglare hoods and focused within the Project right of way. The lighting plan will be reviewed and approved by the Caltrans District 8 Landscape Architect prior to construction to ensure compliance with these criteria.

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

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

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the National Register of Historic Places listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way.

2.7.2 Affected Environment

This section is based on the *Historic Property Survey Report* (July 2011), *Archaeological Survey Report* (July 2011), and *Historical Resources Evaluation Report* (July 2011). The *Historic Property Survey Report* (November 2010) and the *Historical Resources Evaluation Report* (July 2011) prepared for the Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project were also utilized in the analysis contained in this section.

An Area of Potential Effects (APE) was developed for the Project that includes the limits of construction and staging areas for Alternatives 3, 6, and Modified Alternative 7, as well as parcels containing built environment that could be subject to indirect effects. The Project APE is generally characterized by suburban development in the cities of Colton and Grand Terrace and includes a mix of historic-period and modern multifamily and single-family residences, commercial businesses, and manufacturing businesses; two mobile home parks; and undeveloped land; as well as segments of I-215 and of the BNSF Railway and the Union Pacific Railroad (UPRR).

The archaeological study area (ASA) is within the APE and includes all areas within the construction limits, including areas that will be used for temporary staging and signage.

2.7.2.1 Records Search

On April 17, 2008, a records search was conducted by personnel at the San Bernardino Archaeological Information Center (SBAIC) of the California Historical Resources Information System (CHRIS) located at the San Bernardino County Museum in Redlands, California. It included a review of all recorded historic and prehistoric archaeological sites within a 0.5 mile (mi) radius of the APE, as well as a review of known cultural resource survey and excavation reports. In addition, the following inventories were examined:

- National Register of Historical Resources (National Register)
- California Register of Historical Resources (California Register)
- California Historical Landmarks
- California Points of Historical Interest
- California Department of Transportation (Caltrans) Historic Highway Bridge Inventory

In addition, background research was conducted for the APE using published literature in local and regional history, online resources regarding the history and

development of the City of Grand Terrace, and historic aerial photographs and maps of the Project vicinity. The repositories and resources that were contacted to access historical information pertinent to the parcels within the Project APE and the Project vicinity are discussed in further detail in Chapter 3, Comments and Coordination.

2.7.2.2 Field Survey

On June 26 and November 5, 2008, and May 19, 2009, archaeological surveys of the ASA were conducted for the Project. Only part of the ASA consisting of undeveloped parcels contained bare ground that could be systematically surveyed. Those parts of the ASA were systematically surveyed by intensively examining the ground surface at a maximum transect width of 30 feet (ft). Ground surface visibility was excellent, and no archaeological cultural material was observed. The ground surface of the ASA contained abundant modern concrete and asphalt rubble and other modern trash. The remainder of the ASA was examined wherever ground visibility permitted, such as road shoulders. The only archaeological resource identified within the ASA is a small concrete slab foundation with no associated artifacts.

On May 18, June 20, June 26, July 8, November 4 and 5, 2008, and May 19 and 28, and July 14, 2009, surveys of the Project APE were conducted for architectural resources. Each building in the APE was observed from the public right of way and in some cases from private driveways. During the surveys, notations regarding the apparent age and integrity of each building were made on field maps. In addition, notations were made regarding the location, type, and condition of all buildings that appeared to be 45 years of age or older, and photographs were taken of some buildings.

Based on the reconnaissance-level surveys and basic property-specific research, the majority of buildings in the APE were determined to meet the criteria for classification under Property Types 2–4 and 6 as defined in Attachment 4 (Properties Exempt from Evaluation) in the Caltrans Section 106 PA and, therefore, were not further documented. Most of the buildings that were found to be exempt are modern, substantially altered, or mobile homes.

Intensive field surveys of the remaining buildings and features were conducted on July 8 and November 4, 2008, and on May 28, and July 14, 2009. During these surveys, architectural historians walked along the public right of way and photographed and made detailed notations of the structural and architectural characteristics, current conditions, settings, and associated features of each building.

2.7.2.3 Native American Consultation

On April 8, 2008, a letter was sent to the Native American Heritage Commission (NAHC) requesting a search of the Sacred Lands File in order to identify areas of religious or cultural significance to Native Americans. The NAHC responded on April 10, 2008, to say that the Sacred Lands File search was negative for the immediate APE.

In addition, a letter (dated May 9, 2008) that discussed the Project and requested information on cultural resources in the area that may be significant to their communities was sent via certified mail to the following:

- Cahuilla Band of Indians: Anthony Madrigal, Jr., Chairperson
- Ti'At Society: Cindi Alvitre
- Gabrieleno/Tongva Indians: Anthony Morales, Chairperson
- Ramona Band of Mission Indians: Joseph Hamilton, Vice Chairman
- Gabrielino/Tongva Council/Gabrielino Tongva Nation: Sam Dunlap, Tribal Secretary
- San Manuel Band of Mission Indians: John Ramos, Chairperson
- Gabrielino Band of Mission Indians of California: Susan Frank
- Morongo Band of Mission Indians: Michael Contreras, Cultural Resources
- San Manuel Band of Mission Indians: Ann Brierty, Environmental Department
- Serrano Nation of Indians: Goldie Walker

Responses from and consultation with the Native American representatives are discussed in more detail in Chapter 3.0, Comments and Coordination. Of the Native Americans reached, Mr. Morales and a relative of Ms. Walker stated they would like to be notified of any cultural resources discoveries. No responses were received from any of the other Native Americans contacted, although follow-up calls were made between May 27 and June 24, 2008.

2.7.2.4 Cultural Resources within the APE

The records search revealed that 24 cultural resources studies have previously been conducted and 10 historic sites have been recorded within the 0.5-mile (mi) radius of the APE. Seven of these previously conducted studies covered portions of the APE, resulting in the entire APE having been previously surveyed. These previous studies resulted in the recordation of the following eight historic-period resources within or adjacent to the APE: CA-SBR-6101H (UPRR); CA-SBR-6847H (BNSF Railway; formerly the Atchison, Topeka, and Santa Fe Railroad); 36-021705, 36-021706, 36-

021707, and 36-021708 (single-family residences); CA-SBR-4787H/7169H (Riverside Warm Creek Canal); and CA-SBR-7168H (Gage Canal). As discussed below, none of these resources appear eligible for listing in the National Register.

Of the eight previously evaluated resources, six were evaluated as part of the I-215 Bi-County HOV Lane Gap Closure project. These included the two railroad segments and four single-family residences. The segments of the UPRR and the BNSF Railway that are within the APE were evaluated in 2009 and concurred with by the SHPO in 2010 as not eligible for listing in the National Register either individually or as contributing segments to the overall alignments. The four single-family residences were evaluated in 2008 and 2009 and concurred with by the SHPO in 2010 as not eligible for listing in the National Register.

The two remaining previously evaluated properties (the Riverside Warm Creek Canal and the Gage Canal) were determined not to be within the vertical APE and are, therefore, outside the Project APE. Riverside Canal would be avoided by Alternative 3 and would be bridged by Alternatives 6 and Modified Alternative 7. Gage Canal is below the ground surface in the Project area and would not be impacted by the Build Alternatives. Therefore, these properties were not evaluated for eligibility for listing in the National Register.

In addition to the six previously evaluated properties discussed above, an additional eight historic-period built environment resources were identified and evaluated. These resources are related to the themes of residential and commercial architecture and include a Ranch-style service station constructed sometime between 1959 and 1966; a vernacular multitenant commercial center with Modern elements constructed between 1959 and 1966; and 1 duplex and 5 single-family residences constructed from the 1940s through the 1960s in the Minimal Traditional and California Ranch styles. None appear to be eligible for listing in the National Register, and none appear to qualify as historical resources as defined by CEQA.

Five State agency bridges were within the APE. State agency bridges 540518 (BNSF Railway bridge), 540519 (UPRR bridge), 540527 (Iowa Avenue Overcrossing), 540528 (Barton Road Overcrossing), and 540529 (Newport Avenue Overcrossing) were all constructed in 1959. With the exception of bridges 540518 and 540519, they are listed in the California Historical Significance State Agency Bridge List of August 2010 as Category 5 Bridges and are not eligible for the National Register. Bridges 540518 and 540519 are railroad bridges that were recently (2009) evaluated as part of

the I-215 Bi-County HOV Lane Gap Closure Project and concurred with by SHPO in 2010 as not eligible for the National Register. Therefore, none of the bridges are subject to evaluation. The UPRR bridge and the Newport Overcrossing have since been removed as part of the I-215 Bi-County HOV Lane Gap Closure Project.

Two local agency bridges were within the APE. Local agency bridge No. 54C0001 was constructed in 1936, and local agency bridge No. 54C0379 was constructed in 1929 and widened in 1941. The bridges are listed in the California Historical Significance Local Agency Bridge List of August 2010 as Category 5 Bridges and are not eligible for the National Register. Therefore, these bridges are also not subject to evaluation.

The remaining cultural resources that were identified within the APE are Property Types 2–4 and 6 under the Caltrans Section 106 PA and were therefore exempt from evaluation.

2.7.3 Environmental Consequences

2.7.3.1 Temporary Impacts

Alternatives 1, 3, 6, and Modified Alternative 7 (Preferred Alternative)

Any impacts to buried resources as a result of the No Build Alternative or the Build Alternatives would be considered permanent; therefore, an analysis of temporary impacts is not applicable.

2.7.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative would not result in ground disturbance or excavation; therefore, no impacts to cultural resources would occur. Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The I-215 Bi-County HOV Lane Gap Closure Project involves ground disturbance and excavation within the Project area. This approved Project includes measures to avoid impacts to cultural resources, and no impacts will occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Based on the findings reported in the *Historic Property Survey Report*, there are no Section 106 Historic Properties or CEQA Historical Resources within the APE. All cultural resources that required evaluation were determined to be ineligible for the

National Register of Historic Places (National Register) through consultation with SHPO. On September 9, 2011, SHPO concurred with Caltrans' determination that the eight properties that were evaluated as part of this study were not eligible for the National Register. Therefore, Caltrans determined that, pursuant to Stipulation IX.A of the Section 106 PA, a finding of No Historic Properties Affected is appropriate for this undertaking. Similarly, Caltrans has determined that a finding of No Impact is appropriate pursuant to CEQA Guidelines Section 15064.5(b)(3) because there are no Historical Resources within the Project area limits.

Although considered unlikely, there is the potential to encounter unknown buried cultural materials or human remains within the APE during construction of the Project. In the event that previously unknown buried cultural materials or human remains are encountered during construction, compliance with standard Measures CR-1 and CR-2, provided below, would avoid and/or minimize potential impacts to previously unknown cultural resources or human remains.

There are no National Register listed or eligible resources in the Project area that would trigger the requirements for protection under Section 4(f).

2.7.4 Avoidance, Minimization, and/or Mitigation Measures

The measures below are required to avoid the potential Project impacts related to the discovery of previously unknown cultural materials and human remains during construction:

CR-1 **Cultural Materials.** If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

CR-2 **Human Remains.** If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County of San Bernardino Coroner 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 (NAHC), which will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the California Department of Transportation District 8 Environmental Cultural

Studies Branch Chief so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

PHYSICAL ENVIRONMENT

2.8 Water Quality and Storm Water Runoff

2.8.1 Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[1] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the State that the discharge will comply with other provisions of the act. (Most frequently required in tandem with a Section 404 permit request see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits, Regional permits and Nationwide permits. Regional

[1] A point source is any discrete conveyance such as a pipe or a man-made ditch.

permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with United States Environmental Protection Agency (EPA) Section 404 (b)(1) Guidelines (U.S. EPA Code of Federal Regulations [CFR] 40 Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[1] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the State. It predates the CWA and regulates discharges to waters of the State. Waters of the State include more than just Waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this

[1] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, nonpoint, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **National Pollutant Discharge Elimination System (NPDES) Program**

Municipal Separate Storm Sewer Systems

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town,

county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified the California Department of Transportation (Caltrans) as an owner/operator of an MS4 under federal regulations. Caltrans' MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans' MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and nonstorm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in storm water and nonstorm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices (BMPs). The proposed Project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-0009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development.

By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Caltrans Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

Municipal NPDES Permit

The Cities of Colton and Grand Terrace are co-permittees under the NPDES Permit and Waste Discharge Requirements for the San Bernardino County Flood Control District, the County of San Bernardino, and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Order No. R8-2010-0036 (NPDES No. CAS618036). The NPDES permit prohibits discharges, sets limits on pollutants being discharged into receiving waters, and requires implementation of technology-based standards.

Under the NPDES permit, the Cities as co-permittees are responsible for the management of storm drain systems within their jurisdictions. The Cities are required to implement management programs, monitoring programs, implementation plans, and all BMPs outlined in the Municipal Storm Water Management Program (MSWMP) (previously identified as the Drainage Area Management Plan [DAMP] in the County's two prior NPDES permits) and to take any other actions as may be necessary to protect water quality to the Maximum Extent Practicable (MEP). In

addition, each city is required to implement a MSWMP and develop a long-term assessment strategy for effectiveness of the MSWMP.

Category Projects within the Cities are required to develop and implement Water Quality Management Plans (WQMPs) to reduce pollutants and maintain and reduce downstream erosion and stream habitat from all new development and significant redevelopment projects that fall into one of the categories of priority projects. The co-permittees must ensure that a Category Project meets WQMP requirements. Category Projects include significant redevelopment projects that create 5,000 square feet (sf) or more of impervious surface, home subdivisions of 10 units or more, industrial/ commercial developments of 100,000 sf or more, automotive repair shops, restaurants of 5,000 sf or more, hillside developments of 10,000 sf or more, developments of 2,500 sf of impervious surface or more adjacent to or discharging directly into environmentally sensitive areas, or parking lots of 5,000 sf or more. In addition, Non-Category Projects that have a precise plan of development (e.g., all commercial or industrial projects, residential projects <10 dwelling units, and all other land development projects with potential for significant adverse water quality impacts) or subdivision of land must prepare and implement a WQMP. San Bernardino County has prepared a Model Water Quality Management Plan Guidance document for preparation of project-specific WQMPs. The Model Water Quality Management Plan Guidance document was approved by the Santa Ana RWQCB on April 30, 2004, and updated on June 9, 2005.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water body must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting

or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.8.2 Affected Environment

This section is based on the *Water Quality Technical Study* (October 2013) prepared for the Project.

2.8.2.1 Surface Water

The Project area is within the Riverside subwatershed of the Middle Santa Ana River Watershed. The Santa Ana River, Reach 4 (from Mission Boulevard in Riverside to the San Jacinto Fault in San Bernardino), runs almost parallel to Interstate 215 (I-215) to the west and northwest. The Santa Ana River, Reach 4, is approximately 0.75 mile (mi) south of the Project site and is a receiving water for runoff from the Project Site. The Riverside Canal is in the Project area and crosses Barton Road at Grand Terrace Road. The Gage Channel is east of the Project area and crosses Barton Road halfway between Michigan Avenue and Mount Vernon Avenue. The Highgrove Channel is almost parallel to the Riverside Canal in the southern part of the Project area. In addition, there are three small unnamed concrete-lined channels and one earthen unnamed channel in the northern part of the Project area.

The following beneficial uses are identified in the Santa Ana RWQCB's Basin Plan (*Santa Ana River Basin Water Quality Control Plan*, updated February 2008) for Reach 4 of the Santa Ana River:

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

Primary water quality concerns in the Middle Santa Ana River Basin (Basin) include total dissolved solids (TDS), total inorganic nitrogen levels, contaminant plumes in groundwater, bacterial quality of surface waters, and impacts from confined animal feeding operations.

The SWRCB approved the 2010 Integrated Report (CWA Section 303(d) List/305(b) Report) on August 4, 2010. On November 12, 2010, the EPA approved the 2010 California 303(d) List of Water Quality Limited Segments. Reach 4 of the Santa Ana

River is listed as impaired for pathogens on the 2010 California 303(d) List of Water Quality Limited Segments. The potential source of the pathogen impairment is listed as a nonpoint source. The proposed TMDL completion date is January 1, 2019.

2.8.2.2 Groundwater

As designated by the Santa Ana RWQCB (Region 8), the Project area is within the Riverside-F Groundwater Management Zone.

Groundwater in the Riverside-F Groundwater Management Zone is found primarily in alluvial deposits and is replenished by infiltration from Santa Ana River flow, underflow past the Rialto-Colton Fault, intermittent underflow from the Chino Subbasin, return irrigation flow, and deep percolation of precipitation.

Depth to groundwater in the Project area is anticipated to be greater than 30 feet (ft) below ground surface (bgs).

The following beneficial uses are identified in the Basin Plan for the Riverside-F Groundwater Management Zone:

- GWR: Groundwater Recharge
- AGR: Agricultural Supply
- IND: Industrial Service Supply
- PROC: Industrial Process Supply

Groundwater in the basin is predominantly calcium-sodium bicarbonate-based. TDS range from 320 to 756 milligrams per liter (mg/L). According to the Basin Plan, the current ambient nitrate level in the Riverside-F Groundwater Management Zone is 9.5 mg/L, which is the same as the Basin Plan Water Quality Objectives.

The Project area is not in a "high-risk" area, which is defined as a location where spills from the State-owned rights-of-way, activities, or facilities can discharge directly to municipal or domestic water supply reservoirs or groundwater percolation facilities.

2.8.3 Environmental Consequences

2.8.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative does not include ground disturbance activities; therefore, no temporary impacts to water quality would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Pollutants of concern during construction of the Build Alternatives include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on surface water or groundwater quality.

During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion compared to existing conditions. In addition, chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction of Alternatives 3, 6, and Modified Alternative 7 with the potential to be transported via storm runoff into receiving waters. During construction, the total disturbed area under Alternative 3 would be approximately 40.4 acres (ac); under Alternative 6, it would be approximately 33.6 ac; and under Modified Alternative 7, it would be approximately 29.5 ac. Therefore, Modified Alternative 7 would have the lowest potential to impact water quality based on soil erosion. Dewatering is not anticipated during construction of the Project.

Facility improvements would occur in the vicinity of the drainages within the Project limits. In addition, drainage improvements, discussed in detail in Chapter 1, would be constructed. During construction of these improvements, chemicals, liquid products, petroleum products, and concrete-related waste spills would have a higher potential to impact water quality due to the proximity of these surface waters to Project construction activities.

Under the Construction General Permit, the Project would be required to prepare a SWPPP and implement construction BMPs detailed in the SWPPP during construction activities. Construction BMPs would be designed to minimize erosion and prevent spills. The SWPPP would be developed and construction BMPs selected and implemented to target pollutants of concern during construction such that storm water discharges and authorized nonstorm water discharges would not cause or contribute to any violations of applicable water quality standards or objectives or substantially impact human health or the environment. When construction BMPs are properly designed, implemented, and maintained to address pollutants of concern, as described in Measure WQ-1, no substantial surface water or groundwater quality impacts would occur during construction of the Project.

2.8.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, no permanent impacts to water quality will occur. However, runoff from the interchange would remain untreated.

Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The I-215 Bi-County HOV Lane Gap Closure Project will increase impervious area in the Project area, resulting in an increase in long-term pollutant loading. Measures to minimize water quality impacts associated with the I-215 Bi-County HOV Lane Gap Closure Project are being implemented, and no substantial impacts will occur.

Alternative 3 (Partial Cloverleaf Interchange)

Alternative 3 would result in a permanent decrease in impervious surface area of 5.9 ac compared to the footprint of the existing interchange, which would result in a decrease in runoff and pollutant loading in the interchange area. The reason for the decrease in impervious area is because Alternative 3 would fully acquire many developed properties, the remainder of which would be converted to undeveloped/landscaped land. Because the impervious area would decrease, Treatment BMPs are not required to be considered for this Alternative.

Currently, runoff from I-215/Barton Road in the Project limits is untreated. Although not required, operational BMPs would be implemented to target constituents of concern in runoff from the Project area (Measure WQ-2). Proposed Treatment BMPs include biofiltration swales (bioswales). Bioswales are vegetated channels that convey storm water and remove pollutants by filtration through grass, sedimentation, adsorption to soil particles, and infiltration through soil. Bioswales are effective at removing total suspended solids, nutrients, metals, turbidity, and oil and grease. Potential locations for the Treatment BMPs include areas adjacent to ramps and the I-215 mainline.

The Treatment BMPs would target constituents of concern from transportation facilities (total suspended solids, nutrients, metals, turbidity, and oil and grease). Reach 4 of the Santa Ana River is listed as impaired for pathogens on the 2010 California 303(d) List of Water Quality Limited Segments. Highway facilities do not appear to be a substantial source of pathogens in urban drainage, and pathogens are

not among Caltrans Target Design Constituents. Although the biofiltration swales would not specifically target pathogens, they would reduce pathogen levels by collecting pathogens adsorbed onto sediments. Therefore, Alternative 3 would not be a substantial source of pathogens or contribute to the existing impairment.

Because treatment BMPs would treat pollutants of concern from runoff from the Project area, Alternative 3 would not impact downstream receiving waters or cause or contribute to a violation of water quality standards or objectives. In addition, because the proposed BMPs would remove pollutants of concern from storm water, runoff from Alternative 3 would not contain pollutants in quantities that would create a condition of nuisance or substantially affect beneficial uses of waters of the State. Therefore, Alternative 3 would not result in substantial impacts to surface water or groundwater quality.

Alternative 6 (Modified Cloverleaf Interchange) and Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Alternative 6 would increase the impervious surface area by 3.2 ac compared to existing conditions, which is the greatest increase of all Build Alternatives. Modified Alternative 7 would increase the impervious surface area by 1.2 ac. An increase in impervious area would increase the volume of runoff during a storm, which would more effectively transport pollutants to receiving waters. Compared to existing conditions, runoff under Alternative 6 and Modified Alternative 7 would be expected to contain higher concentrations of sediments, trash, petroleum products, metals, and chemicals, which are pollutants associated with road runoff.

Currently, runoff from I-215/Barton Road in the Project limits is untreated. As part of Alternative 6 and Modified Alternative 7, operational BMPs would be implemented to target constituents of concern in runoff from the Project area. Proposed Treatment BMPs include biofiltration swales (bioswales) in areas adjacent to ramps and the I-215 mainline.

The Treatment BMPs would target constituents of concern from transportation facilities (total suspended solids, nutrients, metals, turbidity, and oil and grease). Reach 4 of the Santa Ana River is listed as impaired for pathogens on the 2010 California 303(d) List of Water Quality Limited Segments. Highway facilities do not appear to be a substantial source of pathogens in urban drainage, and pathogens are not among Caltrans Target Design Constituents. Although the biofiltration swales would not specifically target pathogens, they would reduce pathogen levels by

collecting pathogens adsorbed onto sediments. Therefore, Alternatives 6 and Modified Alternative 7would not be a substantial source of pathogens or contribute to the existing impairment.

Because treatment BMPs would treat pollutants of concern from runoff from the Project area, Alternative 6 and Modified Alterative 7 would not impact downstream receiving waters or cause or contribute to a violation of water quality standards or objectives. In addition, because the proposed BMPs would remove pollutants of concern from storm water, runoff from Alternative 6 and Modified Alternative 7 would not contain pollutants in quantities that would create a condition of nuisance or substantially affect beneficial uses of waters of the State. Therefore, when BMPs are implemented in accordance with NPDES permit requirements as stipulated in Measure WQ-2, Alternative 6 and Modified Alternative 7 would not result in substantial impacts to surface water or groundwater quality.

Comparison of Build Alternatives

The water quality impacts of the Build Alternatives are summarized in Table 2.8.A.

Table 2.8.A Water Quality Impacts Comparison for Build Alternatives

Build Alternative	Disturbed Soil Area (acre)	Increase in Impervious Surface Area (acre)	Proposed Treatment/Operational BMPs
Alternative 3 (Cloverleaf Interchange)	40.4	-5.9	Biofiltration swales
Alternative 6 (Modified Cloverleaf Interchange)	33.6	+3.2	Biofiltration swales
Modified Alternative 7 (Modified Cloverleaf/ Diamond) (Preferred Alternative)	29.5	+1.2	Biofiltration swales

2.8.4 Avoidance, Minimization, and/or Mitigation Measures

The measures below will be implemented for each of the Build Alternatives to minimize impacts.

WQ-1 **General Permit (Construction).** Construction will comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, NPDES No. CAS000002), and any subsequent permit as they relate to construction activities for the Project. This will include submission of the Permit Registration Documents, including a Notice of Intent

(NOI), risk assessment, site map, Storm Water Pollution Prevention Plan (SWPPP), annual fee, and signed certification statement to the State Water Resources Control Board (SWRCB) at least 14 days prior to the start of construction. The SWPPP will meet the requirements of the Construction General Permit, which includes identifying potential pollutant sources associated with construction activities; identifying nonstorm water discharges; developing a water quality monitoring and sampling plan; and identifying, implementing, and maintaining Best Management Practices (BMPs) to reduce or eliminate pollutants associated with the construction site. The BMPs identified in the SWPPP will be implemented during Project construction. A Notice of Termination (NOT) will be submitted to the SWRCB upon completion of construction and stabilization of the site.

WQ-2 **Stormwater Management and NPDES Permits.** Caltrans and City/County NPDES permit requirements will be followed for the operation of Post-Construction Treatment BMPs for the Project. This will include coordination with the Santa Ana Regional Water Quality Control Board (RWQCB) with respect to feasibility, maintenance, and monitoring of Treatment BMPs.

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2.9 Geology/Soils/Seismic/Topography

2.9.1 Regulatory Setting

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

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The California Department of Transportation (Caltrans) Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using Caltrans' Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

2.9.2 Affected Environment

The section is based on the *Revised Preliminary Geotechnical Report/Structures Design Report* (March 2009), the *Revised Addendum to Structure Preliminary Geotechnical Report* (June 2011), and the *Structure Preliminary Geotechnical Report* (June 2012).

2.9.2.1 Topography

The alignments of existing Interstate 215 (I-215) and Barton Road are relatively flat, ranging from approximately 940 to 1,020 feet (ft) above mean sea level in elevation.

2.9.2.2 Geology

The Project site is within California's Peninsular Ranges Geomorphic Province. The Province is characterized by a complex series of north-west oriented mountain ranges separated by similarly trending faults that extend 125 miles (mi) from the Transverse Ranges and the Los Angeles Basin south to the Mexican border and beyond. The Peninsular Ranges contain extensive Cretaceous plutonic rocks intruded into older metamorphic rocks and deep alluvial-filled valleys. The Project site is situated near the southeastern edge of the upper Santa Ana River Valley. This area is a broad

alluvial-filled basin bounded on the north by the San Gabriel Mountains, on the south by the Jurupa and La Sierra Hills, on the southwest by the Puente and Chino Hills, and on the east by the San Jacinto fault.

Regional geologic maps for the area indicate that the Project site is underlain by Pleistocene alluvial fan deposits. The alluvial fan deposits are derived from the surrounding mountains. Based on available literature, the thickness of alluvium and depth to bedrock in the area is estimated to be on the order of 500 ft. However, granitic bedrock is exposed in the outcrop on the freeway cut slope several hundred feet to the north of the I-215/Barton Road interchange, indicating that bedrock is likely shallower beneath the site. Depth to bedrock beneath the Project site is unknown, but is likely deeper than 50 ft.

2.9.2.3 Soils

The Natural Resources Conservation Service (NRCS) Report and General Soil Map for San Bernardino County[1] describes the soils expected to be found in the study area. The on-site surficial soils within the Project limits are comprised of a variety of sandy loams, including Greenfield sand loam (2–9 percent slopes), Hanford coarse sandy loam (2–9 percent slopes), Monserate loamy sand (2–9 percent slopes), and Saugus sandy loam (30–50 percent slopes). The majority of the soil units have a medium runoff classification, with erosion potential ranging from slight to moderate if the soil is unprotected.

The subsurface conditions at the Project site consist of alternating layers of loose to dense sand, silty sand, sandy silt, and gravel to a depth of approximately 40 ft below the existing grade. Although not documented on the as-built plans for the existing interchange, fill materials appear to have been placed during construction of the embankments and ramps for the bridges. The depth to bedrock is unknown.

Depth to groundwater is anticipated to be greater than 30 ft below ground surface (bgs).

2.9.2.4 Faulting and Seismicity

The Project site is located in the highly seismic Southern California region, within the influence of several fault systems that are considered to be active or sufficiently

[1] United States Department of Agriculture (USDA), 2008, San Bernardino County Southwestern Part, California, (CA677) web soil survey, National Cooperative Soil Survey, at http://websoilsurvey.nrcs.usda.gov/app/

active with well-defined faults. However, no active or potentially active faults have been identified on the Project site. In addition, the site is not located within a designated Alquist-Priolo Earthquake Fault Zone.

The closest active fault to the site is the San Bernardino Section of the San Jacinto fault, located northeast approximately 1.6 mi from the Project site. Numerous other faults may also represent significant hazards. However, the San Bernardino Section of the San Jacinto fault is considered the governing fault for deterministic seismic hazard analysis. The San Bernardino Section of the San Jacinto fault is capable of generating earthquakes with a maximum magnitude (M_{max}) magnitude of 7.5.

Peak ground acceleration (PGA) is a measurement of earthquake acceleration in a particular area and is an important factor for structural engineering against earthquake damage for things such as roads, bridges, and buildings. It can be thought of as how hard the ground may shake in a given geographic area based on several factors such as the distance from an active fault, the maximum expected earthquake from that fault and the underlying geologic units. The PGA at the Project site from the San Bernardino Section of the San Jacinto fault is estimated to be 0.61g.[1]

Figure 2.9.1 illustrates the major fault zones and PBA in the Project area.

2.9.3 Environmental Consequences

2.9.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative does not result in soil disturbance in the Project area and would, therefore, not result in temporary impacts related to geology and soils.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Construction activities for the Project, such as grading and cut-and-fill slopes, would disturb soil and alter existing landforms. Temporary impacts would include soil compaction and an increased possibility of soil erosion. Exposed soils would be particularly prone to erosion during construction of the Project, especially during heavy rains. The Project would be constructed consistent with the specifications in the *Structure Foundation Report* (SFR) and a *Geotechnical Design Report* (GDR) specified in Measure GEO-1. Erosion impacts related to water quality

[1] "g" is a common value of acceleration equal to 32 feet/second^2 (ft/sec^2).

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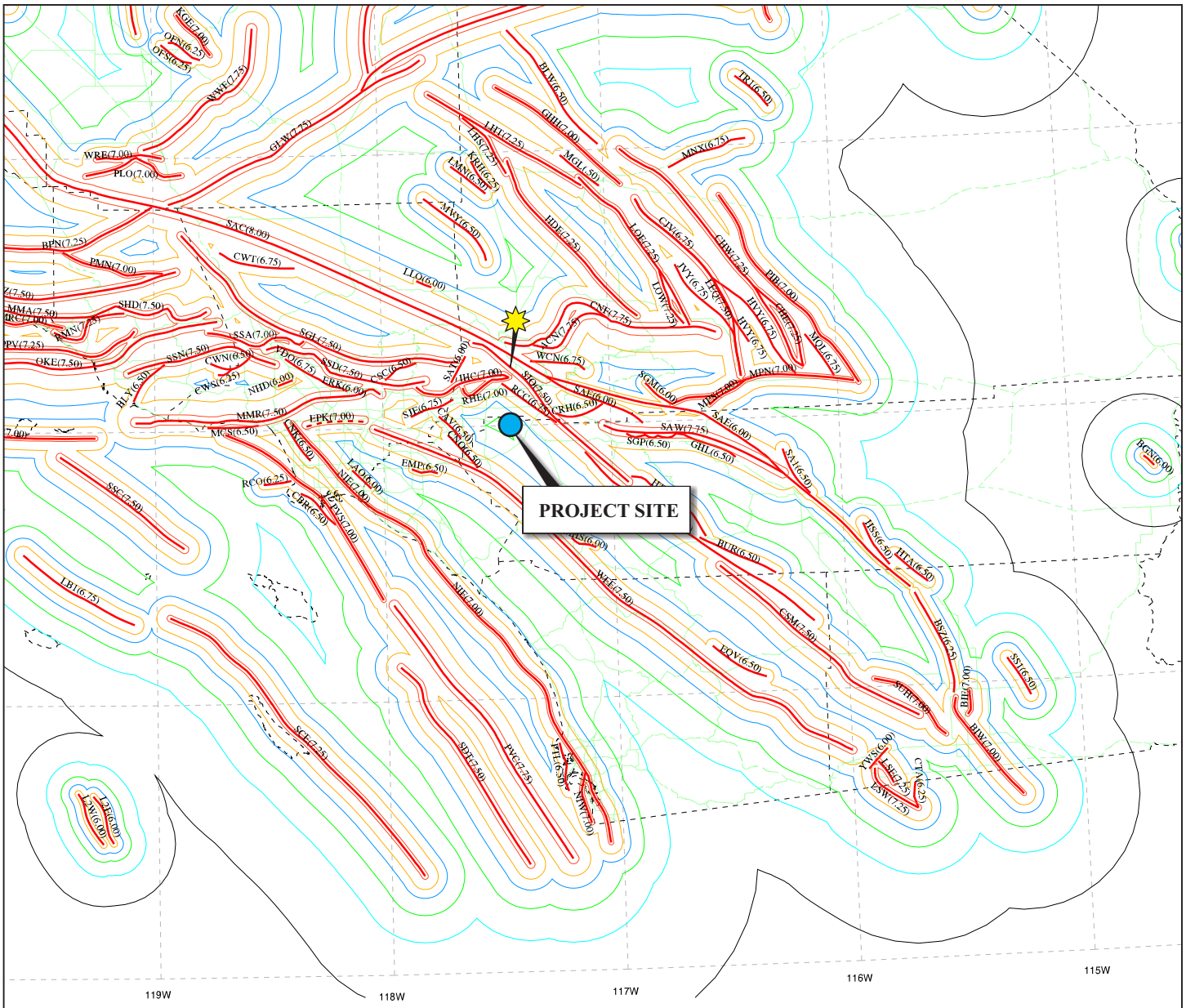

LEGEND

Peak Bedrock Acceleration (PBA)

- 0.7g Peak Acceleration Contour
- 0.6g Peak Acceleration Contour
- 0.5g Peak Acceleration Contour
- 0.4g Peak Acceleration Contour
- 0.3g Peak Acceleration Contour
- 0.2g Peak Acceleration Contour
- 0.1g Peak Acceleration Contour

- Special Seismic Source (SSS)
- Faults with Fault Codes (MCE)
- State Highways
- County Boundary
- Latitude & Longitude

- San Jacinto (SJO) - 1.6 miles from Project Site

FIGURE 2.9.1

N

0 25 50 Miles

I-215/Barton Road Interchange Improvement Project

Fault Zones and Peak Bedrock Acceleration

SOURCE: Based on California Seismic Hazard map & Maximum Credible Earthquakes (MCE), dated 1996

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are evaluated in Section 2.9, Water Quality and Storm Water Runoff. No substantial impacts are anticipated.

2.9.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative would not change the topography in the Project area; therefore, no permanent impacts related to geology and soils would occur.

Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will change the topography in the Project area. Measures to minimize topography impacts associated with the I-215 Bi-County HOV Lane Gap Closure Project are being implemented, and no substantial impacts will occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Fault-Induced Ground Rupture

As discussed above, no active or potentially active faults have been identified on the Project site. In addition, the site is not located within a designated Alquist-Priolo Earthquake Fault Zone. No known active fault traces the Project toward or across the Project site, and the potential for ground surface rupture is considered to be low.

Seismic Ground Shaking

As discussed above, the Project site is located in the highly seismic Southern California region within the influence areas of several fault systems. These fault systems are considered active and well defined and are capable of producing potentially damaging seismic ground shaking. It is recognized that the Project site could periodically experience ground acceleration as the result of moderate to large seismic events.

The structures (e.g., bridges, culverts) constructed for the Project could be potentially subject to substantial impacts related to seismic ground shaking. The Project would be designed in accordance with the requirements of Caltrans Seismic Design Criteria and the American Association of State Highway and Transportation Official's Load and Resistance Factor Design (AASHTO LRFD) Bridge Design Specifications and California Amendments in order to minimize ground shaking impacts.

Secondary Effects of Seismic Shaking

Secondary effects of seismic shaking are nontectonic processes that are directly related to strong seismic shaking. Ground deformation, including fissures, settlement, displacement, and loss of bearing strength are common expressions of these processes and are among the leading causes of damage to structures during moderate to large earthquakes. Secondary effects leading to ground deformation include liquefaction, settlement, and landsliding. Other hazards indirectly related to seismic shaking are inundation, tsunamis, and seiches. These potential secondary effects of seismic shaking on the Project are discussed below.

Liquefaction

Liquefaction is a phenomenon in which saturated, cohesionless soils lose their strength due to the build-up of excess water pressure during cyclic loading such as that induced by earthquakes. The primary factors affecting the liquefaction potential of a soil deposit are: (1) intensity and duration of earthquake shaking; (2) soil type and relative density; (3) overburden pressures; and (4) depth to groundwater. Soils most susceptible to liquefaction are clean, loose, uniformly graded, fine-grained sands and nonplastic silts that are saturated. Silty sands, under certain site conditions, may also be susceptible to liquefaction.

The potential impacts of liquefaction to the site may include: (1) settlement of the ground surface; (2) lateral spreading of the ground; (3) additional downdrag forces on foundation piles as a result of soil settlement above the liquefied layers; and (4) reduction of the shear strength of the liquefied soil, resulting in reduced load-carrying capacity.

Due to the depth to groundwater, which is anticipated to be greater than 30 ft bgs, and based on a preliminary screening-level liquefaction analysis, the site has a low-to-moderate liquefaction potential. However, as detailed in Measure GEO-1, the potential for liquefaction effects on the structures constructed for the Project would be further investigated during final design. If recommended by the geotechnical investigation, final design will include design features related to liquefiable soils. Therefore, no substantial liquefaction impacts would occur.

Collapsible Soils

A collapsible soil is generally defined as a soil that will undergo a sudden decrease in volume when its internal structural support is lost. Soils found to be most susceptible to collapse include loess (fine-grained, wind-deposited

soil) deposits, valley alluvium deposited within a semiarid to arid climate, and residual soil deposits. The Project site is located in a geological area prone to collapsible soil conditions. However, as detailed in Measure GEO-1, the collapse potential of the subsurface soils will be further investigated during final design. If recommended by the geotechnical investigation, final design will include design features related to collapsible soils. Therefore, impacts related to collapsible soils would not be substantial.

Seismically Induced Landslides

Marginally stable slopes may be subject to landsliding caused by seismic shaking. In most cases, this is limited to relatively shallow soil failures on steeper natural slopes, although deep-seated failures of oversteepened, engineered slopes are also possible. There are no natural slopes within the Project limits; therefore, there is no potential for landsliding of natural slopes. The only slopes within the Project area are graded cut-and-fill slopes constructed for the existing mainline and interchange ramps. As detailed in Measure GEO-1, the stability of future cut-and-fill slopes under static gravitational forces and pseudostatic loading conditions will be further evaluated during final design. If recommended by the geotechnical investigation, final design will include design features related to slope instability. Therefore, no substantial impacts related to slope instability would occur.

Seismically Induced Inundation

Strong seismic ground motion can cause dams and levees to fail, resulting in damage to structures and properties located downstream of those water retention facilities. There are no dams or substantial bodies of water on, in the immediate vicinity of, or immediately upstream of the Project site. The Project site is not within an inundation zone of a dam. Therefore, the Project would not be substantially impacted by seismically induced inundation.

Tsunamis and Seiches

A tsunami, or seismically generated sea wave, is generally created by a large, distant earthquake occurring near a deep ocean trough. A seiche is an earthquake-induced wave in a confined body of water such as a lake or reservoir. Damage from tsunamis is typically confined to coastal areas that are 20 ft or less above mean sea level. The Project site is not near the coast or any confined bodies of water. Therefore, the Project is not at risk of inundation from a tsunami or seiche.

Corrosive Soils

Corrosive soils contain constituents or physical characteristics that react with concrete (water-soluble sulfates) or ferrous metals (chlorides, low percentage of hydrogen levels, and low electrical resistivity). Fine-grained soils (predominantly clays) are the typical soil types responsible for corrosive site conditions. No subsurface investigation or laboratory testing has been conducted during the preliminary engineering phase of this Project to date. However, as detailed in Measure GEO-1, the potential for soil corrosion effects on the Project structures will be investigated during final design. If recommended by the geotechnical investigation to be prepared during Plans, Specifications and Estimates (PS&E), final design will include design features related to corrosive soils.

2.9.4 Avoidance, Minimization, and/or Mitigation Measures

The minimization measure below is required to reduce the potential impacts associated with geotechnical and soil conditions on structures constructed under Alternatives 3, 6, and Modified Alternative 7:

GEO-1 **Geotechnical Investigation.** During the Plans, Specifications, and Estimates (PS&E) phase, a detailed geotechnical investigation will be conducted by qualified geotechnical personnel to assess the geotechnical conditions at the Project area. The geotechnical investigation will include exploratory borings to investigate site-specific soils and conditions and to collect samples of subsurface soils for laboratory testing. Those soil samples will be tested to evaluate liquefaction potential, collapsibility potential, stability, and corrosion potential. The Project-specific findings and recommendations of the geotechnical investigation will be summarized in a Structure Foundation Report (SFR) and a Geotechnical Design Report (GDR) to be submitted to the California Department of Transportation (Caltrans) for review and approval. Those findings and recommendations will be incorporated in the final design of the selected Build Alternative.

2.10 Paleontology

2.10.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as part of federally authorized projects. 16 United States Codes (USC) 431–433 (the "Antiquities Act") prohibits appropriating, excavating, injuring, or destroying any object of antiquity situated of federal land without the permission of the Secretary of the Department of Government having jurisdiction over the land.

16 United States Code (USC) 470aaa (the Paleontological Resources Preservation Act) prohibits the excavation, removal, or damage of any paleontological resources located on federal land under the jurisdiction of the Secretaries of the Interior or Agriculture without first obtaining an appropriate permit. The statute establishes criminal and civil penalties for fossil theft and vandalism on federal lands.

23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by the California Environmental Quality Act (CEQA).

2.10.2 Affected Environment

This section is based on the *Paleontological Identification and Evaluation Report* (August 2010) and the *Addendum to the Paleontological Identification and Evaluation Report (*July 2011).

The Project area is within the northwestern Peninsular Ranges geomorphic province of Southern California and is near the northern end of the Perris Block in this province. The Perris Block extends southeast from the southern foot of the San Gabriel and San Bernardino Mountains to the vicinity of Bachelor Mountain and Poly Butte. The Perris Block is bounded on the southwest by the Elsinore Fault Zone and on the northeast by the San Jacinto Fault. The surface of the Perris Block consists of granitic exposures that have been tectonically tilted eastward, leaving granitic outcrops elevated and exposed on the west side of the Perris Block (Jurupa Hills) and allowing Pleistocene sediments to cover the east side, filling the eastern San

Bernardino, Moreno, Lakeview, and San Jacinto Valleys. The block tilted eastward prior to late Pleistocene time. The Santa Ana River, which is immediately north and west of the Project site, has incised the Perris Block from its northern margin to the Elsinore Fault Zone.

A paleontological literature review was conducted using unpublished reports, paleontological assessment and monitoring reports, field notes, and published literature. In addition, a paleontological resource locality search was conducted through the San Bernardino County Museum and the Natural History Museum of Los Angeles County. The purpose of the literature review and locality search was to locate previously documented fossil localities in the Project area and in western San Bernardino and Riverside Counties and to document the potential for paleontological resources older than 9,000 years to occur in the Project area.

Geologic mapping indicates that the Project area is located on early Pleistocene alluvium (Qvof, 1 million to 2 million years ago), middle Pleistocene alluvium (Qof, 250,000 to 1 million years ago), and young (Holocene, the last 9,000 years) alluvial sediments (Qf, Qyf), including recently active Holocene wash sediments (Qw).

Older Pleistocene alluvium (Qvof) sediments are exposed on the surface over most of the Project area, and sediments are well exposed in the railroad cuts along the western margins of the Project area. Middle Pleistocene sediments are mapped as having limited surface exposure within the Project area. Older and middle Pleistocene sediments have the potential to contain significant nonrenewable paleontological resources.

The results of the literature review indicate that the Project is underlain by Pleistocene alluvium with a high sensitivity for paleontological resources. The high sensitivity is based on the occurrence of numerous paleontological finds throughout San Bernardino and Riverside Counties, including mammoth, mastodon, giant ground sloth, dire wolf, saber-tooth cat, large and small horses, camels, and bison. There are no recorded paleontological localities in the Project area. However, there is a high potential for important vertebrate fossils to occur where Pleistocene sediments crop out at the surface in the San Bernardino Basin.

Vehicular and pedestrian surveys were conducted in the Project area. The vehicular survey was conducted on February 10, 2009. The pedestrian surveys were conducted on February 11 and April 20, 2009. The vehicular survey verified the results of the literature review, analysis of the geologic mapping, and the potential for preservation

of fossils in older Pleistocene alluvium (Qvof) along the study area. Due to heavy vegetation, no mid-Pleistocene alluvium (Qof) was visible where it had been mapped.

Good exposures of sediments were present at the west ends of De Berry and Van Buren Streets and along the deep cuts for the BNSF Railway and the Union Pacific Railroad (UPRR). The pedestrian surveys verified the presence of older Pleistocene alluvium (Qvof) in the Project area. Due to a thick cover of vegetation, no mid-Pleistocene alluvium (Qof) was observed in the Project area. No paleontological resources were found during the pedestrian surveys, although the older Pleistocene sediments are appropriate for the preservation of vertebrate fossils.

2.10.3 Environmental Consequences

2.10.3.1 Temporary Impacts

Alternatives 1, 3 and 6, and Modified Alternative 7 (Preferred Alternative)

Any impacts to paleontological resources would be considered permanent; therefore, an analysis of temporary impacts is not applicable.

2.10.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative would not result in ground disturbance or excavation; therefore, no impacts to paleontological resources would occur.

Separately, the Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will result in soil disturbance and excavation in the Project area. A Paleontological Mitigation Plan (PMP) has been developed for this project and is being implemented during construction. No impacts to paleontological resources will occur.

Alternatives 3 and 6, and Modified Alternative 7 (Preferred Alternative)

Construction of the Project would include grading and excavation. Excavation would cut through thin surficial soils and contact native older Pleistocene alluvial sediments. During these excavation activities, there is a potential for significant, nonrenewable paleontological resources to be encountered in the Pleistocene sediments where they crop out at the surface, as well as just below the surface. Ground disturbance would occur over approximately 40 acres (ac) for Alternative 3, approximately 33 ac for Alternative 6, and approximately 24 ac for Modified Alternative 7. Therefore,

Alternative 3 would have the greatest potential to encounter fossiliferous sediments during excavation.

The ramps for the Project would be on the embankment, requiring minimal excavation, but excavation for the structural footings would require excavation depths of 10 to 15 feet (ft). In areas requiring greater depths of excavation, the potential to encounter fossiliferous sediments would be greater; therefore, the potential for impacts to paleontological resources to occur in these areas would be higher.

To avoid impacts to any paleontological resources that may be present within the Project area where excavation may take place in areas of undisturbed soils, a PMP, as specified below in Measure PAL-1, would be implemented during construction.

2.10.4 Avoidance, Minimization, and/or Mitigation Measures

The measure below is required during construction of Alternatives 3 and 6, or Modified Alternative 7 to avoid impacts to paleontological resources.

PAL-1 **Paleontological Mitigation Plan.** During Plans, Specifications, and Estimates (PS&E), a Paleontological Mitigation Plan (PMP) will be prepared and adhered to during construction. The PMP will follow the guidelines of the California Department of Transportation (Caltrans) and the Society of Vertebrate Paleontologists (SVP). The PMP will include, but not be limited to, the following:

a. A preconstruction field survey, including salvage of any observed surface paleontological resources, prior to the beginning of grading.
b. Attendance at the pregrade meeting by a qualified paleontologist or his/her representative. At this meeting, the paleontologist will explain the likelihood for encountering paleontological resources, what resources may be discovered, and the methods that will be employed if paleontological resources are discovered.
c. During construction excavation, a qualified vertebrate paleontological monitor will initially be present on a full-time basis whenever excavation will occur within sediments that have a high sensitivity rating. Monitoring may be reduced to a part-time basis if no resources are being discovered in sediments with a high sensitivity rating (monitoring reductions and when they occur will be determined by the qualified Principal Paleontologist). The

monitor will inspect fresh cuts and/or spoils piles to recover paleontological resources. The monitor will be empowered to temporarily divert construction equipment away from the immediate area of a discovery. The monitor will be equipped to rapidly stabilize and remove fossils to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, Caltrans and the San Bernardino Association of Governments (SANBAG) will consider using heavy equipment to assist in the speedy and safe removal and collection of large materials.

d. Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, it is recommended that these native sediments occasionally be spot-tested by screening through $^{1}/_{20}$-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, sediment samples (up to 12 cubic yards, or 6,000 pounds) will be collected and processed through $^{1}/_{20}$-inch mesh screens to recover additional fossils.
e. Recovered specimens will be prepared to the point of identification and permanent preservation. This includes the sorting of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost, and the addition of approved chemical hardeners/ stabilizers to fragile specimens.
f. Specimens will be identified to the most specific taxonomic level possible and curated at an institutional repository with retrievable storage. Repository institutions usually charge a one-time fee based on the volume of material, so removing surplus sediment is important. The repository institution may be a local museum or university that has a curator who can retrieve the specimens on request. Caltrans and SVP require that a draft curation agreement be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.
g. A Final Report will be presented to Caltrans and the repository institution, describing all salvage activities, geology, and the paleontological resources recovered and their distribution.

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2.11 Hazardous Waste/Materials

2.11.1 Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

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

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

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

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean up

contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during Project construction.

2.11.2 Affected Environment

This section is based on the *Initial Site Assessments* (ISAs) prepared for Alternatives 3 and 6 (February 2010) and Modified Alternative 7 (November 2013), the *Aerially Deposited Lead Investigation Report* (ADL Investigation Report) (May 2010), the *Asbestos Containing Materials and Lead Based Paint Survey Report* (ACM and LBP Report) (September 2011), *Phase II Site Investigation Report, Agricultural Properties, La Crosse Avenue and De Berry Street* (February 2014a), *Phase II Site Investigation Report, Automotive FBR Generator/Pas Tex Plastics, 21823 and 21825 Barton Road* (February 2014b), *Phase II Site Investigation Report, Quick Stop, 22087 Barton Road* (February 2014c), *Phase II Site Investigation Report, A-1 Cleaners, 21900 Barton Road* (February 2014d), *Phase II Site Investigation Report Arco Station, 22115 Barton Road* (February 2014e), and *Phase II Site Investigation Report, Shell Station, 22045 Barton Road* (February 2014f). The study area included the Project footprint and adjacent areas that had the potential to impact the Project site. The following were conducted as part of the ISAs, ADL Investigation Report, and the ACM and LBP Report:

- Environmental Database Review: A records search of federal and State environmental databases for the study area and properties up to approximately 0.5 mile (mi) from the Project site was conducted in June 2013. However, the search of the National Priority List (NPL) was for a 1 mi radius.
- Agency Records Review: The South Coast Air Quality Management District (SCAQMD); the San Bernardino County Fire Department (SBCFD), Hazardous Materials Division; the Santa Ana Regional Water Quality Control Board (RWQCB); the State of California, Office of the State Fire Marshall, Pipeline Safety Division; and the San Bernardino County Office of the Assessors, Building and Permitting Department, were contacted with regard to obtaining and reviewing documents for properties located within and adjacent to the Project

footprint. Data contained on RWQCB and SCAQMD websites were also reviewed for any relevant information.

- Historical Research: Aerial photographs, Sanborn Fire Insurance Maps, historical topographic maps, and city directories were reviewed.
- Site Reconnaissance: On March 9, 2009; June 15, 2011; and June 28, 2013, site visits of the study area were conducted to assess its current land uses and to visually search for indications of contamination.

The following hazardous materials are potentially of concern for the study area:

- Polychlorinated Biphenyls: Multiple pad-mounted transformers and pole-mounted transformers were observed on adjacent commercial properties and along Barton Road, Commerce Way, Michigan Avenue, De Berry Street, and La Crosse Avenue. The transformers appeared to be in good condition, with no visible leaks and no soil staining. However, there is the potential for the transformers to contain polychlorinated biphenyls (PCBs).
- Creosote. There is a potential that the wood utility poles in the study area were treated with creosote.
- Aerially-Deposited Lead: Lead is generally encountered in unpaved areas (or formerly unpaved areas) adjoining older roads, primarily as a result of deposition from historical vehicle emissions. Roadways in the location of both Barton Road and Interstate 215 (I-215) (Historic United States [U.S.] Routes 91 and 395) have been used since approximately 1930 and 1966, respectively, resulting in the exposure of the adjacent unpaved surficial soils to aerially-deposited lead (ADL). Therefore, an ADL Investigation Report was prepared to evaluate lead concentrations in the subsurface soil profile within the construction zone.

  The ADL survey work was limited to the existing right-of-way along the unpaved shoulders and medians of the I-215/Barton Road interchange. A total of 66 soil samples were collected at depths ranging from 0.5 to 3.0 feet (ft) below ground surface (bgs). Per the statewide variance issued to the California Department of Transportation (Caltrans) by the Department of Toxic Substances Control (DTSC) (July 1, 2009), which regulates the handling of lead-containing soil, soil with less than 1,411 milligrams per kilogram (mg/kg) of total lead or less than 1.5 milligrams per liter (mg/L) of soluble lead can be reused within Caltrans right-of-way if it is placed at least 5 ft above the groundwater level and covered by 1 ft of clean soil. The DTSC allows lead-containing soil with less than 3,397 mg/kg of total lead or 150 mg/L soluble lead to be reused within the Caltrans right-of-way,

provided it is placed a minimum of 5 ft above the maximum water table and is covered by pavement. In addition, soil with a hydrogen ion index (pH) less than 5.5 but greater than 5.0 may only be used as fill under paved roads. Soils with a pH less than 5.0 shall be managed as hazardous waste. As described below, ADL is present in near-surface soils within the study area; however, lead concentrations were below established regulatory limits.

Total lead concentrations in the samples ranged from less than 1.0 mg/kg to 340 mg/kg, with a mean concentration of 19 mg/kg (United States Environmental Protection Agency [EPA] test method 6010B). Total lead concentrations did not exceed the Total Threshold Limit Concentration (California hazardous waste) of 1,000 mg/L.

Eleven soil samples exceeding a total lead concentration of 25 mg/kg were analyzed for soluble lead (Cal WET method). Soluble lead concentrations ranged from less than 0.20 to 17 mg/L, with a mean concentration of 1.4 mg/L. Two samples exceeded the Soluble Threshold Limit Concentration (California hazardous waste) of 5 mg/L.

The two soil samples with soluble lead concentrations exceeding the 5 mg/L were analyzed for Toxicity Characteristic Leaching Procedure (TCLP). TCLP lead concentrations ranged from 0.02 to 0.14 mg/L and did not exceed the TCLP (RCRA hazardous waste) limit of 5 mg/L.

Six samples were analyzed for soluble lead using the Cal WET-DI test. Soluble lead concentrations were less than 0.20 mg/L.

Based on the ADL survey, soil may be managed as nonhazardous or reused on site without restrictions.

- Lead Chromate: Yellow traffic markings (thermoplastic and paint) located on I-215, Barton Road, and ancillary roads associated with the study area potentially contain hazardous levels of lead chromate.
- Lead-Based Paint: It is possible for lead-based paint (LBP) to be present in buildings and structures. No LBP was found in samples taken from the Barton Road overcrossing.
- Asbestos-Containing Materials: The potential exists for buried asbestos containing cementitious pipe (“transite”) to be present within the study area. Cementitious pipe was commonly used for water transportation as part of historical agricultural practices. In addition, it is possible for asbestos-containing

materials (ACM) to be present in buildings and structures within the study area. No ACM was found in accessible materials on the Barton Road overcrossing.

- Pesticides: Based on the historical agricultural use of the study area, persistent pesticides had the potential to remain in soils in the study area. In addition, persistent pesticides may remain in soil along and adjacent to railroad tracks. Soil excavation is currently ongoing along I-215 within the Project area as part of the I-215 Bi-County HOV Gap Closure Project (EA#: 0M940). As discussed in Section 4.11.3.1, below, soil sampling determined that contaminants of concern are present in soils at the agricultural properties, but at concentrations below human health screening levels, and no further assessment is required.
- Petroleum Hydrocarbons and Metals: The potential exists for hydrocarbons and metals to be present in soil along or adjacent to railroad tracks. Sampling was performed in March 2009 along I-215 in the vicinity of the BNSF and Union Pacific Railroad (UPRR) railroad track bridges as part of the I-215 Bi-County HOV Lane Gap Closure Project (EA#: 0M940). Although not analyzed for petroleum hydrocarbons, soil samples collected near the bridges were analyzed for metals, semi-volatile organic compounds (SVOCs), and PCBs. One sample collected near the UPRR bridge contained an elevated lead concentration in a shallow soil sample. However, further analysis of that sample indicated the lead concentration detected was not indicative of a California hazardous waste. Elevated concentrations of arsenic were detected in soil near the BNSF Railway bridge. It was concluded that unless a variance could be obtained to allow replacement of the soil within the railroad area, it was recommended that excavated soil along the railroad tracks be disposed off-site as nonhazardous waste. SVOCs and PCBs were not detected in the samples collected near either railway bridge structure. Soil near the railway bridges will be handled as part of the Bi-County HOV Widening Project (EA#: 0M940), which is currently under construction.

  Six leaking underground storage tanks (LUSTs), identified as Quik Stop ARCO and Mobil Station #92 (both at 22087 Barton Road), Former Shell Station and Texaco Service Station (both at 22045 Barton Road), and Grand Terrace Gas-Up #2603 and Jerry's Auto Service (both at 22115 Barton Road) are located in the Project area, which may have impacted soils and groundwater. In addition, a 1,000-gallon Underground Storage Tank (UST) was reported at 21801 Barton Road, which is in the Project area. Various facilities are listed at this location. Although the property is not listed in the LUST database, it was listed in the

environmental database report as having a release of oil in 2005. The facility was also listed as having an ongoing problem with the tank overflowing, evidenced by spill marks on the tank and on the ground below the tank. At least one-third of the property had problems due to the contamination. In addition, oil was reportedly washed off equipment to dirt areas on site. As discussed in Section 4.11.3.1, below, soil sampling determined that contaminants of concern are present in soils at the sites, but at concentrations below human health screening levels, and no further assessment is required.

- Halogenated Compounds: A1 Cleaners, located at 21900 Barton Road (Suite 130) within the Project limits is anticipated to be fully acquired under all Build Alternatives for the Project. This facility is listed in the environmental database report as having disposed of halogenated compounds, one liquid with halogenated organic compounds greater than 1,000 mg/L, and aqueous solution with total organic residues less than 10 percent. In addition, SCAQMD records indicate that this facility operated dry cleaning equipment containing perchloroethylene (PCE) in 2005, 2006, and 2008. Information in SBCFD records indicates that this facility was burned down. No releases were reported for this facility. However, as described in Section 2.11.3.1, below, soil sampling conducted at this site has determined that subsurface soils are contaminated with PCE and further action is required.

  The top portion of a 55-gallon drum was observed on a vacant property located west of the I-215 southbound on-ramp and south of Barton Road. The contents in the partial, or partially buried, drum were unknown.

Table 2.11.A shows properties within the Project Area and the hazardous waste concerns on those properties that could potentially affect the Project identified in the ISAs. The locations of the sites of concern identified in the ISAs are shown on Figures 2.11.1, 2.11.2, and 2.11.3, for Alternatives 3, 6, and Modified Alternative 7, respectively.

2.11.3 Environmental Consequences

2.11.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative would not involve ground and structure disturbance or construction activities in the Project area; therefore, no temporary impacts related to hazardous waste/materials would occur.

Table 2.11.A Sites of Concern for the Build Alternatives

Figure ID[1]	Address	Facility Name	Potential Hazardous Waste	Alt 3	Alt 6	Modified Alt 7 (Preferred Alternative)
1	22087 Barton Road, Grand Terrace	Quik Stop ARCO and Mobil Station #92	Gasoline LUST. Remediation is ongoing at this site. Dissolved petroleum hydrocarbon constituents, including total petroleum hydrocarbons as gasoline (TPHg), gasoline constituents (benzene, toluene, ethylbenzene and xylenes [BTEX]), methyl tertiary buytl ether (MTBE), and other fuel oxygenates were not detected in four groundwater monitoring wells sampled on May 13, 2011. Based on results of the rebound test, the average concentrations of petroleum hydrocarbon constituents were significantly less than the concentrations detected prior to restarting continuous operation of the soil vapor extraction (SVE) system. Termination of SVE operation and preparation of a work plan for confirmation soil sampling was recommended on January 28, 2012. On April 5, 2012, the Santa Ana Regional Water Quality Control Board (SARWQCB) issued a letter indicating its approval of performing confirmatory soil sampling and indicating that it will comply with the SARWQCB's request to drill three confirmation soil borings instead of two borings. Potential hazardous wastes included: petroleum hydrocarbons, volatile organic compounds, including fuel oxygenates, and metals. The PSI conducted for this site determined that no further assessment was necessary.	X	X	X
2 and 3	22045 Barton Road, Grand Terrace	Former Shell Station and Texaco Service Station	Gasoline LUST. SARWQCB confirms the completion of site investigation and remedial action. Although the case was closed as of December 17, 1996, residual petroleum hydrocarbons may remain in soil at this property. Case closure documentation indicates that if land use changes, a review of the corrective actions may be warranted if on-site excavation or construction activities expose contaminated soil or groundwater, or if the land use changes are such that the residual contamination at the site could pose a risk to site occupants. Potential hazardous wastes included: petroleum hydrocarbons, volatile organic compounds, including fuel oxygenates, and metals. The PSI conducted for this site determined that no further assessment was necessary.	X	X	X

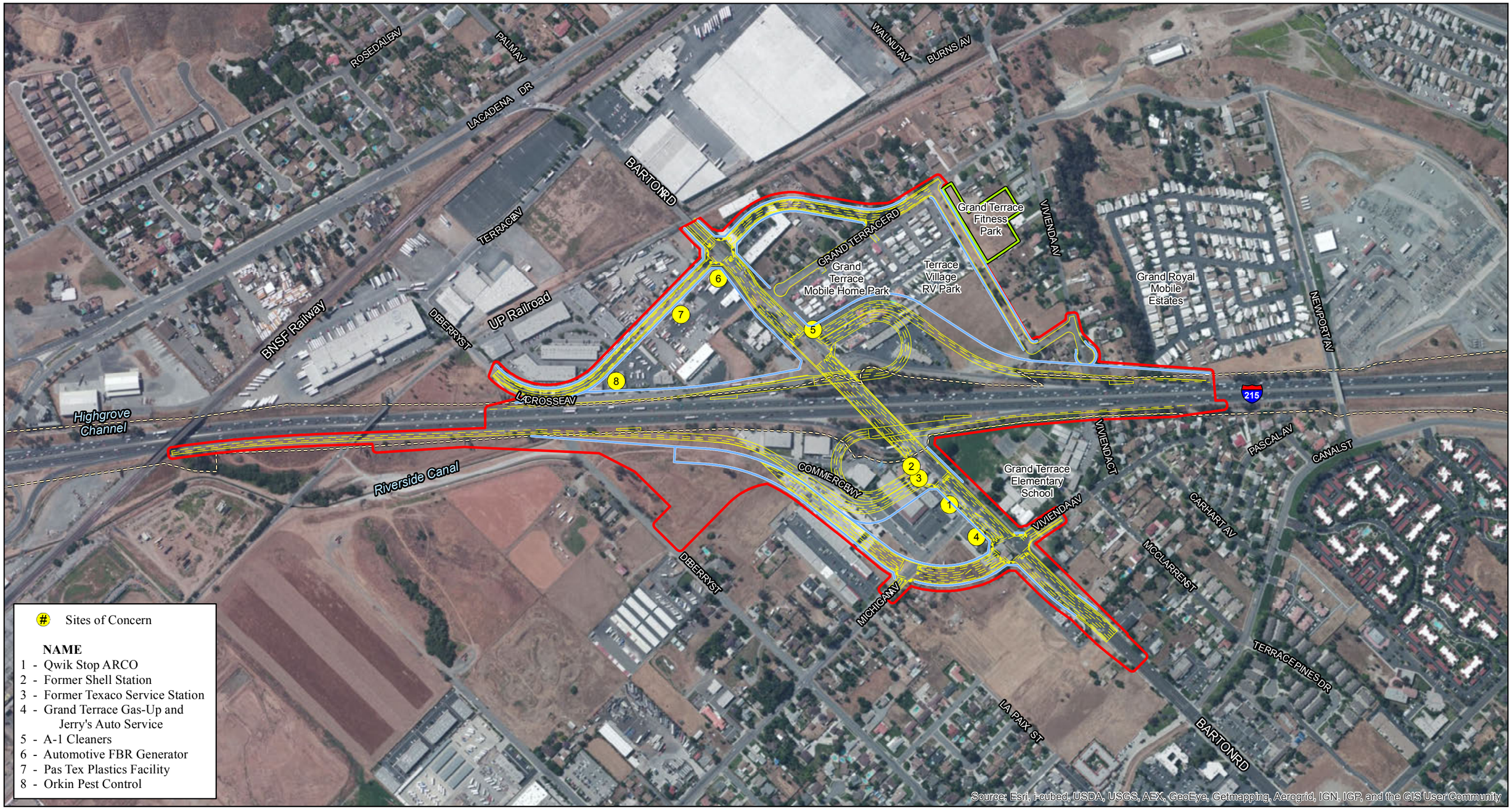
Table 2.11.A Sites of Concern for the Build Alternatives (Continued)

Figure ID[1]	Address	Facility Name	Potential Hazardous Waste	Alt 3	Alt 6	Modified Alt 7 (Preferred Alternative)
4	22115 Barton Road, Grand Terrace	Grand Terrace Gas-Up and Jerry's Auto Service	UST and LUST Case Closure. Although case closure has been granted, potential residual hydrocarbons present in soils at this facility may negatively affect environmental conditions at the site. Potential hazardous wastes included: petroleum hydrocarbons, volatile organic compounds, including fuel oxygenates, and metals. The PSI conducted for this site determined that no further assessment was necessary.	X	X	X
5	21900 Barton Road, Grand Terrace	A1 Cleaners	Use of Dry Cleaning Solvents. Potential residual solvents; facility reportedly destroyed in fire. No releases were reported for this facility. However, because this facility is located on a parcel that will be fully acquired, this facility may have negatively affected environmental conditions at the site. Potential hazardous wastes included: volatile organic compounds, including PCE and other chlorinated solvents. The PSI conducted for this site determined that this site is contaminated with PCE and that additional sampling and remediation is necessary.	X	X	X
6	21823 Barton Road, Grand Terrace	Automotive FBR Generator	May have used or stored hazardous materials/ wastes. Potential hazardous wastes included: petroleum hydrocarbons, volatile organic compounds, including fuel oxygenates, and metals. The PSI conducted for this site determined that no further assessment was necessary.	X	X	X
7	21825 Barton Road, Grand Terrace	Pas Tex Plastics Facility	May have used or stored hazardous materials/ wastes. Potential hazardous wastes included: petroleum hydrocarbons, volatile organic compounds, including fuel oxygenates, and metals. The PSI conducted for this site determined that no further assessment was necessary.	X	X	X
8	2233 La Crosse Avenue, Colton	Orkin Pest Control	Pesticide storage. No releases were reported for this facility. This property is a potential acquisition. It is possible that undocumented releases may have occurred.	X		

Sources: *Initial Site Assessment* (February 2010); *Initial Site Assessment for Modified Alternative 7* (November 2013).

[1] The locations of these properties are shown on Figures 2.11.1, 2.11.2, and 2.11.3 for Alternatives 3 and 6, and Modified Alternative 7, respectively.

Alt = Alternative



Sites of Concern

NAME

1 - Qwik Stop ARCO
2 - Former Shell Station
3 - Former Texaco Service Station
4 - Grand Terrace Gas-Up and Jerry's Auto Service
5 - A-1 Cleaners
6 - Automotive FBR Generator
7 - Pas Tex Plastics Facility
8 - Orkin Pest Control

LEGEND

- Project Area
- Existing Caltrans Right of Way
- Grand Terrace Fitness Park
- Alternative 3
- Alternative 3 Proposed Right of Way

0 250 500
FEET

SOURCE: Microsoft (5/2010); AECOM (8/2013)

I:\SBA330\Barton_I-215\GIS\ISEA\HazSites_Alt3.mxd (11/5/2013)

FIGURE 2.11.1

I-215/Barton Road Interchange Improvement Project

Sites of Concern for Alternative 3

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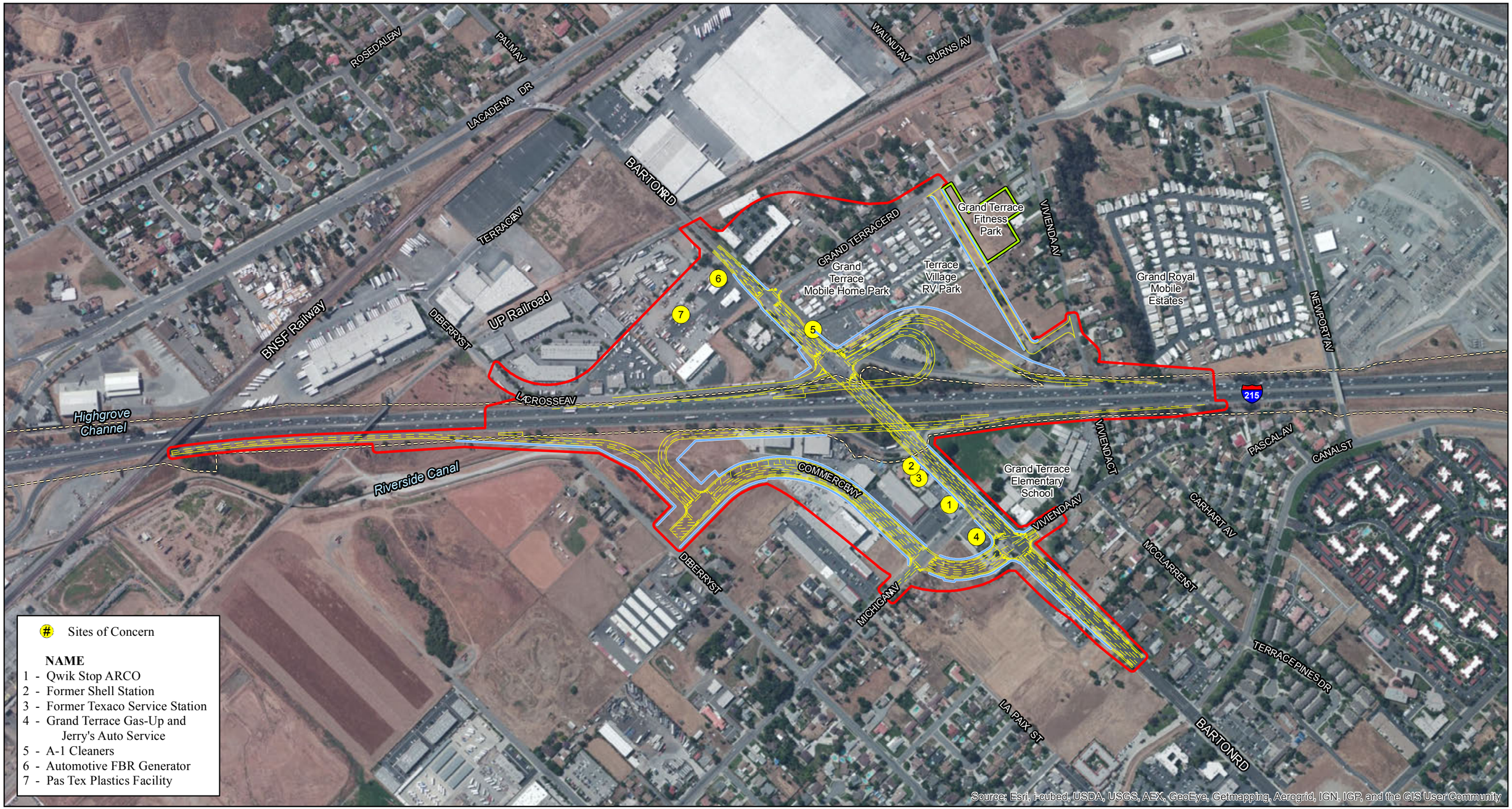

LEGEND

- Project Area
- Existing Caltrans Right of Way
- Grand Terrace Fitness Park
- Alternative 6
- Alternative 6 Proposed Right of Way

0 250 500
FEET

SOURCE: Microsoft (5/2010); AECOM (8/2013)

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FIGURE 2.11.2

I-215/Barton Road Interchange Improvement Project

Sites of Concern for Alternative 6

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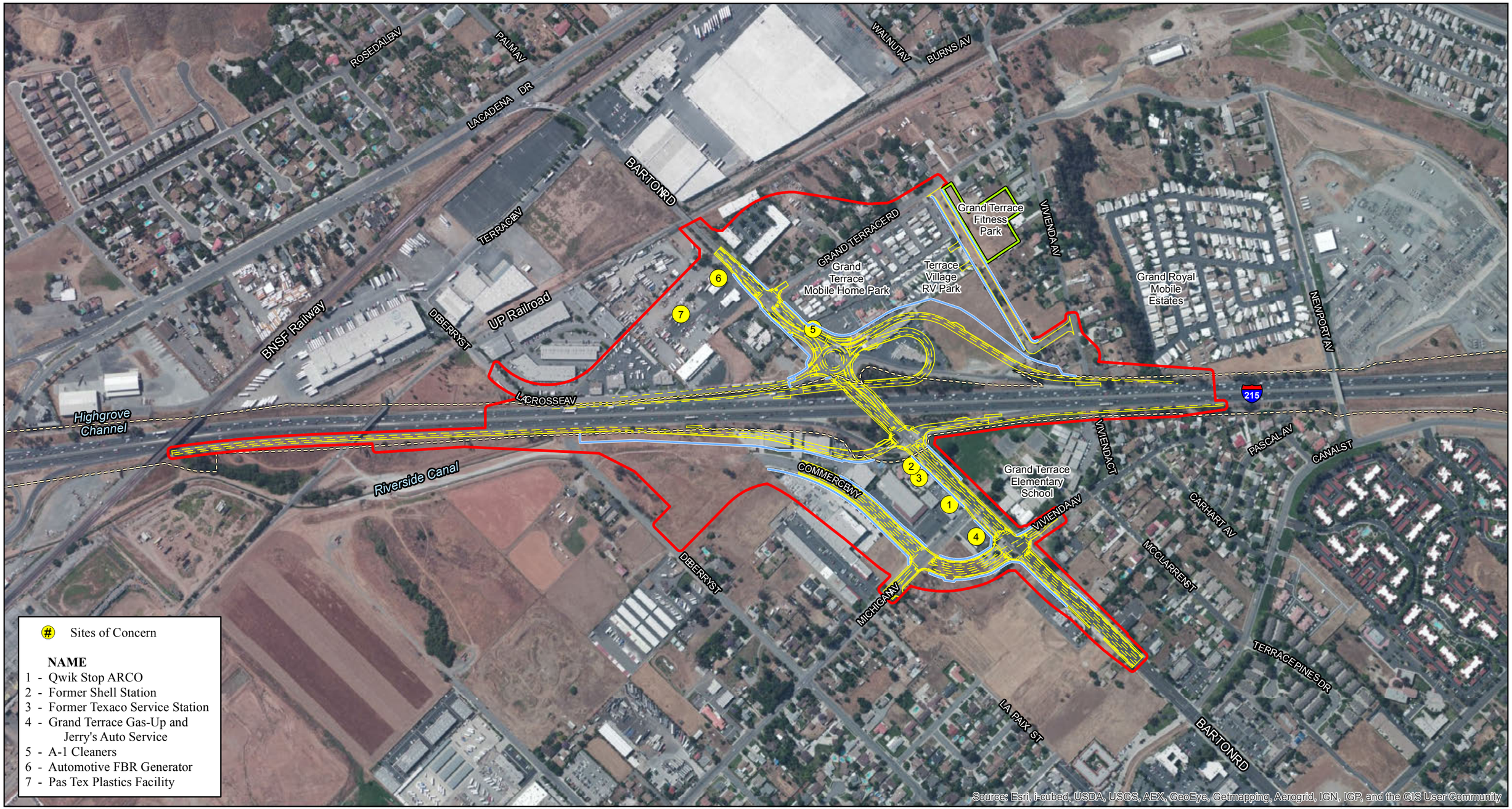

LEGEND

- Project Area
- Existing Caltrans Right of Way
- Grand Terrace Fitness Park
- Modified Alternative 7
- Modified Alternative 7 Proposed Right of Way

0 250 500
FEET

SOURCE: Microsoft (5/2010); AECOM (8/2013)

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FIGURE 2.11.3

I-215/Barton Road Interchange Improvement Project

Sites of Concern for Modified Alternative 7 (Preferred Alternative)

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Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The Project would involve disturbance of soils and demolition of existing buildings and structures; therefore, hazardous structural materials (PCBs, lead chromate, LBP, and ACM) may be encountered during Project construction. In addition, there was the potential for soil impacted by petroleum hydrocarbons, halogenated compounds, or other hazardous materials to be encountered at the properties listed in Table 2.11.A. Persistent pesticides may remain in undeveloped areas of historical pesticide use, if the surface soils have not been previously disturbed. To further determine if the six properties which could be potentially impacted by any of the studied Build Alternatives identified in Table 2.11.A could have hazardous waste concerns necessitating special handling of soils or other measures, as well as to meet the requirements of Measures HAZ-1, HAZ-9, and HAZ-12, PSIs were conducted in November 2013 through January 2014.

Soil sampling was conducted at the properties listed below and separate PSI reports were prepared for each property. The results of the PSI performed for each of the six properties is summarized below. As detailed below, the PSI reports determined that no further investigation was warranted at any of the sites except for the property located at 21900 Barton Road.

- **Agricultural Properties (La Crosse Avenue and De Berry Street):** Five soil borings were advanced to a depth of 5 ft below ground surface (bgs) on December 5, 2013. Soil samples were collected and analyzed for arsenic, chlorinated herbicides, organophosphate pesticides, and organochlorine pesticides. No chlorinated herbicides or organophosphate pesticides were detected in the soil samples.

  Arsenic was detected in 11 soil samples. Arsenic in all but two of the soil samples was detected at concentrations greater than the California Environmental Protection Agency California Human Health Screening Levels (CHHSLs) (one from De Berry Street and one from La Crosse Avenue). All detected arsenic concentrations were greater than the EPA regional screening levels (RSLs) Industrial Scenario. However, background concentrations of arsenic in California are often higher than the RSL. A commonly accepted background concentration for arsenic in southern California is 12 mg/kg. The highest arsenic concentration detected at the site was 3.7 mg/kg, which is below the regional background level.

  One organophosphate pesticide, 4,4'-Dichlorodiphenyldichloroethylene (4,4'-DDE), was detected at a concentration of 0.0019 mg/kg in the surface

sample collected from one of the De Berry Street borings. The RSL for 4,4'-DDE is 5.1 mg/kg and the CHHSL for DDE is 6.3 mg/kg. Both screening levels are orders of magnitude higher than the single detected concentration.

Although contaminants of concern (arsenic and organophosphate pesticides) are present in soils at the sites, they are at concentrations below human health screening levels. Therefore, further assessment is not required.

- **Automotive FBR Generator/Pas Tex Plastics (21823 and 21825 Barton Road):** Two soil borings were advanced to a depth of 10 ft bgs on November 6 and 7, 2013. Soil samples were collected and analyzed for metals, volatile organic compounds (VOCs), and total petroleum hydrocarbons.

  Tetrachloroethene, also known as PCE (a VOC), was detected in six soil samples collected at the site. The maximum detected concentration of PCE was 160 micrograms per kilogram (µg/kg). The residential RSL for PCE is 22,000 µg/kg, which is several orders of magnitude greater than the highest detected concentration in soil.

  Low concentrations of total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil were detected in shallow soil samples collected at the site. RSLs do not exist for total petroleum hydrocarbons, and the Santa Ana Regional Water Quality Control Board (RWQCB) does not have screening levels, but the Los Angeles RWQCB has established screening levels for total petroleum hydrocarbons for the protection of groundwater. For soils 20 to 150 ft above groundwater, the maximum screening levels for total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil are 1,000 and 10,000 mg/kg, respectively. The highest detected concentrations of total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil at the site were 8.3 mg/kg and 62 mg/kg, respectively, both below the RWQCB screening level.

  With the exception of arsenic, all detected concentrations of metals were below both the CHHSLs and RSLs. The maximum detected concentration of arsenic was 3.7 mg/kg, which is below the commonly accepted background concentration for arsenic in southern California of 12 mg/kg.

  Although contaminants of concern (volatile organic carbon, metals, and total petroleum hydrocarbons) are present in soils at the sites, they are at concentrations below human health screening levels. Therefore, further assessment is not required.

- **Shell Station (22045 Barton Road):** Three soil borings were advanced to a depth of 10 ft bgs on November 6, 2013. Soil samples were collected and analyzed for metals, VOCs, and total petroleum hydrocarbons. VOCs were not detected in the soil samples.

  Low concentrations of total petroleum hydrocarbons as motor oil were detected in shallow soil samples collected at the site. The highest detected concentration of total petroleum hydrocarbons as motor oil at the site was 330 mg/kg, which is below the RWQCB screening level of 10,000 mg/kg.

  With the exception of arsenic, all detected concentrations of metals were below both the CHHSLs and RSLs. The maximum detected concentration of arsenic was 5.4 mg/kg, which is below the commonly accepted background concentration for arsenic in southern California of 12 mg/kg.

  Although contaminants of concern (metals and total petroleum hydrocarbons) are present in soils at the sites, they are at concentrations below human health screening levels. Therefore, further assessment is not required.

- **Quick Stop (22087 Barton Road):** Four soil borings were advanced to a depth of 10 ft bgs on November 6 and 7, 2013. Soil samples were collected and analyzed for metals, VOCs, and total petroleum hydrocarbons.

  Two VOCs (benzene and toluene) were detected in soil samples from the site. Benzene was detected at a depth of 10 ft bgs in two samples between the practical quantitation limits and method detection limits (up to 0.0033 mg/kg). Toluene was detected at a depth of 10 ft bgs in one sample, at an estimated concentration of 0.0018 mg/kg. The detected concentrations were below the industrial RSLs of 5.4 mg/kg for benzene and 4,500 mg/kg for toluene.

  Low concentrations of total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil were detected in shallow soil samples collected at the site. The highest detected concentrations of total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil at the site were 15 mg/kg and 100 mg/kg, respectively, both below the RWQCB screening levels of 1,000 mg/kg and 10,000 mg/kg.

  With the exception of arsenic, all detected concentrations of metals were below both the CHHSLs and RSLs. The maximum detected concentration of arsenic was 4.8 mg/kg, which is below the commonly accepted background concentration for arsenic in southern California of 12 mg/kg.

Although contaminants of concern (volatile organic carbon, metals, and total petroleum hydrocarbons) are present in soils at the sites, they are at concentrations below human health screening levels. Therefore, further assessment is not required.

- **Arco Station (22115 Barton Road):** Four soil borings were advanced to a depth of 10 ft bgs on November 6 and 7, 2013. Soil samples were collected and analyzed for metals, VOCs, and total petroleum hydrocarbons. VOCs were not detected in the soil samples.

  Low concentrations of total petroleum hydrocarbons as motor oil were detected in shallow soil samples collected at the site. The highest detected concentration of total petroleum hydrocarbons as motor oil at the site was 58 mg/kg, which is below the RWQCB screening level of 10,000 mg/kg.

  With the exception of arsenic, all detected concentrations of metals were below both the CHHSLs and RSLs. The maximum detected concentration of arsenic was 3.6 mg/kg, which is below the commonly accepted background concentration for arsenic in southern California of 12 mg/kg.

  Although contaminants of concern (metals and total petroleum hydrocarbons) are present in soils at the site, they are at concentrations below human health screening levels. Therefore, further assessment is not required.

- **A-1 Cleaners (21900 Barton Road):** Seven soil borings were advanced to a depth of 30 ft bgs on November 6 and 7, 2013. Soil samples were collected and analyzed for metals, VOCs, and total petroleum hydrocarbons. An additional 13 soil borings were advanced to a depth of 90 ft bgs on December 10 to 16, 2013. Five of the 13 additional soil boring locations were located adjacent to the previous boring locations. Soil samples were collected and analyzed for metals, VOCs, and total petroleum hydrocarbons. All soil borings were converted to dual-nested soil vapor probe wells. A total of 74 soil vapor monitoring points were installed at the 15 boring locations. Soil gas sampling was conducted November 18 and December 18 to 20, 2013.

  Two VOCs (PCE and tertbutyl alcohol) were detected in soil samples from the site. PCE was the most frequently detected, with concentrations up to 220 µg/kg, which is several orders of magnitude lower than the residential RSL of 22,000 µg/kg. Tertbutyl alcohol was detected at concentrations up to 27 µg/kg. There is no RSL for tertbutyl alcohol.

Low concentrations of total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil were detected in shallow soil samples collected at the site. With the exception of one location, total petroleum hydrocarbons were not detected in samples deeper than 10 ft bgs. The highest detected concentrations of total petroleum hydrocarbons as diesel and total petroleum hydrocarbons as motor oil at the site were 18 mg/kg and 240 mg/kg, respectively, both below the RWQCB screening levels of 1,000 mg/kg and 10,000 mg/kg.

With the exception of arsenic, all detected concentrations of metals were below both the CHHSLs and RSLs. The maximum detected concentration of arsenic was 3.8 mg/kg, which is below the commonly accepted background concentration for arsenic in southern California of 12 mg/kg.

Five VOCs (chloroform, trichloroethene, toluene, PCE, and 4-isopropyltoluene) were detected in soil gas samples. The most commonly detected VOC in the soil gas samples was PCE, with detected concentrations up to 2,060 µg/L, which is above the commercial/industrial CHHSL of 0.6 µg/L. Toluene and trichloroethene were detected at concentrations below their respective CHHSLs. CHHSLs have not been established for chloroform and 4-isopropyltoluene.

Although metals and total petroleum hydrocarbons are present in soils at the site, they are at concentrations below human health screening levels. Therefore, further assessment for metals and total petroleum hydrocarbons is not required. As discussed later in this section, the VOC contamination on the site will be remediated prior to construction of the project.

The recommendations from the PSI prepared for 21900 Barton Road are summarized below:

- A Notice of Unauthorized Release will be submitted to the regulatory agency, as applicable. Typically, either the property owner or responsible party (i.e., party responsible for a release) is responsible for submitting the notice.
- Assembly Bill No. 440 will be reviewed as a self-implementing alternative to conduct assessment and remediation.
- A Supplemental Site Investigation (SSI) Workplan will be developed to refine the lateral and vertical extent of volatile organic compounds (VOCs) [specifically PCE] in soil vapor and potentially groundwater. The SSI scope of work is expected to include:

  - One additional soil vapor sampling location near 21900-15.
  - Additional soil vapor probes should be installed at 10 foot intervals to 10 feet above groundwater.
  - Additional soil vapor locations offsite to the west, south and east of the property.
  - Install three groundwater monitoring wells, one in the vicinity of the former Dry Cleaners and two additional locations to establish groundwater gradient.
  - Conduct groundwater monitoring in newly installed groundwater monitoring wells.
- The responsible party may engage in a voluntary oversight program cleanup with either the DTSC or RWQCB.
- Based on the concentrations of PCE detected in soil vapor, remediation to reduce the concentrations of PCE in soil vapor will be conducted as required. A suitable remedial technology such as soil vapor extraction (SVE) is readily available and implementable. SVE can be very effective in rapidly reducing VOC concentrations in soil vapors at sites with coarse grained soil, such as this because coarse grained soil typically has high permeability, which allows vapor to be readily pulled from one area to another. In addition to the SSI Workplan, a SVE Pilot Test Workplan will be developed in conjunction with the SSI Workplan. The SVE Pilot Test Workplan is expected to include at a minimum;
  - A temporary SVE unit equipped with a South Coast Air Quality Management District (SCAQMD) 1166 Various Locations Permit,
  - SVE extraction wells located in the vicinity of the former A1 Dry Cleaner Building, and western, southern and eastern property boundary, and
  - SVE monitoring points for evaluating the radius of influence of the SVE system and the concentration of soil vapor in the soil.
- Results of the SSI and SVE Pilot Test will be evaluated to determine if additional assessment is necessary and to design a full scale SVE system or recommend alternate remedial alternatives.

Because the oversight regulatory agency has not been identified at this time, the schedule for further assessment and remediation of this site has not been established. However, it is anticipated that the SSI Workplan would be approved by the regulatory agency by July 2014 and that sampling would be conducted in July-August 2014. SVE Pilot Test Workplan is anticipated to be approved by the

regulatory agency by November 2014 and testing should commence in December 2014. Approval of the Remediation Plan is anticipated by April 2015. Remediation of the site is expected to take two to three months and is anticipated to be completed by July 2015. Although the extent of sampling work and remediation is not known at this time, costs for additional sampling, testing, and remediation is currently estimated to be approximately $500,000 to $1,000,000.

The Barton Road Overcrossing was tested for asbestos and LBP, and none was detected. There is no planned soil disturbance in the vicinity of the BNSF Railway tracks. It is possible for asbestos and LBP to be present in buildings and structures located on parcels that may need to be acquired as a result of the Project. These structures would require a survey and/or testing prior to demolition so that they can be removed and disposed of in accordance with applicable State and federal regulations.

Based on the ADL survey, soil may be managed as nonhazardous for lead or reused on site without restrictions.

Typical hazardous materials used during construction (e.g., solvents, paints, and fuels) would be handled in accordance with standard procedures. There are standard regulations and Caltrans policies (avoidance and minimization measures) that must be followed with respect to the use, storage, handling, disposal, and transport of potentially hazardous materials during construction of the Project to protect human health and the environment.

Measures HAZ-1 through HAZ-12, listed in Section 2.11.4 below, include performance of further testing and would require proper handling and disposal of hazardous waste and materials in accordance with local, State, and federal regulations, prior to and during construction of the Project as applicable. Measures HAZ-13 through HAZ-16 have been incorporated to require remediation of the VOC contamination at 21900 Barton Road (former A-1 Cleaners) prior to grading. With implementation of these measures, all potential impacts related to hazardous materials are expected to be addressed.

2.11.3.2 Permanent Impacts

Alternatives 1, 3, 6, and Modified Alternative 7 (Preferred Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Similar to the Build Alternatives, routine maintenance activities would continue under the No Build Alternative, including compliance with

applicable regulations regarding the handling and disposal of potentially hazardous materials.

Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. Use and disposal of hazardous materials for maintenance activities would be subject to Caltrans standards and other federal and State regulations.

2.11.4 Avoidance, Minimization, and/or Mitigation Measures

The measures below are required for Alternatives 3, 6, and Modified Alternative 7 to avoid and/or minimize potential impacts related to hazardous waste or materials.

Measures HAZ-1, HAZ-9, and HAZ-12 were completed as part of the PSIs conducted in November 2013 through January 2014. As recommended by the PSIs, measures HAZ-13 through HAZ-16 have been incorporated below to minimize potential impacts from the VOC contamination at 21900 Barton Road (former A-1 Cleaners).

HAZ-1 **Historic Agricultural Properties.** Prior to completion of the Project Approval/Environmental Document (PA/ED) phase, soil sampling for pesticides will be conducted in areas of historic agricultural use that have not previously been disturbed by the excavation activities associated with the ongoing I-215 Bi-County HOV Lane Gap Closure Project (EA#: 0M940). If these areas will be disturbed by the Project (through grading, etc.), soil samples should be analyzed for organochlorine pesticides (OCPs) using United States Environmental Protection Agency (EPA) Methods 8081. The analytical results of the soil sampling will be used to determine the appropriate handling, removal, containment, and off-site transportation and disposal of any contaminated soils, as appropriate. Testing on undisturbed historical or current agricultural areas is ongoing.

HAZ-2 **Striping and Pavement Markings.** Striping paint along Interstate 215 (I-215)/Barton Road and ancillary roads in the Project area will be sampled and tested for lead chromate by trained and/or licensed professionals in areas not already tested and remediated as part of the I-215 Bi-County HOV Lane Gap Closure Project. The field and analytical data obtained during this study will be used to provide a review of the sampling locations and descriptions, a summary of the

analytical results, and recommendations for striping paint removal, containment, and off-site transportation and disposal, as appropriate.

HAZ-3 **Transformers.** If transformer removal is required, Southern California Edison will be contacted prior to handling or removal of electric transformers. Should utility poles require removal, additional sampling and analysis will be conducted to determine the presence of creosote (often associated with the preservation of wooden electric poles) and appropriate disposal methods. Any hazardous transformers or poles that are disturbed/removed will be disposed of in accordance with the California Health and Safety Code.

HAZ-4 **Lead Compliance Plan.** Prior to construction, construction contractors excavating, transporting, or stockpiling soil will prepare a Lead Compliance Plan in accordance with the California Department of Transportation (Caltrans) Code of Safety Practices, the California Code of Regulations, and California Division of Occupational Safety and Health (Cal-OSHA) standards. The Lead Compliance Plan will address the presence of aerially deposited lead (ADL) in the soils within the Project area and the health and safety of construction workers.

HAZ-5 **Aerially-Deposited Lead Investigation Report.** Prior to construction, the testing results of the ADL Investigation Report will be provided to the construction contractor handling on-site soils during construction.

HAZ-6 **Transite Piping.** During construction, if signs of transite piping are observed, construction in the area will be halted and sampling and analysis for asbestos conducted. The analytical results of the soil sampling will be used to determine the appropriate handling, removal, containment, and off-site transportation and disposal of asbestos-containing transite piping, as appropriate.

HAZ-7 **Asbestos-Containing Materials and Lead-Based Paint.** After property acquisition and prior to demolition, building structures planned for demolition within the Project area will be assessed for the possible presence of ACM and LBP. These studies will be conducted by trained and/or licensed professionals and will comply with the EPA, National Emission Standards for Hazardous Air Pollutants (NESHAPs) 40 Code of Federal Regulation (CFR), Southern

California Air Quality Management District (SCAQMD) Rule 1403, Housing and Urban Development (HUD), and California Department of Public Health (CDPH) guidelines. The results of these studies will provide a description of the ACM and LBP locations, estimated quantity, and recommendations for removal, containment, and off-site transportation and disposal.

HAZ-8 **SCAQMD Rule 1403.** Notification and applicable fees will be submitted to the SCAQMD at least 10 days prior to proceeding with any demolition or renovation of a structure (refer to SCAQMD Rule 1403 (d)(1)(B)). The construction contractor will adhere to the requirements of SCAQMD Rule 1403 during renovation and demolition activities.

HAZ-9 **Soil Sampling.** Soil sampling will be performed at all locations within the Project area with potential hazardous waste concerns, prior to completion of PA&ED. These properties should be analyzed, at a minimum, for total petroleum hydrocarbons with carbon chain analysis, VOCs including fuel oxygenates and chlorinated solvents, and Title 22 Metals, using EPA Methods 8015B, 8260B, and 6010B/7471A, respectively. Testing at affected properties listed in Table 2.11.A is ongoing.

HAZ-10 **Groundwater.** Although excavation activities associated with the Project are not likely to encounter groundwater, should groundwater be encountered during construction/excavation activities and dewatering become necessary, regulatory compliance and permitting consistent with Santa Ana Regional Water Quality Control Board (SARWQCB) and National Pollutant Discharge Elimination System (NPDES) requirements should be adhered to, and groundwater sampling should be conducted.

HAZ-11 **Unknown Hazards.** During construction, soil excavations will be monitored for visible soil staining, odor, and the possible presence of unknown hazardous material sources, such as contaminated soil or buried 55-gallon drums and underground tanks. The contents of the partial, or partially buried, drum will be assessed and disposed of appropriately if this property is acquired as part of the Project. The

resident engineer overseeing construction will have available field monitoring equipment (e.g., photoionization detector) on site to facilitate timely detection of potentially hazardous conditions in the field. If signs of potential impact (odors, discolored soil, etc.) are noted or observed during construction activity, sampling and analysis should be conducted. Soil samples should be analyzed for total petroleum hydrocarbons (TPH) with carbon chain analysis using EPA Method 8015B and VOCs by EPA Method 8260B where run-off may have collected. If other hazardous materials contamination or sources are suspected or identified during Project construction activities, an environmental professional will evaluate the course of action required. This course of action will follow the Unknown Hazards Procedures described in Chapter 7 of the *Caltrans Construction Manual* (August 2006).

HAZ-12 **Preliminary Site Investigations.** To determine if special handling, treatment, or disposal provisions associated with hazardous wastes will be required for the Project, Preliminary Site Investigation(s) will be performed on parcels that may have Environmental Conditions based on the results of the ISA. The PSIs will be performed prior to completion of the Preliminary Engineering (Project Approval and Environmental Document, PA&ED) phase of the project for parcels that may be potentially impacted by any of the proposed Build Alternatives.

HAZ-13 **Notice of Unauthorized Release.** Prior to grading at Assessor's Parcel Number (APN) 0275-231-68, the responsible party will submit a Notice of Unauthorized Release, which documents the nature and extent of contamination, to the appropriate regulatory agency (either RWQCB or the Department of Toxic Substances Control [DTSC]).

HAZ-14 **Supplemental Site Investigation (SSI) Workplan.** Prior to the start of grading at APN 0275-231-68, an SSI Workplan will be developed, approved by Caltrans and the regulatory agency, and implemented to refine the lateral and vertical extent of tetrachloroethene (PCE) contamination in order to fully capture the extent of the soil vapor extraction (SVE) or equivalent remediation program. The SSI Workplan may include the following or equivalent:

a. Advance one additional soil vapor sampling location near 21900-15. Additional soil vapor probes should be installed at 10-foot (ft) intervals to 10 ft above groundwater.
b. Advance additional soil vapor locations off site to the west, south and east of the property.
c. Install three groundwater monitoring wells, one in the vicinity of the former dry cleaner and two additional locations to establish the groundwater gradient.
d. Develop newly installed groundwater monitoring wells and conduct groundwater monitoring.

HAZ-15 **SVE Pilot Test Workplan.** Prior to grading at APN 0275-231-68, an SVE Pilot Test Workplan will be developed, approved by the regulatory agency, and implemented. The purpose of the pilot test is to determine if SVE is the appropriate remediation technique to reduce PCE soil vapor levels to below the California Environmental Protection Agency California Human Health Screening Levels (CHHSLs) Commercial/Industrial Land Use Scenario, 2005. The SVE Pilot Test Workplan may include the following or equivalent:

a. A temporary SVE unit equipped with a SCAQMD 1166 Various Locations Permit
b. SVE extraction wells located in the vicinity of the former A-1 Dry Cleaner Building, and the western, southern, and eastern property boundaries
c. SVE monitoring points

The results of the SVE Pilot Test Workplan will be reported to the regulatory agency and used to develop and implement a final remediation plan during the final design phase.

HAZ-16 **Final Remediation Action Plan.** Prior to grading at APN 0275-231-68, a final remediation action plan will be prepared, approved by the regulatory agency, and implemented to reduce soil vapor levels to below the California Environmental Protection Agency CHHSLs Commercial/Industrial Land Use Scenario, 2005. The final remediation plan will rely on the results of the SSI Workplan and SVE Pilot Test Workplan to determine the appropriate remediation strategy.

If grading within the area of contamination begins before the soil vapor tests report levels below the CHHSLs, additional measures will be put into place during grading. At a minimum, these measures will include:

a. Obtain a Rule 1166 permit from the SCAQMD
b. 1166 monitoring for volatile organic compounds (VOCs) during excavation performed with a photoionization detector
c. Monitor breathing zone for VOCs with a photoionization detector

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2.12 Air Quality

2.12.1 Regulatory Setting

The Federal Clean Air Act (FCAA) as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (PB) and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and Federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

2.12.1.1 Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other Federal agencies from funding, authorizing, or approving plans, programs or projects that do not conform to State Implementation Plan (SIP) for attainting the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional, or planning and programming, level, and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulation (CFR) 93

govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California) sulfur dioxide (SO_2). California has attainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and a "hot spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide (CO) and/or particulate matter (PM_{10} or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measures a violation of the relevant standard and the U.S. EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by U.S. EPA and are then called "maintenance" areas. "Hot-spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot-

spot analysis. In general, projects must not cause the "hot-spot"-related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the Project vicinity, the Project must include measures to reduce or eliminate the existing violation(s) as well.

2.12.2 Affected Environment

This section is based on the *Air Quality Analysis* (September 2013) prepared for the Project.

2.12.2.1 Climate

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

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

The annual average temperature varies little throughout the Basin, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The climatological station closest to the site that monitors temperature is the San Bernardino Station. The annual average maximum temperature recorded at this station is 79.9°F, and the annual average minimum is 48.2°F. January is typically the coldest month in this area of the Basin.

The majority of annual rainfall in the Basin occurs between November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the Basin along the coastal side of the mountains. The climatological station closest to the site that monitors precipitation is the San Bernardino Station. Average rainfall measured at

this station varied from 3.25 inches in February to 0.71 inch or less between May and October, with an average annual total of 16.12 inches. Patterns in monthly and yearly rainfall totals are unpredictable due to fluctuations in the weather.

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

Inversion layers are significant in determining O_3 formation. O_3 and its precursors will mix and react to produce higher concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as CO. PM_{10} is both directly emitted and created indirectly in the atmosphere as a result of chemical reactions. Concentration levels of these pollutants are directly related to inversion layers due to the limitation of mixing space.

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

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

2.12.2.2 Monitored Air Quality

SCAQMD operates several air quality monitoring stations within the Basin. The San Bernardino Air Quality Monitoring Station, located approximately 5.5 miles (mi) northeast of the Project site at 24302 4th Street, monitors four of the five criteria pollutants: CO, O_3, NO_2, and PM. The next closest monitoring station that collects SO_2 data is the Rubidoux Station in Riverside County, which is located approximately 6 mi southwest of the Project site at 5888 Mission Boulevard. Air quality trends identified from data collected at both air quality monitoring stations between 2010 and 2012 are listed in Table 2.12.A.

Table 2.12.A Local Air Quality Levels

Pollutant		Standard	2010	2011	2012
Carbon Monoxide					
Max 1-hour concentration (ppm)			2.1	1.9	3.1
No. days exceeded:	State	> 20 ppm/1-hour	0	0	0
	Federal	> 35 ppm/1-hour	0	0	0
Max 8-hour concentration (ppm)			1.73	1.74	1.64
No. days exceeded:	State	>9 ppm/8-hour	0	0	0
	Federal	>9 ppm/8-hour	0	0	0
Ozone					
Max 1-hour concentration (ppm)			0.129	0.135	0.124
No. days exceeded:	State	> 0.09 ppm/1-hour	27	40	41
Max 8-hour concentration (ppm)			0.104	0.121	0.109
No. days exceeded:	State	> 0.07 ppm/8-hour	60	66	77
	Federal[1]	> 0.075 ppm/8-hour	40	39	54
Particulates (PM_{10})					
Max 24-hour concentration ($\mu g/m^3$)			61	54	51
No. days exceeded:	State	> 50 $\mu g/m^3$	2	2	1
	Federal	> 150 $\mu g/m^3$	0	0	0
Annual average concentration ($\mu g/m^3$)			32.4	31.2	32.0
Exceeds Standard?	State	> 20 $\mu g/m^3$	Yes	Yes	Yes
Particulates ($PM_{2.5}$)					
Max 24-hour concentration ($\mu g/m^3$)			39.3	65.0	34.8
No. days exceeded:	Federal[2]	> 35 $\mu g/m^3$	2	2	0
Annual average concentration ($\mu g/m^3$)			11.1	N/A	11.7
Exceeds Standard?	State	> 12 $\mu g/m^3$	No	N/A	No
	Federal	> 15 $\mu g/m^3$	No	N/A	No
Nitrogen Dioxide					
Max 1-hour concentration (ppm):	State	> 0.18 ppm/1-hour	0.069	0.062	0.060
No. days exceeded			0	0	0
Annual average concentration:	Federal	0.053 ppm annual average	0.019	0.017	N/A
Exceed federal standard?			No	No	N/A
Sulfur Dioxide					
Max 24-hour concentration (ppm)			0.005	0.001	0.001
No. days exceeded:	State	0.04 ppm	0	0	0
	Federal	0.14 ppm	0	0	0
Annual average concentration:	Federal	0.030 ppm annual average	0.001	0.000	0.000
Exceed federal standard?			No	No	No

Source: EPA and ARB (2010 to 2012).

2.12.2.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the general population. Sensitive populations (sensitive receptors) that are in proximity to localized sources of toxics and CO are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. The sensitive receptors within or adjacent to the Project area are single-family dwellings, Terrace Village RV Park, Grand Terrace Mobile Home Park, and Grand Royal Estates Mobile Home Park, as well as Grand Terrace Elementary School.

2.12.2.4 Criteria Pollutant Attainment/Nonattainment Status

The EPA General Conformity Rule applies only to federal actions that result in emissions of nonattainment or maintenance pollutants, or their precursors, in federally designated nonattainment or maintenance areas. The EPA General Conformity Rule establishes a process to demonstrate that federal actions would be consistent with applicable SIPs and would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay the timely attainment of the NAAQS. The emissions thresholds that trigger requirements of the General Conformity Rule for federal actions emitting nonattainment or maintenance pollutants, or their precursors, are called de minimis levels. The general conformity de minimis thresholds are defined in 40 CFR 93.153(b). The Federal General Conformity Rule does not apply to federal actions in areas designated as nonattainment of only the California ambient air quality standards (CAAQS).

The national and California ambient air quality standards (AAQS) for the criteria pollutants are summarized in Table 2.12.B.

The EPA, in conjunction with the DOT, established the Transportation Conformity Rule on November 30, 1993. The rule implements the CAA conformity provision, which mandates that the federal government not engage, support, or provide financial assistance for licensing or permitting or approve any activity not conforming to an approved CAA implementation plan. As part of the Clean Air Rules of 2004, the EPA published a final rule in the Federal Register on July 1, 2004, to amend the Transportation Conformity Rule to include criteria and procedures for the new 8-hour ozone (O_3) and fine particulate matter ($PM_{2.5}$) NAAQS. The final rule addressed a March 2, 1999, court decision by incorporating the EPA and DOT guidance. On July 20, 2004, the EPA published a technical correction notice to correct two minor errors

Table 2.12.B State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Ozone (O_3)[2]	1 hour 8 hours	0.09 ppm 0.070 ppm ---	---[4] 0.075 ppm (4th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NO_X) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	Federal: Extreme Nonattainment (8-hour) State: Nonattainment (1-hour and 8-hour)
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm[1] 6 ppm	35 ppm 9 ppm ---	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Federal: Attainment/ Maintenance State: Attainment
Respirable Particulate Matter (PM_{10})[2]	24 hours Annual	50 µg/m^3 20 µg/m^3	150 µg/m^3 ---[2] (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke and vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Federal: Attainment/Maintenance State: Nonattainment
Fine Particulate Matter ($PM_{2.5}$)[2]	24 hours Annual 24 hours (conformity process[5]) Secondary Standard (annual; also for conformity process)	--- 12 µg/m^3 ---	35 µg/m^3 12.0 µg/m^3 65 µg/m^3 15 µg/m^3 (98th percentile over 3 years)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NO_X, sulfur oxides (SO_X), ammonia, and ROG.	Federal: Nonattainment State: Nonattainment
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm[6] (98th percentile over 3 years) 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NO_X" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	Federal: Attainment/ Maintenance State: Nonattainment

Table 2.12.B State and Federal Criteria Air Pollutant Standards, Effects, and Sources (Continued)

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours	0.25 ppm --- 0.04 ppm	0.075 ppm[7] (98th percentile over 3 years) 0.5 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified
Lead (Pb)[3]	Monthly Rolling 3-month average	1.5 µg/m^3 ---	--- 0.15 µg/m^3 [10]	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.	Federal: Attainment (Except LA County) State: Attainment (Except LA County)
Sulfate	24 hours	25 µg/m^3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70 percent	---	Reduces visibility. Produces haze. NOTE: not related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other “Class I” areas.	See particulate matter above.	Federal: Attainment/ Unclassified State: Attainment/ Unclassified

Table 2.12.B State and Federal Criteria Air Pollutant Standards, Effects, and Sources (Continued)

Pollutant	Averaging Time	State Standard[8]	Federal Standard[9]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status
Vinyl Chloride[3]	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	Federal: Attainment/ Unclassified State: Attainment/ Unclassified

Sources: www.arb.ca.gov/research/aaqs/aaqs2.pdf (September 8, 2010); California Air Resources Board, Area Designations, http://www.arb.ca.gov/desig/desig.htm (accessed August 2013).

1 Rounding to an integer value is not allowed for the State 8-hour CO standard. Violation occurs at or above 9.05 ppm.

2 Annual PM_{10} NAAQS revoked October 2006; was 50 µg/m^3. 24-hour. $PM_{2.5}$ NAAQS tightened October 2006; was 65 µg/m^3. Annual $PM_{2.5}$ NAAQS tightened from 15 µg/m^3 to 12 µg/m^3 December 2012, and secondary standard set at 15 µg/m^3.

3 The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the ARB and the EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for substantial health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

4 Prior to June 2005, the 1-hour NAAQS was 0.12 ppm. Emission budgets for 1-hour ozone are still in use in some areas where 8-hour ozone emission budgets have not been developed, such as the San Francisco Bay Area.

5 The 65 µg/m^3 $PM_{2.5}$ (24-hour) NAAQS was not revoked when the 35 µg/m^3 NAAQS was promulgated in 2006. The 15 µg/m^3 annual $PM_{2.5}$ standard was not revoked when the 12 µg/m^3 standard was promulgated in 2012. The 0.08 ppm 1997 ozone standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (July 20, 2013). Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with a emission budget, EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the "Interim" period prior to availability of emission budgets, conformity tests may include some combination of build vs. no build, build vs. baseline, or compliance with prior emission budgets for the same pollutant.

6 Final 1-hour NO_2 NAAQS published in the Federal Register on February 9, 2010, effective March 9, 2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause redesignation to nonattainment in some areas after 2016.

7 The EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010. Nonattainment areas have not yet been designated as of September 2012.

8 State standards are "not to exceed" or "not to be equaled or exceeded" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as described above.

9 Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

10 Lead NAAQS are not considered in Transportation Conformity analysis.

in the July 1, 2004, notice. To remain consistent with the stricter federal standards, the ARB approved a new 8-hour O_3 standard (0.07 parts per million [ppm], not to be exceeded) for O_3 on April 28, 2005. Additionally, the ARB retained the current 1-hour-average standard for O_3 (0.09 ppm) and the current monitoring method for O_3, which uses the ultraviolet (UV) photometry method.

In April 2003, the EPA was cleared by the White House Office of Management and Budget (OMB) to implement the 8-hour ground-level O_3 standard. ARB provided the EPA with California's recommendations for 8-hour O_3 area designations on July 15, 2003. The recommendations and supporting data were an update to a report submitted to the EPA in July 2000. On December 3, 2003, the EPA published its proposed designations. The EPA's proposal differs from the State's recommendations primarily on the appropriate boundaries for several nonattainment areas. The ARB responded to the EPA's proposal on February 4, 2004. On April 15, 2004, the EPA announced the new nonattainment areas for the 8-hour O_3 standard. The designations and classifications became effective on June 15, 2004. The transportation conformity requirement became effective on June 15, 2005.

The EPA proposed a $PM_{2.5}$ implementation rule in September 2003 and made final designations in December 2004. The $PM_{2.5}$ standard complements existing national and State ambient air quality standards that target the full range of inhalable coarse particulate matter (PM_{10}).

Attainment status for each of the criteria pollutants in the Basin is listed in Table 2.12.B.

2.12.3 Environmental Consequences

2.12.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. The No Build Alternative would not involve construction activities in the Project area; therefore, temporary air quality impacts related to construction equipment exhaust emissions and fugitive dust would not occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Construction Emissions

During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment also are

anticipated and would include CO, NO_X, volatile organic compounds (VOCs), directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. Build Alternatives 3, 6, and Modified Alternative 7 would require approximately 208,000 cubic yards (cy), 157,000 cy, and 175,000 cy of net soil export, respectively. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM_{10}, $PM_{2.5}$, CO, SO_2, NO_X, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting federal standards can contain up to 5,000 ppm of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO_2-related issues due to diesel exhaust would be minimal.

The maximum amount of construction-related emissions during a peak construction day for any of the Build Alternatives is presented in Table 2.12.C. The PM_{10} and $PM_{2.5}$ emissions assume a 50 percent control of fugitive dust from watering and

Table 2.12.C Maximum Project Construction Emissions

Project Phases	ROG	CO	NO_X	Total PM_{10}	Total $PM_{2.5}$
Grubbing/Land Clearing (lbs/day)	2.7	14.6	23.9	51.2	11.5
Grading/Excavation (lbs/day)	18.5	88.8	253.5	60	19.3
Drainage/Utilities/Sub-Grade (lbs/day)	12.1	54.5	122.5	56.2	16.1
Paving (lbs/day)	2.9	14.3	22.3	1.5	1.3
Maximum (lbs/day)	18.5	88.8	253.5	60	19.3
Total (tons/construction project)	3.3	15.8	41.4	13	3.9

Source: LSA Associates, Inc. (September 2013).

associated dust control measures, which is required by the California Department of Transportation (Caltrans) and SCAQMD. The emissions presented below are based on the best information available at the time of calculations and specify that construction would be complete in approximately 24 months, beginning in 2016 and ending in 2018. Caltrans Standard Specifications for construction (Section 14-9 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plant Emissions]) will be adhered to in order to reduce emissions generated by construction equipment. Additionally, the SCAQMD has established Rule 403 for reducing fugitive dust emissions. The best available control measures (BACM), as specified in SCAQMD Rule 403, shall be incorporated into the Project commitments. With the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., minimum twice per day) and Measures AQ-1 through AQ-5, fugitive dust and exhaust emissions from construction activities would not result in any substantial air quality impacts with implementation of Build Alternatives 3, 6, or Modified Alternative 7.

Naturally Occurring Asbestos

The Project is located in San Bernardino County, which is not among the counties listed as containing serpentine and ultramafic rock. No impacts from naturally occurring asbestos (NOA) during Project construction are anticipated.

2.12.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. This alternative would not improve operations or reduce congestion at the Interstate 215 (I-215)/Barton Road interchange; therefore, no permanent impacts to air quality would occur.

Separately, the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. It was determined that this approved project would not substantially impact air quality.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Regional Air Quality Conformity

The Project is listed in the 2012 financially constrained Regional Transportation Plan, which was found to conform by the Southern California Association of Governments (SCAG) on April 2, 2012, and FHWA and FTA made a regional conformity finding for the RTP on June 5, 2012. The Project is also included in SCAG's financially constrained 2013 FTIP. The 2013 FTIP was determined to conform by FHWA and FTA on December 13, 2012 (Project ID: SBD31850; Model No. S310. Description: *In Grand Terrace at I-215/Barton Road Interchange. Reconstruct overcrossing and ramps with partial cloverleaf configuration; northwest of I-215 work includes the addition of northbound aux lane; local street work to include widening of Barton Road, removal of La Cross Avenue between Vivienda Avenue and Barton Road, replacement with new local road, improvements to Barton Road and Michigan Way/Vivienda Avenue intersection and realignment of Commerce Way*). The design concept and scope of the Project is consistent with the project description in the 2012 RTP and the 2013 FTIP, and the open to traffic assumptions of SCAG's regional emissions analysis.

Project Level Conformity

Because the Project is within an attainment/maintenance area for CO and PM_{10} and a nonattainment area for $PM_{2.5}$ federal standards, local hot-spot analyses for CO, $PM_{2.5}$, and PM_{10} are required for conformity purposes. The results of these hot-spot analyses are provided below.

Carbon Monoxide

The methodology required for a CO local analysis is summarized in the Caltrans Transportation Project-Level Carbon Monoxide Protocol (Protocol), Section 3 (Determination of Project Requirements) and Section 4 (Local Analysis). In Section 3, the Protocol provides two conformity requirement decision flowcharts that are designed to assist the Project sponsors in evaluating the requirements that apply to specific projects. The flowchart in Figure 1 of the Protocol (CO Protocol flowchart in Appendix A of the *Air Quality Analysis*) applies to new projects and was used in this local analysis conformity decision. Below is a step-by-step explanation of the flow

chart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the Project. The flowchart begins with Section 3.1.1:

- 3.1.1. Is this project exempt from all emissions analyses?
  NO.

  Table 1 of the Protocol is Table 2 of Section 93.126 of 40 Code of Federal Regulations (CFR). Section 3.1.1 is inquiring if the Project is exempt. Such projects appear in Table 1 of the Protocol. The Project does not appear in Table 1. Therefore, it is not exempt from all emissions analyses.

- 3.1.2. Is the project exempt from regional emissions analyses?
  NO.

  Table 2 of the Protocol is Table 3 of Section 93.127. The question is attempting to determine whether the Project is listed in Table 2. Although the Project is an interchange reconfiguration project, it includes additional through lanes on Barton Road. Therefore, it is not exempt from regional emissions analysis.

- 3.1.3. Is the project locally defined as regionally significant?
  YES.

  As mentioned above, the Project includes additional through lanes on Barton Road. Therefore, the Project is potentially regionally significant.

- 3.1.4. Is the project in a federal attainment area?
  NO.

  The Project is located within an attainment/maintenance area for the federal CO standard.

- 3.1.5. Are there a currently conforming Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP)?
  YES.

- 3.1.6. Is the project included in the regional emissions analysis supporting the currently conforming RTP and TIP?
  YES.

The Project is included in the SCAG 2012 RTP and the 2013 FTIP (Project ID: SBD31850; Model No. S310. Description: *In Grand Terrace at Barton Road Interchange. Reconstruct overcrossing and ramps with partial cloverleaf configuration; northwest of I-215 work includes the addition of northbound aux lane; local street work to include widening of Barton Road, removal of La Cross Avenue between Vivienda Avenue and Barton Road, replacement with new local road, improvements to Barton Road and Michigan Way/Vivienda Avenue intersection and realignment of Commerce Way*).

- 3.1.7. Has the project design concept and/or scope changed significantly from that in the regional analysis?
  NO.

  The Build Alternatives are consistent with the Project description in the 2012 RTP and 2013 FTIP.

- 3.1.9. Examine local impacts.
  Section 3.1.9 of the flowchart directs the Project evaluation to Section 4 (Local Analysis) of the Protocol. This includes Figure 1.

Section 4 contains Figure 3 (Local CO Analysis). This flowchart is used to determine the type of CO analysis required for the Project. Below is a step-by-step explanation of the flowchart. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the Project. The flowchart begins at level 1:

- Level 1. Is the project in a CO non-attainment area?
  NO.

  The Project site is located in an area that has demonstrated attainment with the federal CO standard.

- Level 1 (cont.). Was the area redesignated as “attainment” after the 1990 Clean Air Act?
  YES.

- Level 1 (cont.). Has “continued attainment” been verified with the local Air District, if appropriate?
  YES.

The South Coast Air Basin was designated as attainment/maintenance by the EPA on June 11, 2007 (proceed to Level 7).

- Level 7. Does the project worsen air quality?
  YES.

  Because one of the following conditions (listed in Section 4.7.1 of the CO Protocol) is met, the Project would potentially worsen air quality.

  a. The project significantly increases the percentage of vehicles operating in cold start mode. Increasing the number of vehicles operating in cold start mode by as little as 2 percent should be considered potentially significant.

  The percentage of vehicles operating in cold start mode is the same or lower for the intersection under study compared to those used for the intersection in the attainment plan. It is assumed that all vehicles in the intersection are in a fully warmed-up mode. Therefore, this criterion is not met.

  b. The project significantly increases traffic volumes. Increases in traffic volumes in excess of 5 percent should be considered potentially significant. Increasing the traffic volume by less than 5 percent may still be potentially significant if there is also a reduction in average speeds.

  The Project would not increase the daily traffic volumes along I-215. However, the Project would significantly change the traffic volumes along Barton Road between Michigan Street and Vivienda Avenue. Therefore, this criterion is met. The 2040 traffic volumes for the No Build and the Build Alternatives are shown in Table 2.12.D.

  c. The project worsens traffic flow. For uninterrupted roadway segments, a reduction in average speeds (within a range of 3 to 50 mph) should be regarded as worsening traffic flow. For intersection segments, a reduction in average speed or an increase in average delay should be considered as worsening traffic flow.

  As shown in Tables 2.12.E through 2.12.H, the Build Alternatives would reduce the level of service (LOS) at the intersection of Barton Road and La Cadena Drive in the AM peak hour. However, the LOS would remain acceptable. In addition, the LOS at the other intersections within the Project area would improve under the Build Alternatives. Therefore, this criterion is not met.

Table 2.12.D 2040 Average Daily Traffic Volumes (Total AADT/Truck AADT)

Roadway Link	Alternative 1 Traffic Volumes	Alternative 3 Traffic Volumes	Alternative 6 Traffic Volumes	Modified Alternative 7 (Preferred Alternative) Traffic Volumes
I-215 between Washington and Barton Road	332,800 (23,296)	332,800 (23,296)	332,800 (23,296)	332,800 (23,296)
I-215 between Barton Road and Iowa	306,100 (21,427)	306,100 (21,427)	306,100 (21,427)	306,100 (21,427)
Barton Road west of Grand Terrace Road	25,750 (1,803)	24,300 (1,701)	24,300 (1,701)	24,300 (1,701)
Barton Road between Grand Terrace Road and I-215	25,850 (1,810)	26,490 (1,854)	26,490 (1,854)	26,490 (1,854)
Barton Road between I-215 and Michigan Street	44,350 (3,105)	44,250 (3,098)	34,690 (2,428)	44,250 (3,098)
Barton Road between Michigan Street and Vivienda Avenue	39,250 (2,748)	44,250 (3,098)	34,690 (2,428)	44,250 (3,098)

Source: *Air Quality Analysis* (September 2013).

Table 2.12.E 2040 without Project (No Build Alternative) Intersection LOS

Intersection		AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
1.	Barton Road/La Cadena Drive	C	31.4	0.94	F	169.3	1.51
2.	Barton Road/Grand Terrace Road	F	>500	-	F	>500	-
3.	Barton Road/La Crosse Avenue	F	223.4	-	F	>500	-
4.	Barton Road/I-215 SB Ramps	F	184.8	1.40	F	290.6	1.70
5.	Barton Road/I-215 NB Ramps	F	99.7	1.31	F	251.3	1.66
6.	Barton Road/Michigan Street	F	101.7	1.20	F	135.7	1.32
7.	Barton Road/Vivienda Avenue	F	434.9	-	F	>500	-

Source: *Air Quality Analysis* (September 2013).

Table 2.12.F 2040 Alternative 3 Intersection LOS

Intersection		AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
1.	Barton Road/La Cadena Drive	D	35.5	0.97	F	163.7	1.49
2.	Barton Road/Grand Terrace Road	A	6.3	0.60	A	5.5	0.60
3.	Barton Road/La Crosse Avenue	Does Not Exist					
4.	Barton Road/I-215 SB Ramps	B	14.6	0.68	B	12.9	0.61
5.	Barton Road/I-215 NB Ramps	A	9.5	0.71	B	13.7	0.83
6.	Barton Road/Michigan Street	Does Not Exist					
7.	Barton Road/Vivienda Avenue	D	45.7	0.91	D	38.8	0.90

Source: *Air Quality Analysis* (September 2013).

Table 2.12.G 2040 Alternative 6 Intersection LOS

Intersection		AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
1.	Barton Road/La Cadena Drive	D	38.8	0.96	F	165.9	1.49
2.	Barton Road/Grand Terrace Road	A	7.6	0.61	A	7.2	0.58
3.	Barton Road/La Crosse Avenue	Does Not Exist					
4.	Barton Road/I-215 SB Ramps	B	20.0	0.68	B	16.3	0.63
5.	Barton Road/I-215 NB Ramps	C	23.3	0.90	B	19.1	0.83
6.	Barton Road/Michigan Street	Does Not Exist					
7.	Barton Road/Vivienda Avenue	D	50.7	0.93	D	50.0	0.95

Source: *Air Quality Analysis* (September 2013).

Table 2.12.H 2040 Modified Alternative 7 (Preferred Alternative) Intersection LOS

Intersection		AM Peak Hour			PM Peak Hour		
		LOS	Delay (sec)	V/C	LOS	Delay (sec)	V/C
1.	Barton Road/La Cadena Drive	D	40.0	0.97	F	168.7	1.49
2.	Barton Road/Grand Terrace Road	A	8.6	0.62	A	5.2	0.58
3.	Barton Road/La Crosse Avenue	Does Not Exist					
4.	Barton Road/I-215 SB Ramps	B	13.6	0.69	B	11.3	0.62
5.	Barton Road/I-215 NB Ramps	B	13.9	0.70	C	30.5	0.95
6.	Barton Road/Michigan Street	C	26.6	0.69	C	23.3	0.55
7.	Barton Road/Vivienda Avenue	D	51.9	0.90	D	45.2	0.97

Source: *Air Quality Analysis* (September 2013).

- Level 7 (cont.). Is the project suspected of resulting in higher CO concentrations than those existing within the region at the time of attainment demonstration? NO.

  CO concentrations at the intersections under study will be lower than those reported for the maximum of the intersections analyzed in the CO attainment plan because all of the following conditions, listed in Section 4.7.2 of the CO Protocol, are satisfied:

  - The receptor locations at the intersections under study are at the same distance or farther from the traveled roadway than the receptor locations used in the intersections in the attainment plan. The attainment plan evaluates the CO concentrations at a distance of 10 feet (ft) from the edge of the roadways. The CO Protocol does not permit the modeling of receptor locations closer than this distance.

- The Project intersection traffic volumes and geometries are not substantially different from those included in the attainment plan. Also, the intersections under study have less total traffic and the same number of lanes or fewer lanes than the intersections in the attainment plan.
- The assumed meteorology for the intersections under study is the same as the assumed meteorology for the intersections in the attainment plan. Both use the worst-case scenario meteorology settings in the CALINE4 and/or CAL3QHC models.

  As shown in Table 2.12.I, traffic lane volumes for all approach and departure segments are lower for the intersections under study than those assumed for the intersections in the attainment plan. The intersections in the attainment plan include Wilshire Boulevard/Veteran Avenue, Sunset Boulevard/Highland Avenue, La Cienega Boulevard/Century Boulevard, and Long Beach Boulevard/Imperial Highway.[1] The intersections under study were selected based on their LOS and the Build Alternative's contribution to the total traffic volumes.
- The percentages of vehicles operating in cold start mode are the same or lower for the intersections under study compared to those used for the intersections in the attainment plan. It is assumed that all vehicles in the intersections are operating in fully warmed-up mode.
- The percentages of heavy-duty gas trucks in the intersections under study are the same or lower than the percentages used for the intersections in the attainment plan analysis. It is assumed that traffic distribution at the intersections under study does not vary from the EMFAC2007 standards.
- Average delay and queue length for each approach are the same or less for the intersections under study compared to those found in the intersections in the attainment plan. The predicted LOS for the intersections under study range from A to F. The LOS for the intersections in the attainment plan are not listed; however, the traffic counts and intersection geometries correspond to an LOS F for three of the four intersections in the attainment plan.

[1] At the time of attainment plan preparation, these intersections represented the "worst-case" for CO concentrations.

Table 2.12.I Traffic Volume Comparison

Attainment Plan Maximum Volumes	**Intersection 1**		**Intersection 2**		**Intersection 3**		**Intersection 4**	
	AM	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Existing Traffic Volumes	Wilshire Boulevard/ Veteran Avenue		Sunset Boulevard/ Highland Avenue		La Cienega Boulevard/ Century Boulevard		Long Beach Boulevard/ Imperial Highway	
Intersection Total	8,062	7,719	6,614	7,374	6,635	8,674	4,212	5,514
Turn Maximum	384	780	200	263	700	1,187	176	202
2040 Conditions No Build Alternative	Barton Road/ La Cadena Drive		Barton Road/ Grand Terrace Road		Barton Road/ La Crosse Avenue		Barton Road/ I-215 SB Ramps	
Intersection Total	4,244	6,427	1,947	2,640	1,804	2,654	2,766	3,442
Turn Maximum	620	682	190	52	306	360	907	615
2040 Conditions Alternative 3	Barton Road/ La Cadena Drive		Barton Road/ Grand Terrace Road		Barton Road/ La Crosse Avenue		Barton Road/ I-215 SB Ramps	
Intersection Total	4,244	6,427	1,995	2,733	N/A	N/A	3,356	3,787
Turn Maximum	620	682	186	175	N/A	N/A	907	615
2040 Conditions Alternative 6	Barton Road/ La Cadena Drive		Barton Road/ Grand Terrace Road		Barton Road/ La Crosse Avenue		Barton Road/ I-215 SB Ramps	
Intersection Total	4,244	6,427	1,995	2,733	N/A	N/A	3,059	3,786
Turn Maximum	620	682	186	175	N/A	N/A	907	615
2040 Conditions Modified Alternative 7 (Preferred Alternative)	Barton Road/ La Cadena Drive		Barton Road/ Grand Terrace Road		Barton Road/ La Crosse Avenue		Barton Road/ I-215 SB Ramps	
Intersection Total	4,244	6,427	1,995	2,733	N/A	N/A	3,059	3,786
Turn Maximum	620	682	186	175	N/A	N/A	907	615
Build Alternative Maximum Volumes	**Intersection 5**		**Intersection 6**		**Intersection 7**			
	AM	**PM**	**AM**	**PM**	**AM**	**PM**		
2040 Conditions No Build Alternative	Barton Road/ I-215 NB Ramps		Barton Road/ Michigan Street		Barton Road/ Vivienda Avenue			
Intersection Total	4,087	3,736	4,085	5,057	2,795	3,951		
Turn Maximum	868	901	896	616	165	45		
2040 Conditions Alternative 3	Barton Road/ I-215 NB Ramps		Barton Road/ Michigan Street		Barton Road/ Vivienda Avenue			
Intersection Total	4,076	4,726	N/A	N/A	4,197	5,104		
Turn Maximum	868	901	N/A	N/A	896	616		
2040 Conditions Alternative 6	Barton Road/ I-215 NB Ramps		Barton Road/ Michigan Street		Barton Road/ Vivienda Avenue			
Intersection Total	3,677	3,071	N/A	N/A	4,354	5,172		
Turn Maximum	747	700	N/A	N/A	1,042	958		
2040 Conditions Modified Alternative 7 (Preferred Alternative)	Barton Road/ I-215 NB Ramps		Commerce Way/ Michigan Street		Barton Road/ Vivienda Avenue			
Intersection Total	4,076	4,726	2,202	2,226	4,197	5,104		
Turn Maximum	868	901	809	660	896	616		

Source: *Air Quality Analysis* (September 2013).

- The background CO concentrations in the area of the intersections under study are 3.7 parts per million (ppm) for 1 hour and 2.3 ppm for 8 hours, which is lower than the background concentrations for the intersections in the attainment plan. These varied from 5.3 to 13.2 ppm for 1 hour and 3.7 to 9.9 ppm for 8 hours.

The Project is not expected to result in any concentrations exceeding the 1-hour or 8-hour CO standards. Therefore, a detailed CALINE4 CO hot-spot analysis is not required.

Particulate Matter (PM_{10} and $PM_{2.5}$)

The Project is within an attainment/maintenance area for federal PM_{10} and a nonattainment area for federal $PM_{2.5}$ standards. Therefore, per 40 CFR, Part 93, analyses are required for conformity purposes. However, the EPA does not require hot-spot analyses, qualitative or quantitative, for projects that are not listed in Section 93.123(b)(1) as an air quality concern. The Project does not qualify as a Project of air quality concern (POAQC) because of the following reasons:

i) The Project is not a new or expanded highway project. The Project is an interchange reconstruction Project that does not increase the capacity of I-215. This type of Project improves freeway interchange operations by reducing traffic congestion and improving merge operations. Based on the *Revised Traffic Operations Analysis* (December 2011) and the *Barton Road Interchange Improvement Project Roundabout Analyses* (August 2013), the Build Alternatives would increase the capacity of Barton Road through the interchange. However, the traffic volumes along Barton Road would not exceed the 125,000 average daily trips threshold for a POAQC. In addition, the total truck percentages along Barton Road would not exceed the 8 percent threshold, and the total truck average annual daily traffic (AADT) would not exceed the 10,000-vehicle threshold for POAQC. The future traffic volumes along I-215 and Barton Road are shown previously in Table 2.12.D.
ii) The Project does not affect intersections that are at LOS D, E, or F with a significant number of diesel vehicles. Based on the *Revised Traffic Operations Analysis* (December 2011) and the *Barton Road Interchange Improvement Project Roundabout Analyses* (August 2013), the Build Alternatives would reduce the delay and improve the LOS at intersections within the Project vicinity. The LOS conditions in the Project vicinity with and without the Build Alternatives are shown in Tables 2.12.E through 2.12.H.
iii) The Project does not include the construction of a new bus or rail terminal.

iv) The Project does not expand an existing bus or rail terminal.
v) The Project is not in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The Project-level PM hot-spot analysis was presented to SCAG's Transportation Conformity Working Group (TCWG) for discussion and review on August 25, 2009. Per Caltrans Headquarters policy, all nonexempt projects need to go through review by the TCWG. This Project was approved and concurred upon by Interagency Consultation at the TCWG meeting as a Project not having substantial impacts on air quality, and it meets the requirements of the Clean Air Act (CAA) and 40 CFR 93.116. On May 28, 2013, the TCWG confirmed that the addition of Modified Alternative 7 would not change the Project's determination. Copies of the TCWG findings are included in Chapter 3.

Therefore, the Project meets the CAA requirements and 40 CFR 93.116 without any explicit hot-spot analysis. The Project would not create a new, or worsen an existing, PM_{10} or $PM_{2.5}$ violation.

Mobile-Source Air Toxics

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

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in its latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter (POM). While FHWA considers these the

priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule described above requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 2.12.1. The projected reduction in MSAT emissions would be slightly different in California due to the use of the EMFAC2007 emission model in place of the MOBILE6.2 model.

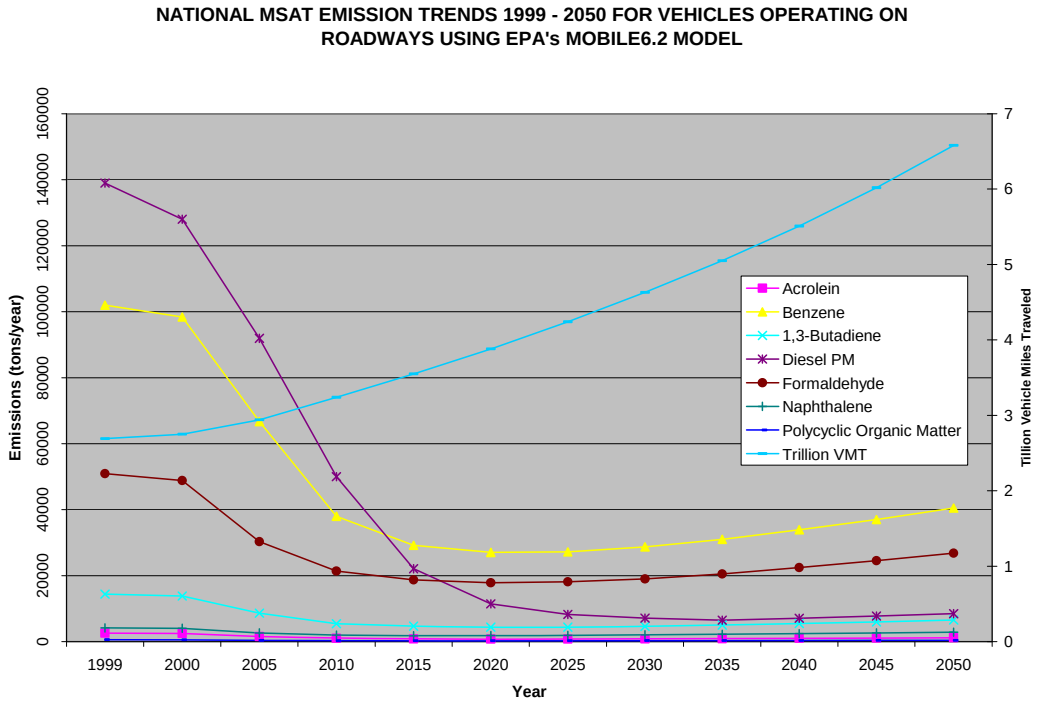


Figure 2.12.1 National MSAT Emission Trends

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

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the federal government be interpreted and administered in accordance with its environmental protection goals. NEPA also requires federal agencies to use an interdisciplinary approach in planning and decision-making for any action that substantially impacts the environment. NEPA requires, and FHWA is committed to, the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulation at 23 CFR Part 771.

In December 2012, the FHWA issued guidance[1] to advise FHWA division offices as to when and how to analyze MSATs in the NEPA process for highways. This document is an update to the guidance released in February 2006 and September 2009. The guidance is described as interim because MSAT science is still evolving. As the science progresses, FHWA will update the guidance. This analysis follows the FHWA guidance.

Information that is Unavailable or Incomplete

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

[1] http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm.

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

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on MSAT analysis in NEPA Documents. Among the substantial health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the substantial human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts. Each step in the process builds on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of Project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways, to determine the portion of time that people are actually exposed at a specific location, and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern

expressed by HEI. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA and the HEI have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

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

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers, who would need to weigh this information against Project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion such as the example provided in this Appendix (reflecting any local and Project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with Council on Environmental Quality regulations [40 CFR 1502.22(b)]. FHWA Headquarters and Resource Center staff members Victoria Martinez ([787] 766-5600, ext. 231),

Bruce Bender ([202] 366-2851), and Michael Claggett ([505] 820-2047) are available to provide guidance and technical assistance and support.

Qualitative Project-Level MSAT Analysis

With the Project, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The Project is an interchange improvement project that increases the capacity of Barton Road. This type of project improves roadway operations by reducing traffic congestion and improving traffic operations. As shown in Tables 2.12.E through 2.12.H, the Build Alternatives would reduce the delay and either improve the LOS or maintain the LOS at the same level as without the Project at six out of seven of the study area intersections. In 2040, some Build Alternatives would result in a slight decrease in the a.m. peak-hour LOS at the Barton Road/La Cadena Drive intersection. However, the decrease in LOS from C to D in the a.m. peak hour is considered acceptable from a traffic perspective. In addition, as identified in the *Traffic Operations Analysis,* the City of Colton has included a project to improve this intersection in its Capital Improvement Program.

With the Project, emissions are projected to be lower in the design year than existing levels as a result of the EPA's national control programs, which are projected to reduce MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future than they are today.

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

Long-Term Regional Vehicle Emission Impacts

The purpose of the Project is to alleviate substantial traffic congestion and delays during the morning and afternoon peak periods and to accommodate projected future traffic volumes at the I-215/Barton Road interchange. The Project would not generate new vehicular traffic trips since it would not construct new homes or businesses. However, there is a possibility that some traffic currently utilizing other routes would

be attracted to use the improved facility, thus resulting in increased VMT. Therefore, the potential impact of the Build Alternatives on regional vehicle emissions was calculated using traffic data for the Project region and emission rates from the EMFAC2007 emission model.

A supplemental traffic analysis (January 2012) was prepared that estimated the impact that the Build Alternatives would have on regional VMT and vehicle hours traveled (VHT), as shown in Table 2.12.J. This VMT and VHT data, along with the EMFAC2007 emission rates, were used to calculate CO, reactive organic gases (ROGs), NO_X, sulfur oxide (SO_X), PM_{10}, and $PM_{2.5}$ emissions for the 2040 regional conditions. The results of the modeling are summarized in Table 2.12.K. As shown in Table 2.12.K, the Build Alternatives would add less than 11 pounds per day (lbs/day) of CO, ROG, NO_X, SO_X, PM_{10} or $PM_{2.5}$ to the region when compared to the No Build Alternative. Therefore, the Project would not contribute substantially to regional vehicle emissions.

Table 2.12.J 2040 Regional Traffic Data

Scenario	VMT	VHT	Average Speed (mph)
Existing 2009	2,602,749	71,498	36.4
No Build	3,677,227	103,183	35.6
Alternative 3	3,682,867	103,301	35.7
Alternative 6	3,683,833	103,239	35.7
Modified Alternative 7	3,679,674	103,108	35.7

Source: *Air Quality Analysis* (September 2013).

Table 2.12.K 2040 Regional Vehicle Emissions (lbs/day)

Pollutant	Existing	No Build	Alternative 3	Alternative 6	Modified Alternative 7 (Preferred Alternative)
CO	14,993	6,031	6,041	6,042	6,035
ROG	757	292	292	292	292
NO_X	4,573	1,492	1,494	1,494	1,493
SO_X	23	32	32	32	32
PM_{10}	275	332	333	333	333
$PM_{2.5}$	184	203	203	203	203

Source: *Air Quality Analysis* (September 2013).

Air Quality Conformity Analysis

An Air Quality Conformity Analysis was prepared and submitted to FHWA on January 23, 2014, requesting a Project-Level Conformity Determination. The Project-

Level Conformity Determination was issued by FHWA on February 20, 2014. FHWA found that the I-215/Barton Road Interchange Improvement Project conforms to the State Implementation Plan (SIP) in accordance with 40 CFR Part 93. FHWA's Determination letter in this regard is included in Appendix H of this Environmental Document.

Qualitative Assessment of Construction Emissions

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities. Emissions from construction equipment also are expected and would include carbon monoxide (CO), nitrogen oxides (NO_X), volatile organic compounds (VOCs), directly-emitted particulate matter (PM_{10} and $PM_{2.5}$), and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NO_X and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction typically involves clearing, cut-and-fill activities, grading, removing or improving existing roadways, building bridges, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities could temporarily generate enough PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NO_X, and VOCs to be of concern. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an added source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the United States Environmental Protection Agency (U.S. EPA) to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up 50 percent. The Department's Standard Specifications (Section 14-9.03) on dust minimization

requirements requires use of water or dust palliative compounds and will reduce potential fugitive dust emissions during construction.

In addition to dust-related PM_{10} emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site. As a control measure for equipment emissions related to diesel exhaust, areas within 200 feet of ARB-defined sensitive land uses will be designated as no-idle areas where material storage/transfer and equipment maintenance activities are not to occur.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel (not more than 15 ppm sulfur), so SO_2-related issues due to diesel exhaust will be minimal.

Some phases of construction, particularly asphalt paving, may result in short-term odors in the immediate area of each paving site(s). Such odors would quickly disperse to below detectable levels as distance from the site(s) increases.

Construction Conformity

Construction activities will not last for more than 5 years at one general location, so construction-related emissions do not need to be included in regional and Project-level conformity analysis (40 CFR 93.123(c)(5)).

2.12.4 Avoidance, Minimization, and/or Mitigation Measures

The following SCAQMD and Caltrans standard measures are required to avoid and/or minimize Project impacts to air quality during construction.

AQ-1 **SCAQMD Rule 403.** During clearing, grading, earthmoving, or excavation operations, excessive fugitive dust emissions will be controlled by regular watering or other dust preventive measures using the following procedures, as specified in the South Coast Air Quality Management District (SCAQMD) Rule 403. All material excavated or graded will be sufficiently watered to prevent excessive amounts of

dust. Watering will occur at least twice daily with complete coverage, preferably in the late morning and after work is done for the day. All material transported on site or off site will be either sufficiently watered or securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earth moving, or excavation operations will be minimized so as to prevent excessive amounts of dust. These control techniques will be indicated in Project specifications. Visible dust beyond the property line emanating from the Project will be prevented to the maximum extent feasible.

AQ-2 **Ozone Precursors.** Project grading plans will show the duration of construction. Ozone (O_3) precursor emissions from construction equipment vehicles will be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications.

AQ-3 **State Vehicle Code Section 23117.** All trucks that are to haul excavated or graded material on site will comply with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4), as amended, regarding the prevention of such material spilling onto public streets and roads.

AQ-4 **Caltrans Standard Specifications.** Most of the construction impacts to air quality are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control, will reduce any air quality impacts resulting from construction activities. The contractor will adhere to California Department of Transportation (Caltrans) Standard Specifications for Construction (Sections 14.9-02 and 14-9.03), specifically including:

a. Section 14-9.02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.

b. Section 14-9.03 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are described in Section 18.

c. Water or dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a "no visible dust" criterion either at the point of emissions or at the right-of-way line depending on local regulations.

d. Soil binder will be spread on any unpaved roads used for construction purposes, and on all project construction parking areas.

e. Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions.

f. Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by CA Code of Regulations Title 17, Section 93114.

g. A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.

h. Equipment and materials storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly.

i. ESA (Environmentally Sensitive Area)-like areas or their equivalent will be established near sensitive air receptors. Within these areas construction activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible.

j. Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used.

k. All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the

material to the top of the truck) will be provided to minimize emission of dust (particulate matter) during transportation.

l. Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to decrease particulate matter.

m. To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.

n. Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown particulate in the area. Be aware that certain methods of mulch placement, such as straw blowing, may themselves cause dust and visible emission issues and may need to use controls such as dampened straw.

AQ-5 **Construction Equipment Staging Areas.** Construction equipment staging areas will be located at least 200 feet from sensitive receptors.

2.12.5 Climate Change

Climate change is analyzed at the end of this chapter. Neither the United States Environmental Protection Agency (U.S. EPA) nor Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will aid decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders on climate change, the issue is addressed in a separate California Environmental Quality Act (CEQA) discussion at the end of this chapter and may be used to inform the National Environmental Policy Act (NEPA) decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with

efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

2.13 Noise

2.13.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

2.13.1.1 California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The CEQA noise analysis is included at the end of this section.

2.13.1.2 National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and Caltrans, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). Table 2.13.A lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.13.B lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

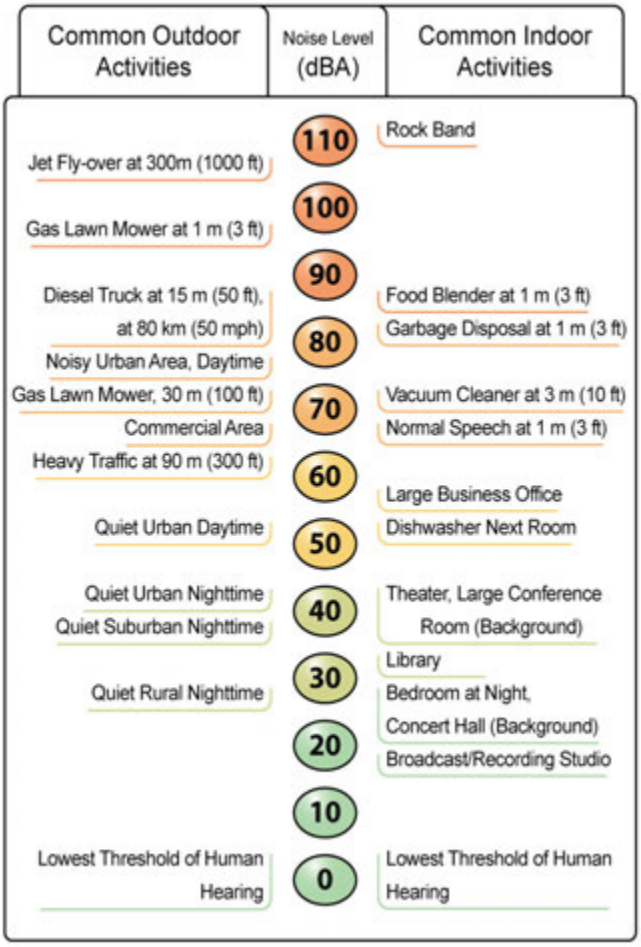
According to Caltrans *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*, *May 2011*, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project

Table 2.13.A Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activities
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.

Table 2.13.B Noise Levels of Common Activities



approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Caltrans *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other

considerations include topography, access requirements, other noise sources and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence.

2.13.2 Affected Environment

This section is based on the *Noise Study Report* (NSR) (February 2012) and the *Noise Abatement Decision Report* (NADR) (May 2012) prepared for Alternatives 3 and 6 as well as the Supplementary NSR (September 2013), the Supplementary NADR (October 2013) for Modified Alternative 7, and the *Reconstruction of the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project Sound Barrier at the I-215 Southbound Off-Ramp Memorandum* (November 2013).

2.13.2.1 Surrounding Land Use and Sensitive Receivers

Existing land uses in the Project area include single-family and multifamily residences; two mobile home parks; a recreational vehicle (RV) park (Terrace Village RV Park); a school; a fast-food restaurant with an outdoor eating area; a utility facility; office, commercial, and light industrial uses; and undeveloped land.

A total of 144 receiver locations, shown in Figure 2.13.1, were selected to represent noise-sensitive land uses in the Project vicinity. The receiver locations with outdoor active use areas include existing residences, Grand Terrace Elementary School, Grand Terrace Mobile Home Park, Grand Royale Mobile Estates, Terrace Village RV Park, light industrial uses, office uses, commercial uses, a restaurant, and utility uses.

2.13.2.2 Existing Noise Levels

The primary source of noise in the Project area is traffic on I-215 and Barton Road. As detailed in the NSR, noise measurements were conducted to calibrate the noise model and to predict the noise levels at all 144 modeled receiver locations in the Project area. The modeled receiver locations are shown in Figure 2.13.1. Table 2.13.C shows the existing traffic noise levels at the modeled receiver locations.

Interior and exterior noise level measurements were conducted at Grand Terrace Elementary School to determine the existing exterior-to-interior noise level reduction. The classroom building closest to I-215 was evaluated to ensure that the interior noise standard of 52 A-weighted decibels (dBA) equivalent continuous noise level (L_{eq}) NAC is preserved. Table 2.13.D shows the results of the exterior and interior noise level measurements and the existing exterior-to-interior noise level reduction.

LEGEND

- Existing Sound Barriers
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Monitoring Locations
- Modeled Receiver Locations
- 24-hour Noise Monitoring Location
- Exterior/Interior Noise Monitoring Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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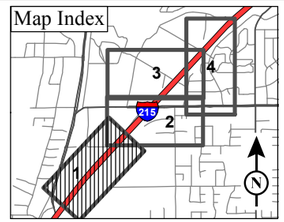

FIGURE 2.13.1
Sheet 1 of 4

I-215/Barton Road Interchange Improvement Project

Monitoring and Receiver Locations

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LEGEND

- Existing Sound Barriers
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Monitoring Locations
- Modeled Receiver Locations
- 24-hour Noise Monitoring Location
- Exterior/Interior Noise Monitoring Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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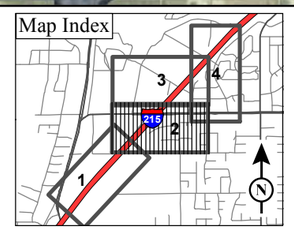

FIGURE 2.13.1
Sheet 2 of 4

I-215/Barton Road Interchange Improvement Project

Monitoring and Receiver Locations

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LEGEND

- Existing Sound Barriers
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Monitoring Locations
- Modeled Receiver Locations
- 24-hour Noise Monitoring Location
- Exterior/Interior Noise Monitoring Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200 FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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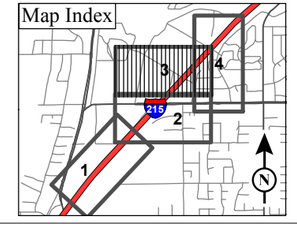

FIGURE 2.13.1

Sheet 3 of 4

I-215/Barton Road Interchange Improvement Project

Monitoring and Receiver Locations

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LEGEND

- Existing Sound Barriers
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Monitoring Locations
- Modeled Receiver Locations
- 24-hour Noise Monitoring Location
- Exterior/Interior Noise Monitoring Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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Map Index

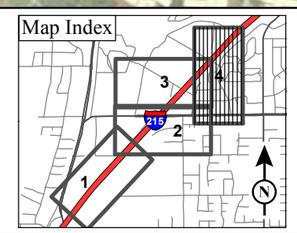

FIGURE 2.13.1
Sheet 4 of 4

I-215/Barton Road Interchange Improvement Project

Monitoring and Receiver Locations

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Table 2.13.C Existing Noise Levels

Receiver No.	Location	Type of Land Use	No. of Units Represented	Noise Abatement Category (NAC)	Adjusted Existing Noise Level[1] (dBA L_{eq})
R-1	De Berry Street	Residential	3	B(67)	65
R-2	De Berry Street	Residential	1	B(67)	53
R-3	Rene Lane	Residential	1	B(67)	51
R-4	De Berry Street	Residential	1	B(67)	51
R-5	De Berry Street	Residential	1	B(67)	51
R-6	Rene Lane	Residential	1	B(67)	50
R-7	Rene Lane	Residential	1	B(67)	49
R-8	Rene Lane	Residential	1	B(67)	50
R-9	Rene Lane	Residential	1	B(67)	52
R-10	Rene Lane	Residential	2	B(67)	56
R-11	Michigan Street	Residential	1	B(67)	55
R-12	Michigan Street	Residential	1	B(67)	54
R-13	Michigan Street	Residential	1	B(67)	55
R-14	Michigan Street	Residential	1	B(67)	49
R-15	Michigan Street	Residential	1	B(67)	47
R-16	Michigan Street	Residential	1	B(67)	49
R-17	Barton Road	Residential	3	B(67)	59
R-18	Barton Road	Residential	1	B(67)	58
R-19	Barton Road	Residential	2	B(67)	61
R-20	Barton Road	Residential	2	B(67)	56
R-21	Barton Road	Residential	2	B(67)	58
R-22	Grand Terrace Elementary School	School	1[2]	C(67)	57
R-23	Grand Terrace Elementary School	School	3[2]	C(67)	**68**[3]
R-24	Grand Terrace Elementary School	School	3[2]	C(67)	**70**
R-25	Grand Terrace Elementary School	School	3[2]	C(67)	**73**
R-26	Vivienda Avenue	Residential	1	B(67)	61
R-27	Vivienda Court	Residential	1	B(67)	**70**
R-28	Vivienda Court	Residential	1	B(67)	**74**
R-29	Vivienda Avenue	Residential	2	B(67)	**69**
R-30	Vivienda Avenue	Residential	2	B(67)	**68**
R-31	Vivienda Avenue	Residential	2	B(67)	**67**
R-32	Vivienda Avenue	Residential	1	B(67)	**69**
R-33	Vivienda Avenue	Residential	1	B(67)	62
R-34	Pascal Avenue	Residential	2	B(67)	64
R-35	Pascal Avenue	Residential	2	B(67)	**74**
R-36	Pascal Avenue	Residential	3	B(67)	53
R-37	Pascal Avenue	Residential	2	B(67)	55
R-38	Victoria Street	Residential	2	B(67)	56
R-39	Victoria Street	Residential	1	B(67)	**73**
R-40	Victoria Street	Residential	1	B(67)	**69**
R-41	Canal Street	Residential	1	B(67)	**66**
R-42	Newport Avenue	Residential	1	B(67)	**68**
R-43	Barton Road	Residential	1	B(67)	56
R-44	Vivienda Avenue	Residential	1	B(67)	56
R-45	McClarren Street	Residential	3	B(67)	55
R-46	Carhart Avenue	Residential	1	B(67)	57
R-47	Carhart Avenue	Residential	1	B(67)	53
R-48	Carhart Avenue	Residential	2	B(67)	57
R-49	Vivienda Avenue	Residential	2	B(67)	52
R-50	Pascal Avenue	Residential	2	B(67)	57
R-51	Pascal Avenue	Residential	3	B(67)	55
R-52	Canal Street	Apartment	6	B(67)	50
R-53	Canal Street	Apartment	8	B(67)	55
R-54	Canal Street	Apartment	6	B(67)	57
R-55	Canal Street	Apartment	8	B(67)	52

Table 2.13.C Existing Noise Levels (Continued)

Receiver No.	Location	Type of Land Use	No. of Units Represented	Noise Abatement Category (NAC)	Adjusted Existing Noise Level[1] (dBA L_{eq})
R-56	Canal Street	Apartment	8	B(67)	55
R-57	Canal Street	Apartment	8	B(67)	54
R-58	Canal Street	Apartment	8	B(67)	54
R-59	Canal Street	Residential	8	B(67)	54
R-60	Grand Terrace Road	RV Park	1	B(67)	60
R-61	Grand Terrace Road	RV Park	9	B(67)	60
R-62	Grand Terrace Road	RV Park	8	B(67)	60
R-63	Grand Terrace Road	RV Park	8	B(67)	60
R-64	Grand Terrace Road	RV Park	8	B(67)	59
R-65	Grand Terrace Road	RV Park	8	B(67)	59
R-66	Grand Terrace Road	RV Park	9	B(67)	59
R-67	Vivienda Avenue	Residential	1	B(67)	**69**
R-68	La Crosse Avenue	Residential	1	B(67)	**69**
R-69	La Crosse Avenue	Residential	1	B(67)	**70**
R-70	Grand Terrace Road	Mobile Home	4	B(67)	62
R-71	Grand Terrace Road	Mobile Home	3	B(67)	60
R-72	Grand Terrace Road	Mobile Home	2	B(67)	60
R-73	Grand Terrace Road	Mobile Home	4	B(67)	59
R-74	Grand Terrace Road	Mobile Home	2	B(67)	60
R-75	Grand Terrace Road	Mobile Home	4	B(67)	59
R-76	Grand Terrace Road	Mobile Home	4	B(67)	59
R-77	Grand Terrace Road	Mobile Home	4	B(67)	63
R-78	Grand Terrace Road	Mobile Home	4	B(67)	60
R-79	Grand Terrace Road	Mobile Home	3	B(67)	60
R-80	Grand Terrace Road	Mobile Home	4	B(67)	60
R-81	Grand Terrace Road	Mobile Home	3	B(67)	59
R-82	Grand Terrace Road	Mobile Home	3	B(67)	59
R-83	Grand Terrace Road	Mobile Home	2	B(67)	63
R-84	Grand Terrace Road	Mobile Home	3	B(67)	60
R-85	Grand Terrace Road	Mobile Home	3	B(67)	61
R-86	Grand Terrace Road	Mobile Home	4	B(67)	60
R-87	Grand Terrace Road	Mobile Home	1	B(67)	60
R-88	Grand Terrace Road	Mobile Home	3	B(67)	59
R-89	Grand Terrace Road	Mobile Home	1	B(67)	59
R-90	Vivienda Avenue	Residential	1	B(67)	61
R-91	Vivienda Avenue	Residential	1	B(67)	60
R-92	Vivienda Avenue	Residential	1	B(67)	60
R-93	Grand Terrace Road	Residential	1	B(67)	58
R-94	Grand Terrace Road	Residential	1	B(67)	58
R-95	Grand Terrace Road	Residential	1	B(67)	58
R-96	Grand Terrace Road	Residential	1	B(67)	58
R-97	Grand Terrace Road	Residential	1	B(67)	58
R-98	Grand Terrace Road	Residential	1	B(67)	58
R-99	Grand Terrace Road	Residential	2	B(67)	58
R-100	Grand Terrace Road	Residential	2	B(67)	58
R-101	Grand Terrace Road	Residential	1	B(67)	59
R-102	Grand Terrace Road	Residential	1	B(67)	59
R-103	Grand Terrace Road	Residential	1	B(67)	59
R-104	Grand Terrace Road	Residential	1	B(67)	59
R-105	Grand Terrace Road	Residential	1	B(67)	59
R-106	Grand Terrace Road	Residential	1	B(67)	59
R-107	Grand Terrace Road	Residential	1	B(67)	62
R-108	Vivienda Avenue	Residential	1	B(67)	60
R-109	Vivienda Avenue	Residential	1	B(67)	62
R-110	Vivienda Avenue	Residential	2	B(67)	63
R-111	Vivienda Avenue	Residential	1	B(67)	65
R-112	Vivienda Avenue	Residential	1	B(67)	**70**
R-113	Newport Avenue	Mobile Home	2	B(67)	63

Table 2.13.C Existing Noise Levels (Continued)

Receiver No.	Location	Type of Land Use	No. of Units Represented	Noise Abatement Category (NAC)	Adjusted Existing Noise Level[1] (dBA L_{eq})
R-114	Newport Avenue	Mobile Home	2	B(67)	62
R-115	Newport Avenue	Mobile Home	2	B(67)	**66**
R-116	Newport Avenue	Mobile Home	2	B(67)	**66**
R-117	Newport Avenue	Mobile Home	2	B(67)	63
R-118	Newport Avenue	Mobile Home	2	B(67)	60
R-119	Newport Avenue	Mobile Home	2	B(67)	60
R-120	Newport Avenue	Mobile Home	1	B(67)	59
R-121	Newport Avenue	Mobile Home	5	B(67)	64
R-122	Newport Avenue	Mobile Home	2	B(67)	63
R-123	Newport Avenue	Mobile Home	1	B(67)	64
R-124	Newport Avenue	Mobile Home	2	B(67)	61
R-125	Newport Avenue	Mobile Home	4	B(67)	60
R-126	Newport Avenue	Mobile Home	3	B(67)	60
R-127	Newport Avenue	Mobile Home	4	B(67)	59
R-128	Newport Avenue	Mobile Home	3	B(67)	59
R-129	Newport Avenue	Mobile Home	4	B(67)	59
R-130	Newport Avenue	Mobile Home	3	B(67)	59
R-131	Taylor Street	Light Industrial	1	F	68
R-132	S. Iowa Avenue	Commercial	1	F	70
R-133	De Berry Street	Light Industrial	1	F	73
R-134	De Berry Street	Vacant Land	1	G	69
R-135	De Berry Street	Light Industrial	1	F	72
R-136	La Crosse Avenue	Light Industrial	1	F	72
R-137	Commerce Way	Light Industrial	1	F	63
R-138	Michigan Avenue	Light Industrial	1	F	53
R-139	Barton Road	Light Industrial	1	F	58
R-140	Barton Road	Light Industrial	1	F	61
R-141	Barton Road	Commercial	1	F	61
R-142	Barton Road	Commercial	1	F	66
R-143	Barton Road	Restaurant	1	E(72)	66
R-144	Newport Avenue	Utilities	1	F	60

Source: *Noise Study Report* (February 2012).

[1] The adjusted noise level is the result of the existing traffic noise modeling, which is based on measured existing noise levels.

[2] 100 ft frontage units were used to calculate the number of units represented for nonresidential land uses per the Caltrans Traffic Noise Analysis Protocol (May 2011).

[3] Numbers in **bold** represent noise levels that approach or exceed the NAC for that specific land use.

2.13.3 Environmental Consequences

The I-215/Barton Road Interchange Improvement Project is considered a Type 1 Project because it would use federal aid to improve the existing Interstate 215 (I-215)/ Barton Road interchange by adding a through lane on Barton Road and substantially altering the vertical and horizontal alignment of the Barton Road interchange. A noise analysis is required for all Type 1 Projects. Therefore, noise impacts of the Build Alternatives are analyzed below.

Table 2.13.D Exterior/Interior Noise Monitoring Results

Receiver	Exterior (dBA L_{eq})	Interior (dBA L_{eq})	Exterior to Interior Noise Level Reduction	Land Use Description
EI-1	64.9	42.7	22.2	12066 Vivienda Avenue; Grand Terrace Elementary School; classroom building closest to the I-215

Source: *Noise Study Report* (February 2012) and the *Supplemental Noise Study Report* (September 2013)..

Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Because the No Build Alternative would not result in construction activities in the Project area, no temporary noise impacts would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Two types of short-term noise impacts would occur during Project construction. The first type would be from construction crew commutes and the transport of construction equipment and materials to the Project site and would incrementally raise noise levels on access roads leading to the site. The pieces of heavy equipment for grading and construction activities will be moved on site, will remain for the duration of each construction phase, and will not add to the daily traffic volume in the Project vicinity. A high single-event noise exposure potential at a maximum level of 87 maximum instantaneous sound level (L_{max}) measured in dBA from trucks passing at 50 feet (ft) will exist. However, the projected construction traffic will be minimal when compared to existing traffic volumes on I-215 and other affected streets, and its associated long-term noise level change will not be perceptible. Therefore, short-term construction-related worker commutes and equipment transport noise impacts would be less than substantial.

The second type of short-term noise impact is related to noise generated during roadway construction. Construction is performed in distinct steps, each of which has its own mix of equipment and consequently its own noise characteristics. These various sequential phases would change the character of the noise generated and the noise levels along the Project alignment as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 2.13.E lists typical construction equipment noise

Table 2.13.E Typical Construction Equipment Noise Levels

Type of Equipment	Range of Maximum Sound Levels (dBA L_{max} at 50 ft)	Suggested Maximum Sound Levels for Analysis (dBA L_{max} at 50 ft)
Pile drivers	81–96	93
Rock drills	83–99	96
Jackhammers	75–85	82
Pneumatic tools	78–88	85
Pumps	74–84	80
Scrapers	83–91	87
Haul trucks	83–94	88
Cranes	79–86	82
Portable generators	71–87	80
Rollers	75–82	80
Dozers	77–90	85
Tractors	77–82	80
Front-end loaders	77–90	86
Hydraulic backhoe	81–90	86
Hydraulic excavators	81–90	86
Graders	79–89	86
Air compressors	76–89	86
Trucks	81–87	86

Source: *Noise Study Report* (February 2012) and the *Supplemental Noise Study Report* (September 2013).

levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 ft between the equipment and a noise receiver.

Typical noise levels at 50 ft from an active construction area range up to 91 dBA L_{max} during the noisiest construction phases. The site preparation phase, which includes grading and paving, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes machinery such as graders, scrapers, excavators, bulldozers, compactors, and front loaders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings.

Noise associated with the use of construction equipment is estimated between 79 and 89 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. As seen in Table 2.13.E, the maximum noise level generated by each earthmover is assumed to be approximately 86 dBA L_{max} at 50 ft from the earthmover in operation. Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft.

The maximum noise level generated by water trucks and pickup trucks is approximately 86 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound source with equal strength increases the noise level by 3 dBA. Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 91 dBA L_{max} (at a distance of 50 ft from an active construction area).

In addition to standard construction equipment, the Project may require the use of pile drivers. As shown in Table 2.13.E, pile driving generates noise levels of approximately 93 dBA L_{max} at 50 ft. If pile driving is conducted concurrently with site preparation, the construction site could potentially generate noise levels of 95 dBA L_{max} at a distance of 50 ft.

The closest sensitive receiver locations are located 50 ft from the Project construction areas. Therefore, these receiver locations may be subject to short-term noise reaching 95 dBA L_{max} generated by construction activities along the Project alignment. Measures N-1 and N-2 require compliance with the construction hours specified in the City of Colton Bid and Contract template, and the City of Grand Terrace Municipal Code would be required for work within each City's boundaries, respectively, as well as adherence to the California Department of Transportation (Caltrans) Standard Special Provisions (SSP) to minimize construction noise for work within State right of way. With compliance with Measures N-1 and N-2, the short-term noise impacts during Project construction would not be substantial.

Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. Potential long-term noise impacts from the I-215 Bi-County HOV Lane Gap Closure Project would be solely from traffic noise due to the freeway widening, which would increase capacity on the freeway in the Project area. Two sound barriers would be constructed: (1) along State right of way adjacent to Grand Terrace Elementary School; and (2) along State right of way, adjacent to Grand Royale Mobile Estates on Newport Avenue. Table 2.13.F shows the predicted noise levels for the No Build Alternative with and without the I-215 Bi-County HOV Lane Gap Closure Project sound barriers. As seen in the table, the I-215 Bi-County HOV Lane Gap Closure

Table 2.13.F Alternative 1 Predicted Noise Levels (2040) (dBA L_{eq})

Receptor No.	Location	Existing Noise Levels[1]	Future No Build (Without Sound Barriers)[2]	Future No Build (With Sound Barriers)[3]	Noise Level Reduction[4]
R-1	De Berry Street	65	**66**[4]	**66**	0
R-2	Barton Road	53	55	55	0
R-3	Vivienda Avenue	51	53	53	0
R-4	Vivienda Avenue	51	54	54	0
R-5	Vivienda Avenue	51	53	53	0
R-6	Vivienda Avenue	50	53	53	0
R-7	Vivienda Court	49	53	53	0
R-8	Vivienda Court	50	54	54	0
R-9	Vivienda Avenue	52	57	57	0
R-10	Vivienda Avenue	56	62	62	0
R-11	Vivienda Avenue	55	60	60	0
R-12	Vivienda Avenue	54	59	59	0
R-13	Vivienda Avenue	55	60	60	0
R-14	Pascal Avenue	49	54	53	1
R-15	Pascal Avenue	47	51	51	0
R-16	Pascal Avenue	49	53	53	0
R-17	Pascal Avenue	59	62	62	0
R-18	Victoria Street	58	61	60	1
R-19	Carhart Avenue	61	64	64	0
R-20	Carhart Avenue	56	59	58	1
R-21	Carhart Avenue	58	61	60	1
R-22	Grand Terrace Elementary School	57	65	64	1
R-23	Grand Terrace Elementary School	**68**	**69**	60	9
R-24	Grand Terrace Elementary School	**70**	**71**	60	11
R-25	Grand Terrace Elementary School	**73**	**74**	61	13
R-26	Grand Terrace Road	61	63	59	4
R-27	Grand Terrace Road	**70**	**71**	61	10
R-28	Grand Terrace Road	**74**	**75**	62	13
R-29	Vivienda Avenue	**69**	**70**	61	9
R-30	La Crosse Avenue	**68**	**69**	62	7
R-31	Grand Terrace Road	**67**	**68**	62	6
R-32	Grand Terrace Road	**69**	**70**	63	7
R-33	Grand Terrace Road	62	63	56	7
R-34	Grand Terrace Road	64	65	60	5
R-35	Grand Terrace Road	**74**	**75**	63	12
R-36	Vivienda Avenue	53	54	49	5
R-37	Vivienda Avenue	55	55	50	5
R-38	Vivienda Avenue	56	56	52	4
R-39	Vivienda Avenue	**73**	**73**	62	11
R-40	Newport Avenue	**69**	**69**	60	9
R-41	Newport Avenue	**66**	**66**	59	7
R-42	Newport Avenue	**68**	**69**	62	7
R-43	Newport Avenue	56	62	61	1
R-44	Newport Avenue	56	60	58	2
R-45	Newport Avenue	55	59	56	3
R-46	Newport Avenue	57	59	54	5
R-47	Newport Avenue	53	54	51	3
R-48	Newport Avenue	57	58	53	5
R-49	Newport Avenue	52	53	50	3
R-50	Newport Avenue	57	58	53	5
R-51	Newport Avenue	55	56	51	5
R-52	De Berry Street	50	51	48	3
R-53	Barton Road	55	56	51	5
R-54	Vivienda Avenue	57	58	54	4
R-55	Vivienda Avenue	52	54	52	2
R-56	Vivienda Avenue	55	57	56	1

Table 2.13.F Alternative 1 Predicted Noise Levels (2040) (dBA L_{eq}) (Continued)

Receptor No.	Location	Existing Noise Levels[1]	Future No Build (Without Sound Barriers)[2]	Future No Build (With Sound Barriers)[3]	Noise Level Reduction[4]
R-57	Vivienda Avenue	54	55	55	0
R-58	Vivienda Court	54	55	55	0
R-59	Vivienda Court	54	55	55	0
R-60	Vivienda Avenue	60	61	61	0
R-61	Vivienda Avenue	60	60	60	0
R-62	Vivienda Avenue	60	60	60	0
R-63	Vivienda Avenue	60	60	60	0
R-64	Vivienda Avenue	59	60	60	0
R-65	Pascal Avenue	59	60	60	0
R-66	Pascal Avenue	59	60	60	0
R-67	Pascal Avenue	**69**	**70**	61	9
R-68	Pascal Avenue	**69**	**70**	62	8
R-69	Victoria Street	**70**	**71**	62	9
R-70	Carhart Avenue	62	63	63	0
R-71	Carhart Avenue	60	61	61	0
R-72	Carhart Avenue	60	61	60	1
R-73	Vivienda Avenue	59	60	60	0
R-74	Pascal Avenue	60	60	59	1
R-75	Grand Terrace Road	59	59	59	0
R-76	Grand Terrace Road	59	60	60	0
R-77	Grand Terrace Road	63	64	64	0
R-78	Grand Terrace Road	60	61	61	0
R-79	Grand Terrace Road	60	60	60	0
R-80	Vivienda Avenue	60	60	60	0
R-81	La Crosse Avenue	59	60	60	0
R-82	Grand Terrace Road	59	60	60	0
R-83	Grand Terrace Road	63	**66**	**66**	0
R-84	Grand Terrace Road	60	63	63	0
R-85	Grand Terrace Road	61	61	61	0
R-86	Grand Terrace Road	60	62	62	0
R-87	Vivienda Avenue	60	61	61	0
R-88	Vivienda Avenue	59	61	61	0
R-89	Vivienda Avenue	59	61	61	0
R-90	Vivienda Avenue	61	62	59	3
R-91	Newport Avenue	60	61	59	2
R-92	Newport Avenue	60	60	59	1
R-93	Newport Avenue	58	58	58	0
R-94	Newport Avenue	58	58	58	0
R-95	Newport Avenue	58	58	58	0
R-96	Newport Avenue	58	58	58	0
R-97	Newport Avenue	58	58	58	0
R-98	Newport Avenue	58	58	58	0
R-99	Newport Avenue	58	58	58	0
R-100	Newport Avenue	58	59	59	0
R-101	Newport Avenue	59	59	59	0
R-102	Newport Avenue	59	59	59	0
R-103	De Berry Street	59	59	59	0
R-104	Barton Road	59	59	59	0
R-105	Vivienda Avenue	59	59	59	0
R-106	Vivienda Avenue	59	60	60	0
R-107	Vivienda Avenue	62	63	63	0
R-108	Vivienda Avenue	60	61	59	2
R-109	Vivienda Court	62	63	59	4
R-110	Vivienda Court	63	64	59	5
R-111	Vivienda Avenue	65	**66**	60	6
R-112	Vivienda Avenue	**70**	**71**	61	10
R-113	Vivienda Avenue	63	64	60	4
R-114	Vivienda Avenue	62	63	59	4

Table 2.13.F Alternative 1 Predicted Noise Levels (2040) (dBA L_{eq}) (Continued)

Receptor No.	Location	Existing Noise Levels[1]	Future No Build (Without Sound Barriers)[2]	Future No Build (With Sound Barriers)[3]	Noise Level Reduction[4]
R-115	Vivienda Avenue	**66**	**66**	60	6
R-116	Pascal Avenue	**66**	**66**	60	6
R-117	Pascal Avenue	63	63	60	3
R-118	Pascal Avenue	60	60	59	1
R-119	Pascal Avenue	60	60	59	1
R-120	Victoria Street	59	59	59	0
R-121	Carhart Avenue	64	64	59	5
R-122	Carhart Avenue	63	64	59	5
R-123	Carhart Avenue	64	65	60	5
R-124	Vivienda Avenue	61	62	59	3
R-125	Pascal Avenue	60	60	59	1
R-126	Grand Terrace Road	60	60	59	1
R-127	Grand Terrace Road	59	59	58	1
R-128	Grand Terrace Road	59	59	58	1
R-129	Grand Terrace Road	59	59	58	1
R-130	Grand Terrace Road	59	59	59	0
R-131	Vivienda Avenue	68	70	70	0
R-132	La Crosse Avenue	70	71	71	0
R-133	Grand Terrace Road	73	74	74	0
R-134	Grand Terrace Road	69	70	70	0
R-135	Grand Terrace Road	72	74	74	0
R-136	Grand Terrace Road	72	73	73	0
R-137	Grand Terrace Road	63	64	64	0
R-138	Vivienda Avenue	53	55	55	0
R-139	Vivienda Avenue	58	60	60	0
R-140	Vivienda Avenue	61	62	62	0
R-141	Vivienda Avenue	61	62	62	0
R-142	Newport Avenue	66	70	70	0
R-143	Newport Avenue	66	70	70	0
R-144	Newport Avenue	60	60	59	1

Sources: *Noise Study Report* (February 2012), LSA Associates, Inc. (September 2013).

[1] The existing traffic noise levels were calculated using short-term noise levels measurement, concurrent traffic counts, and the 24-hour noise level measurement.

[2] I-215/Barton Road Interchange Future No Build without sound barriers from the I-215 Bi-County HOV Lane Gap Closure Project.

[3] I-215/Barton Road Interchange Future No Build with sound barriers from the I-215 Bi-County HOV Lane Gap Closure Project.

[4] Numbers in **bold** represent noise levels that approach or exceed the NAC.

[5] Change in noise level from the I-215 Bi-County HOV Lane Gap Closure Project sound barriers.

Project sound barriers would reduce noise levels at affected receivers within the I-215 Barton Road Interchange Improvement Project area from 0 to 13 dBA in 2040.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Potential long-term noise impacts associated with Project operations are solely from traffic noise. Traffic noise impacts occur when either of the following occurs: (1) if the traffic noise level at a sensitive receiver location is predicted to "approach or exceed" it's NAC, or (2) if the predicted traffic noise level is 12 dBA or more over its

corresponding modeled existing noise level at the sensitive receiver locations analyzed. When traffic noise impacts occur, noise abatement measures must be considered.

Traffic noise was evaluated for the worst-case traffic condition. Future traffic noise levels for all three Build Alternatives (Alternatives 3, 6, and Modified Alternative 7) at up to 144 receiver locations were determined with existing walls using the worst-case traffic operations (prior to speed degradation) or the future 2040 peak-hour traffic volumes obtained from the Traffic Operations Analysis (December 2011) and Roundabout Analyses (August 2013), whichever was lower, because traffic noise is generally loudest when vehicles on a given roadway travel at free-flowing traffic conditions. Therefore, these worst-case traffic volume assumptions are based on the maximum number of vehicles that can typically travel in a given lane while still resulting in free-flowing traffic conditions.

Modeling of the future traffic noise levels was based on existing walls and topography. Even though the I-215 Bi-County HOV Lane Gap Closure Project will construct two sound barriers in the Project area, the noise modeling for future conditions did not assume construction of these sound barriers, in order to determine the worst-case noise levels for each of the Build Alternatives (refer to the "Predicted Noise Levels Without Project" and "With Project" columns in Tables 2.13.G, 2.13.I, and 2.13.J, later in this section). Sound barriers were independently analyzed for receivers that would approach or exceed the NAC in 2040 (design year for the I-215/ Barton Road Interchange Improvement Project).

As shown in Tables 2.13.A and 2.13.C, Receivers R-131 through R-142 and R-144 do not have an NAC; these receivers are included to report the highest expected noise levels in these areas.

Alternative 3 (Partial Cloverleaf Interchange)

Long-Term Exterior Noise Impacts

The existing and future-worst-case traffic noise level results for Alternative 3 are shown in Table 2.13.G; 16 receivers would approach or exceed the NAC under Alternative 3.

The following receiver locations would be or would continue to be exposed to noise levels that approach or exceed the NAC under Activity Categories B, C, D, and E under Alternative 3:

Table 2.13.G Alternative 3 Predicted Noise Levels (2040) (dBA L_{eq})

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
1a & 1b	R-1	De Berry Street	65	**66**[2]	**67**	1	2	Yes	**66**	**66**	65	63	62[3]	61	No
	R-2	De Berry Street	53	55	58	3	5	No	-	-	-	-	-	-	-
	R-3	Rene Lane	51	53	56	3	5	No	-	-	-	-	-	-	-
	R-4	De Berry Street	51	54	56	2	5	No	-	-	-	-	-	-	-
	R-5	De Berry Street	51	53	55	2	4	No	-	-	-	-	-	-	-
	R-6	Rene Lane	50	53	56	3	6	No	-	-	-	-	-	-	-
	R-7	Rene Lane	49	53	55	2	6	No	-	-	-	-	-	-	-
	R-8	Rene Lane	50	54	54	0	4	No	-	-	-	-	-	-	-
	R-9	Rene Lane	52	57	54	-3	2	No	-	-	-	-	-	-	-
	R-10	Rene Lane	56	62	54	-8	-2	No	-	-	-	-	-	-	-
	R-11	Michigan Street	55	60	54	-6	-1	No	-	-	-	-	-	-	-
	R-12	Michigan Street	54	59	56	-3	2	No	-	-	-	-	-	-	-
	R-13	Michigan Street	55	60	60	0	5	No	-	-	-	-	-	-	-
	R-14	Michigan Street	49	54	53	-1	4	No	-	-	-	-	-	-	-
	R-15	Michigan Street	47	51	53	2	6	No	-	-	-	-	-	-	-
	R-16	Michigan Street	49	53	58	5	9	No	-	-	-	-	-	-	-
	R-17	Barton Road	59	62	65	3	6	No	-	-	-	-	-	-	-
	R-18	Barton Road	58	61	63	2	5	No	-	-	-	-	-	-	-
	R-19	Barton Road	61	64	**66**	2	5	NF[4]	-	-	-	-	-	-	-
	R-20	Barton Road	56	59	61	2	5	No	-	-	-	-	-	-	-
	R-21	Barton Road	58	61	63	2	5	No	-	-	-	-	-	-	-
	R-22	Grand Terrace Elementary School	57	65	65	0	8	No	--[5]	64	64	64	64	NP[6]	Yes (14 ft)[7]
2a & 2b	R-23	Grand Terrace Elementary School	**68**	**69**	**69**	0	1	Yes	64	63	62	61	61	NP	Yes (14 ft)
	R-24	Grand Terrace Elementary School	**70**	**71**	**70**	-1	0	Yes	64	63	62	61	60	NP	Yes (14 ft)
	R-25	Grand Terrace Elementary School	**73**	**74**	**75**	1	2	Yes	**67**	65	63	62	61	NP	Yes (14 ft)
	R-26	Vivienda Avenue	61	63	64	1	3	No	62	61	61	60	60	NP	Yes (14 ft)

Table 2.13.G Alternative 3 Predicted Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
2a & 2b	R-27	Vivienda Court	**70**	**71**	**71**	0	1	Yes	**66**	65	64	62	61	NP	Yes (14 ft)
	R-28	Vivienda Court	**74**	**75**	**75**	0	1	Yes	**69**	**67**	65	64	63	NP	Yes (14 ft)
	R-29	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	**66**	65	64	62	61	NP	Yes (14 ft)
	R-30	Vivienda Avenue	**68**	**69**	**69**	0	1	Yes	**67**	**67**	**66**	65	64	NP	Yes (14 ft)
	R-31	Vivienda Avenue	**67**	**68**	**68**	0	1	Yes	**67**	65	64	63	62	NP	Yes (14 ft)
	R-32	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	--[5]	**67**	**66**	65	63	NP	Yes (14 ft)
	R-33	Vivienda Avenue	62	63	63	0	1	No	--[5]	60	59	58	57	NP	--
	R-43	Barton Road	56	62	64	2	8	No	--	--	--	--	--	--	--
	R-44	Vivienda Avenue	56	60	62	2	6	No	--	--	--	--	--	--	--
	R-45	McClarren Street	55	59	60	1	5	No	--	--	--	--	--	--	--
2a & 2b	R-46	Carhart Avenue	57	59	59	0	2	No	56	56	56	55	54	NP	Yes (14 ft)
	R-47	Carhart Avenue	53	54	54	0	1	No	53	53	53	52	52	NP	Yes (14 ft)
	R-48	Carhart Avenue	57	58	58	0	1	No	56	56	55	54	53	NP	Yes (14 ft)
	R-49	Vivienda Avenue	52	53	53	0	1	No	52	52	52	51	50	NP	Yes (14 ft)
	R-50	Pascal Avenue	57	58	58	0	1	No	57	56	56	55	54	NP	Yes (14 ft)
	R-51	Pascal Avenue	55	56	56	0	1	No	54	54	54	53	52	NP	Yes (14 ft)
	R-60	Grand Terrace Road	60	61	--[8]	--	--	--	--	--	--	--	--	--	--
	R-61	Grand Terrace Road	60	60	65	5	5	No	--[5]	--[5]	--[5]	--[5]	--	--	--
	R-62	Grand Terrace Road	60	60	63	3	3	No	--[5]	--[5]	--[5]	--[5]	--	--	--
	R-63	Grand Terrace Road	60	60	62	2	2	No	--[5]	--[5]	--[5]	--[5]	--	--	--
	R-64	Grand Terrace Road	59	60	61	1	2	No	--[5]	--[5]	--[5]	--[5]	--	--	--
	R-65	Grand Terrace Road	59	60	61	1	2	No	--[5]	--[5]	--[5]	--[5]	--	--	--
	R-66	Grand Terrace Road	59	60	61	1	2	No	--[5]	--[5]	--[5]	--[5]	--	--	--
	R-67	Vivienda Avenue	**69**	**70**	--[8]	--	--	-	--	--	--	--	--	--	--
	R-68	La Crosse Avenue	**69**	**70**	--[8]	--	--	-	--	--	--	--	--	--	--
	R-69	La Crosse Avenue	**70**	**71**	--[8]	--	--	-	--	--	--	--	--	--	--
3	R-70	Grand Terrace Road	62	63	**66**	3	4	Yes	--[5]	65	64	63	62	62	No
	R-71	Grand Terrace Road	60	61	64	3	4	No	--[5]	63	63	62	62	62	No
	R-72	Grand Terrace Road	60	61	63	2	3	No	--[5]	--	--	--	--	--	--
	R-73	Grand Terrace Road	59	60	61	1	2	No	--[5]	--	--	--	--	--	--

Table 2.13.G Alternative 3 Predicted Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-74	Grand Terrace Road	60	60	61	1	1	No	--[5]	--	--	--	--	--	--
	R-75	Grand Terrace Road	59	59	60	1	1	No	--[5]	--	--	--	--	--	--
	R-76	Grand Terrace Road	59	60	60	0	1	No	--[5]	--	--	--	--	--	--
3	R-77	Grand Terrace Road	63	64	**66**	2	3	Yes	--[5]	64	63	63	62	62	No
	R-78	Grand Terrace Road	60	61	65	4	5	No	--[5]	63	63	62	62	62	No
	R-79	Grand Terrace Road	60	60	62	2	2	No	--[5]	--	--	--	--	--	--
	R-80	Grand Terrace Road	60	60	61	1	1	No	--[5]	--	--	--	--	--	--
	R-81	Grand Terrace Road	59	60	61	1	2	No	--[5]	--	--	--	--	--	--
	R-82	Grand Terrace Road	59	60	60	0	1	No	--[5]	--	--	--	--	--	--
3	R-83	Grand Terrace Road	63	**66**	**67**	1	4	Yes	--[5]	63	63	62	62	61	No
	R-84	Grand Terrace Road	60	63	63	0	3	No	--[5]	62	61	61	61	61	No
	R-85	Grand Terrace Road	61	61	61	0	0	No	--[5]	--	--	--	--	--	--
	R-86	Grand Terrace Road	60	62	61	-1	1	No	--[5]	--	--	--	--	--	--
	R-87	Grand Terrace Road	60	61	60	-1	0	No	--[5]	--	--	--	--	--	--
	R-88	Grand Terrace Road	59	61	61	0	2	No	--[5]	--	--	--	--	--	--
	R-89	Grand Terrace Road	59	61	61	0	2	No	--[5]	--	--	--	--	--	--
	R-90	Vivienda Avenue	61	62	61	-1	0	No	--	--	--	--	--	--	--
	R-91	Vivienda Avenue	60	61	61	0	1	No	--	--	--	--	--	--	--
	R-92	Vivienda Avenue	60	60	60	0	0	No	--	--	--	--	--	--	--
	R-93	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-94	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-95	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-96	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-97	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-98	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-99	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-100	Grand Terrace Road	58	59	59	0	1	No	--	--	--	--	--	--	--
	R-101	Grand Terrace Road	59	59	--[8]	--	--	-	--	--	--	--	--	--	--
	R-102	Grand Terrace Road	59	59	--[8]	--	--	-	--	--	--	--	--	--	--

Table 2.13.G Alternative 3 Predicted Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-103	Grand Terrace Road	59	59	--[8]	--	--	-	--	--	--	--	--	--	--
	R-104	Grand Terrace Road	59	59	--[8]	--	--	-	--	--	--	--	--	--	--
	R-105	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
3	R-106	Grand Terrace Road	59	60	60	0	1	No	59	59	59	59	59	59	No
	R-107	Grand Terrace Road	62	63	64	1	2	No	61	60	60	59	59	59	No
	R-108	Vivienda Avenue	60	61	60	-1	0	No	--	--	--	--	--	--	--
	R-109	Vivienda Avenue	62	63	62	-1	0	No	--	--	--	--	--	--	--
	R-110	Vivienda Avenue	63	64	63	-1	0	No	--	--	--	--	--	--	--
	R-111	Vivienda Avenue	65	**66**	65	-1	0	No	--	--	--	--	--	--	--
	R-112	Vivienda Avenue	**70**	**71**	--[8]	--	--	-	--	--	--	--	--	--	--
4	R-113	Newport Avenue	63	64	64	0	1	No	64	64	64	64	64	NP	No
	R-114	Newport Avenue	62	63	62	-1	0	No	62	62	62	62	61	NP	No
	R-115	Newport Avenue	**66**	**66**	**67**	1	1	Yes	**66**	65	64	63	63	NP	No
5	R-115[9]	Newport Avenue	**66**	**66**	**67**	1	1	Yes	64	62	60	60	59	59	Yes (16ft)
4	R-121	Newport Avenue	64	64	65	1	1	No	64	64	64	63	63	NP	No
	R-122	Newport Avenue	63	64	64	0	1	No	63	63	63	62	62	NP	No
	R-123	Newport Avenue	64	65	65	0	1	No	65	64	64	63	62	NP	No
5	R-123[9]	Newport Avenue	64	65	65	0	1	No	64	61	60	60	59	59	Yes (16ft)
4	R-124	Newport Avenue	61	62	62	0	1	No	62	61	61	61	61	NP	No
	R-131	Taylor Street	68	70	71	1	3	No	--	--	--	--	--	--	--
	R-132	S. Iowa Avenue	70	71	72	1	2	No	--	--	--	--	--	--	--
	R-133	De Berry Street	73	74	75	1	2	No	--	--	--	--	--	--	--
	R-134	De Berry Street	69	70	70	0	1	No	--	--	--	--	--	--	--
	R-135	De Berry Street	72	74	74	0	2	No	--	--	--	--	--	--	--
	R-136	La Crosse Avenue	72	73	75	2	3	No	--	--	--	--	--	--	--
	R-137	Commerce Way	63	64	--[8]	--	--	-	--	--	--	--	--	--	--
	R-138	Michigan Avenue	53	55	63	8	10	No	--	--	--	--	--	--	--
	R-139	Barton Road	58	60	62	2	4	No	--	--	--	--	--	--	--
	R-140	Barton Road	61	62	66	4	5	No	--	--	--	--	--	--	--

Table 2.13.G Alternative 3 Predicted Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-141	Barton Road	61	62	66	4	5	No	--	--	--	--	--	--	--
	R-142	Barton Road	66	70	76	6	10	No	--	--	--	--	--	--	--
	R-143	Barton Road	66	70	**73**	3	7	NF[4]	--	--	--	--	--	--	--
2a & 2b	EI	Grand Terrace Elementary School	--	--	**72/50**[10]	--	--	Yes	65/43[10]	63/41[10]	62/40[10]	61/39[10]	60/38[10]	NP	Yes (14ft)

Source: *Noise Study Report* (February 2012).
[1] Receiver Nos. not shown are located beyond the limits of Alternative 3.
[2] Numbers in **bold** represent noise levels that approach or exceed the NAC for that specific land use.
[3] Underlined noise levels have been attenuated by at least 5 dBA (i.e., feasible barrier height).
[4] NF = Not Feasible. Although this receiver approaches or exceeds the NAC, it is not feasible to attenuate traffic noise levels with sound barriers due to driveway and pedestrian access to the property.
[5] Shaded area represents the existing wall height.
[6] NP = Not Permitted. Sound barriers within 15 ft of the nearest travel lane are not permitted to exceed 14 ft in height.
[7] Recommended barrier height.
[8] This receiver would be acquired under Alternative 3.
[9] An alternate sound barrier along the property line was evaluated for this receiver.
[10] Exterior/Interior noise level.

- **Receiver R-1:** This receiver location represents an existing residence along De Berry Street on the east side of I-215, south of Barton Road. Currently, there are no existing walls that shield this residence. One sound barrier (Sound Barrier [SB] Nos. 1a and 1b) was modeled along the edge of shoulder to shield this residence. SB Nos. 1a and 1b are two barriers that are evaluated as one barrier because they overlap with one another.
- **Receiver R-19:** This receiver location represents single-family residences along Barton Road, east of Vivienda Avenue. Currently, there are no existing walls that shield these residences. As there is driveway access onto the property from Barton Road, it is not feasible to abate traffic noise with sound barriers.
- **Receivers R-23 through R-25, and R-27 through R-32:** These receiver locations represent existing residences and the playground associated with the Grand Terrace Elementary School located along Vivienda Avenue, Vivienda Court, and Pascal Avenue on the east side of I-215 between Barton Road and Newport Avenue. An existing 5 to 7 ft high wall (Existing Wall [EW] No. 6) along the residential property line currently shields these residences. Currently, there are no existing walls that shield the school playground from I-215. One sound barrier (SB Nos. 2a and 2b) along the State right of way was modeled to shield these residences and the school playground. SB Nos. 2a and 2b are two barriers that are evaluated as one barrier because they overlap with one another.
- **Receivers R-70, R-77, and R-83:** These receiver locations represent existing mobile homes on the northeastern corner of Barton Road and Grand Terrace Road. An existing 5.3 to 6 ft high wall (EW No. 5) along the residential property line currently shields the mobile homes. One sound barrier (SB No. 3) along the State right of way was modeled to shield these mobile homes.
- **Receiver R-115:** This receiver location represents mobile homes along the west side of I-215 between Vivienda Avenue and Newport Avenue. Two existing 5.3 ft high walls (EW Nos. 7 and 8) along the residential property line currently shield these mobile homes. Two sound barriers were modeled separately at two different locations to shield these mobile homes. One sound barrier (SB No. 4) was modeled along the edge of shoulder and the other sound barrier (SB No. 5) was modeled along the residential property line. Sound barrier effectiveness at the two different locations was evaluated.

- **Receiver R-143:** This receiver location represents a fast-food restaurant with an outdoor eating area located on the east side of I-215, south of Barton Road. Currently, there are no existing walls that shield the outdoor eating area. As there is driveway access onto the property from Barton Road, it is not feasible to abate traffic noise with sound barriers.

Interior Noise Impacts

An interior noise analysis was conducted at the Grand Terrace Elementary School to evaluate classroom buildings under the Activity Category D (52) and to meet the requirements of Section 216 of the California Streets and Highways Code, which requires an interior noise analysis at public or private elementary or secondary schools. Grand Terrace Elementary School was the only location analyzed because it is the only school in the vicinity of the Project area. Figure 2.13.1 shows the location of the interior noise evaluation. As shown previously in Table 2.13.D, the calculated existing exterior-to-interior noise level attenuation for the school classroom building is 22.2 dBA. This noise reduction is a result of exterior noise being partly shielded by the classroom building structure (walls, doors, and windows, etc.).

Table 2.13.H shows that the predicted exterior traffic noise level would be 72.2 under Alternative 3. By reducing the predicted exterior noise level by the measured existing exterior to interior noise level attenuation of 22.2 dBA, the predicted future classroom interior noise level would be 50.0. Therefore, the interior noise levels would not approach or exceed the 52 dBA equivalent continuous sound level (L_{eq}) NAC under Alternative 3. Although the interior noise levels in the classroom buildings closest to I-215 would not approach or exceed the NAC, SB Nos. 2a & 2b were analyzed to shield classroom buildings closest to I-215 freeway.

Table 2.13.H Predicted Future Interior Noise Levels (dBA)

Receiver	Exterior to Interior Reduction[1]	Alternative 1		Alternative 3		Alternative 6		Modified Alternative 7 (Preferred Alternative)	
		Exterior	Interior	Exterior	Interior	Exterior	Interior	Exterior	Interior
EI-1	22.2	72.7	50.5	72.2	50.0	72.3	50.1	73.3	51.1

Sources: *Noise Study Report* (February 2012); *Supplemental Noise Study Report* (September 2013).
[1] The exterior-to-interior reduction was calculated based on the simultaneous exterior and interior noise level measurements at Grand Terrace Elementary School.

Alternative 6 (Modified Cloverleaf Interchange)

Long-Term Exterior Noise Impacts

The existing and future-worst-case traffic noise level results for Alternative 6 are shown in Table 2.13.I; a total of 20 receivers would approach or exceed the NAC under Alternative 6.

The following receiver locations would be or would continue to be exposed to noise levels that approach or exceed the NAC under Activity Categories B, C, D, and E under Alternative 6:

- **Receiver R-1:** This receiver location represents an existing residence along De Berry Street on the east side of I-215, south of Barton Road. Currently, there are no existing walls that shield this residence. One sound barrier (SB Nos. 11a and 11b) was modeled along the edge of shoulder to shield this residence. SB Nos. 11a and 11b are two barriers that are evaluated as one barrier because they overlap with one another.
- **Receiver R-19:** This receiver location represents a single-family residence along Barton Road and east of Vivienda Avenue. Currently, there are no existing walls that shield this residence. As there is driveway access onto the property from Barton Road, it is not feasible to abate traffic noise with sound barriers.
- **Receivers R-23 through R-25 and R-27 through R-32:** These receiver locations represent existing residences and the playground associated with Grand Terrace Elementary School located along Vivienda Avenue and Vivienda Court, on the east side of I-215 between Barton Road and Newport Avenue. An existing 6 ft high wall (EW No. 6) along the residential property line currently shields these residences. Currently, there are no existing walls that shield the school playground from I-215. One sound barrier (SB Nos. 12a and 12b) along the State right of way was modeled to shield these residences and the school playground. SB Nos. 12a and 12b are two barriers that are evaluated as one barrier because they overlap with one another.
- **Receivers R-60, R-70, R-77, and R-83:** These receiver locations represent existing mobile homes and a swimming pool area at Terrace Village RV Park along Grand Terrace Road on the west side of I-215 between Barton Road and Vivienda Avenue. An existing 8 to 12.6 ft high wall (EW No. 4) along Terrace Village RV Park property line currently shields this area. One sound barrier (SB No. 13) was modeled along the State right of way to shield the mobile homes and the swimming pool area at the Terrace Village RV Park.

Table 2.13.I Alternative 6 Predicted Traffic Noise Levels (2040) (dBA L_{eq})

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
11a & 11b	R-1	De Berry Street	65	**66**[2]	**67**	1	2	Yes	64	**66**	65	63	62[3]	61	No
	R-2	De Berry Street	53	55	61	6	8	No	--[4]	--	--	--	--	--	--
	R-3	Rene Lane	51	53	56	3	5	No	--	--	--	--	--	--	--
	R-4	De Berry Street	51	54	57	3	6	No	--	--	--	--	--	--	--
	R-5	De Berry Street	51	53	55	2	4	No	--	--	--	--	--	--	--
	R-6	Rene Lane	50	53	56	3	6	No	--	--	--	--	--	--	--
	R-7	Rene Lane	49	53	54	1	5	No	--	--	--	--	--	--	--
	R-8	Rene Lane	50	54	53	-1	3	No	--	--	--	--	--	--	--
	R-9	Rene Lane	52	57	53	-4	1	No	--	--	--	--	--	--	--
	R-10	Rene Lane	56	62	54	-8	-2	No	--	--	--	--	--	--	--
	R-11	Michigan Street	55	60	53	-7	-2	No	--	--	--	--	--	--	--
	R-12	Michigan Street	54	59	55	-4	1	No	--	--	--	--	--	--	--
	R-13	Michigan Street	55	60	59	-1	4	No	--	--	--	--	--	--	--
	R-14	Michigan Street	49	54	52	-2	3	No	--	--	--	--	--	--	--
	R-15	Michigan Street	47	51	52	1	5	No	--	--	--	--	--	--	--
	R-16	Michigan Street	49	53	57	4	8	No	--	--	--	--	--	--	--
	R-17	Barton Road	59	62	64	2	5	No	--	--	--	--	--	--	--
	R-18	Barton Road	58	61	62	1	4	No	--	--	--	--	--	--	--
	R-19	Barton Road	61	64	66	2	5	NF[5]	--	--	--	--	--	--	--
	R-20	Barton Road	56	59	61	2	5	No	--	--	--	--	--	--	--
	R-21	Barton Road	58	61	62	1	4	No	--	--	--	--	--	--	--
	R-22	Grand Terrace Elementary School	57	65	65	0	8	No	--[6]	64	64	64	64	NP[7]	--
12a & 12b	R-23	Grand Terrace Elementary School	**68**	69	69	0	1	Yes	64	63	62	61	61	NP	Yes (14ft)[8]
	R-24	Grand Terrace Elementary School	**70**	71	70	-1	0	Yes	64	63	62	61	60	NP	Yes (14ft)
	R-25	Grand Terrace Elementary School	**73**	**74**	75	1	2	Yes	**67**	65	63	62	61	NP	Yes (14ft)
	R-26	Vivienda Avenue	61	63	63	0	2	No	62	61	61	60	60	NP	Yes (14ft)

Table 2.13.I Alternative 6 Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
12a & 12b	R-27	Vivienda Court	**70**	**71**	**71**	0	1	Yes	**66**	65	64	62	61	NP	Yes (14ft)
	R-28	Vivienda Court	**74**	**75**	**75**	0	1	Yes	**69**	**67**	65	64	63	NP	Yes (14ft)
	R-29	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	**66**	65	64	62	61	NP	Yes (14ft)
	R-30	Vivienda Avenue	**68**	**69**	**69**	0	1	Yes	**67**	**67**	**66**	65	64	NP	Yes (14ft)
	R-31	Vivienda Avenue	**67**	**68**	**68**	0	1	Yes	**67**	65	64	63	62	NP	Yes (14ft)
	R-32	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	--[6]	**67**	**66**	65	63	NP	Yes (14ft)
	R-33	Vivienda Avenue	62	63	63	0	1	No	--[6]	60	59	58	57	NP	Yes (14ft)
12a & 12b	R-43	Barton Road	56	62	64	2	8	No	63	63	63	63	63	NP	Yes (14ft)
	R-44	Vivienda Avenue	56	60	62	2	6	No	61	61	61	61	60	NP	Yes (14ft)
	R-45	McClarren Street	55	59	61	2	6	No	60	59	59	59	59	NP	Yes (14ft)
	R-46	Carhart Avenue	57	59	58	-1	1	No	56	56	56	55	54	NP	Yes (14ft)
	R-47	Carhart Avenue	53	54	54	0	1	No	53	53	53	52	52	NP	Yes (14ft)
	R-48	Carhart Avenue	57	58	58	0	1	No	56	56	55	54	53	NP	Yes (14ft)
	R-49	Vivienda Avenue	52	53	53	0	1	No	52	52	52	51	50	NP	Yes (14ft)
	R-50	Pascal Avenue	57	58	58	0	1	No	57	56	56	55	54	NP	Yes (14ft)
	R-51	Pascal Avenue	55	56	56	0	1	No	54	54	54	53	52	NP	Yes (14ft)
13	R-60	Grand Terrace Road	60	61	**67**	6	7	Yes	61	--	--	--	--	--	Yes (16 ft)
	R-61	Grand Terrace Road	60	60	63	3	3	No	--[6]	--[6]	--[6]	--[6]	--	--	Yes (16 ft)
	R-62	Grand Terrace Road	60	60	63	3	3	No	--[6]	--[6]	--[6]	--[6]	--	--	Yes (16 ft)
	R-63	Grand Terrace Road	60	60	62	2	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--
	R-64	Grand Terrace Road	59	60	61	1	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--
	R-65	Grand Terrace Road	59	60	61	1	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--
	R-66	Grand Terrace Road	59	60	61	1	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--
14	R-67	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	65	64	63	62	62	NP	No
	R-68	La Crosse Avenue	**69**	**70**	**70**	0	1	Yes	65	63	62	62	61	NP	No

Table 2.13.I Alternative 6 Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-69	La Crosse Avenue	**70**	**71**	--[9]	--	--	--	--	--	--	--	--	--	--
13	R-70	Grand Terrace Road	62	63	**66**	3	4	Yes	--[6]	65	64	63	62	62	Yes (16 ft)
	R-71	Grand Terrace Road	60	61	63	2	3	No	--[6]	63	63	62	62	62	Yes (16 ft)
	R-72	Grand Terrace Road	60	61	62	1	2	No	--[6]	--	--	--	--	--	Yes (16 ft)
	R-73	Grand Terrace Road	59	60	61	1	2	No	--[6]	--	--	--	--	--	Yes (16 ft)
	R-74	Grand Terrace Road	60	60	60	0	0	No	--[6]	--	--	--	--	--	Yes (16 ft)
	R-75	Grand Terrace Road	59	59	60	1	1	No	--[6]	--	--	--	--	--	--
	R-76	Grand Terrace Road	59	60	60	0	1	No	--[6]	--	--	--	--	--	--
13	R-77	Grand Terrace Road	63	64	67	3	4	Yes	--[6]	64	63	63	62	62	Yes (16 ft)
	R-78	Grand Terrace Road	60	61	64	3	4	No	--[6]	63	63	62	62	62	--
	R-79	Grand Terrace Road	60	60	62	2	2	No	--[6]	--	--	--	--	--	--
	R-80	Grand Terrace Road	60	60	61	1	1	No	--[6]	--	--	--	--	--	--
	R-81	Grand Terrace Road	59	60	60	0	1	No	--[6]	--	--	--	--	--	--
	R-82	Grand Terrace Road	59	60	60	0	1	No	--[6]	--	--	--	--	--	--
13	R-83	Grand Terrace Road	63	**66**	**68**	2	5	Yes	--[6]	63	63	62	62	61	Yes (16 ft)
	R-84	Grand Terrace Road	60	63	64	1	4	No	--[6]	62	61	61	61	61	Yes (16 ft)
	R-85	Grand Terrace Road	61	61	62	1	1	No	--[6]	--	--	--	--	--	Yes (16 ft)
	R-86	Grand Terrace Road	60	62	63	1	3	No	--[6]	--	--	--	--	--	Yes (16 ft)
	R-87	Grand Terrace Road	60	61	61	0	1	No	--[6]	--	--	--	--	--	Yes (16 ft)
	R-88	Grand Terrace Road	59	61	62	1	3	No	--[6]	--	--	--	--	--	--
	R-89	Grand Terrace Road	59	61	61	0	2	No	--[6]	--	--	--	--	--	--
14	R-90	Vivienda Avenue	61	62	61	-1	0	No	61	60	60	60	60	NP	No
	R-91	Vivienda Avenue	60	61	61	0	1	No	60	60	60	60	60	NP	No
	R-92	Vivienda Avenue	60	60	60	0	0	No	60	60	60	60	60	NP	No
	R-93	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-94	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-95	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-96	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-97	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--

Table 2.13.I Alternative 6 Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-98	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-99	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-100	Grand Terrace Road	58	59	59	0	1	No	--	--	--	--	--	--	--
	R-101	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-102	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-103	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-104	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-105	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-106	Grand Terrace Road	59	60	60	0	1	No	--	--	--	--	--	--	--
	R-107	Grand Terrace Road	62	63	64	1	2	No	--	--	--	--	--	--	--
14	R-108	Vivienda Avenue	60	61	61	0	1	No	60	60	60	59	59	NP	No
	R-109	Vivienda Avenue	62	63	62	-1	0	No	61	61	60	60	60	NP	No
	R-110	Vivienda Avenue	63	64	63	-1	0	No	62	61	61	60	60	NP	No
	R-111	Vivienda Avenue	65	66	65	-1	0	Yes	63	63	62	61	61	NP	No
	R-112	Vivienda Avenue	**70**	**71**	**71**	0	1	Yes	**67**	**66**	65	63	63	NP	No
	R-113	Newport Avenue	63	64	64	0	1	No	64	64	64	64	64	NP	No
	R-114	Newport Avenue	62	63	63	0	1	No	62	62	62	62	61	NP	No
	R-115	Newport Avenue	**66**	66	66	0	0	Yes	**66**	65	64	63	63	NP	No
15	R-115[10]	Newport Avenue	**66**	**66**	**66**	0	0	Yes	63	59	57	55	54	53	No
14	R-121	Newport Avenue	64	64	64	0	0	No	64	64	64	63	63	NP	No
	R-122	Newport Avenue	63	64	64	0	1	No	63	63	63	62	62	NP	No
	R-123	Newport Avenue	64	65	65	0	1	No	64	64	64	63	62	NP	No
15	R-123[10]	Newport Avenue	64	65	65	0	1	No	63	59	57	55	54	53	No
14	R-124	Newport Avenue	61	62	62	0	1	No	61	61	61	61	61	NP	No
	R-131	Taylor Street	68	70	71	1	3	No	--	--	--	--	--	--	--
	R-132	S. Iowa Avenue	70	71	71	0	1	No	--	--	--	--	--	--	--
	R-133	De Berry Street	73	74	75	1	2	No	--	--	--	--	--	--	--
	R-134	De Berry Street	69	70	70	0	1	No	--	--	--	--	--	--	--
	R-135	De Berry Street	72	74	73	-1	1	No	--	--	--	--	--	--	--
	R-136	La Crosse Avenue	72	73	74	1	2	No	--	--	--	--	--	--	--

Table 2.13.I Alternative 6 Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project Minus No Project Conditions	With Project Minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-137	Commerce Way	63	64	--[9]	--	--	--	--	--	--	--	--	--	--
	R-138	Michigan Avenue	53	55	62	7	9	No	--	--	--	--	--	--	--
	R-139	Barton Road	58	60	61	1	3	No	--	--	--	--	--	--	--
	R-140	Barton Road	61	62	65	3	4	No	--	--	--	--	--	--	--
	R-141	Barton Road	61	62	65	3	4	No	--	--	--	--	--	--	--
	R-142	Barton Road	66	70	74	4	8	No	--	--	--	--	--	--	--
	R-143	Barton Road	66	70	**73**	3	7	NF[5]	--	--	--	--	--	--	--
12a & 12b	EI	Grand Terrace Elementary School	--	--	72/50[11]	--	2	Yes	**66**/43[11]	63/41[11]	62/40[11]	61/39[11]	60/38[11]	NP	Yes (14ft)

Source: *Noise Study Report* (February 2012).
[1] Receiver Nos. not shown are located beyond the limits of Alternative 6.
[2] Numbers in **bold** represent noise levels that approach or exceed the NAC for that specific land use.
[3] Underlined noise levels have been attenuated by at least 5 dBA (i.e., feasible barrier height).
[4] Either no barrier was analyzed at this location because the modeled receiver would not approach or exceed the NAC or this receiver would be acquired under this alternative.
[5] NF = Not Feasible. Although this receiver approaches or exceeds the NAC, it is not feasible to attenuate traffic noise levels with sound barriers due to driveway and pedestrian access to the property.
[6] Shaded area represents the existing wall height.
[7] NP = Not Permitted. Sound barriers within 15 ft of the nearest travel lane are not permitted to exceed 14 ft in height.
[8] Recommended barrier height.
[9] This receiver would be acquired under Alternative 6.
[10] An alternate sound barrier along the property line was evaluated for this receiver.
[11] Exterior/Interior noise level.

- **Receivers R-67, R-68, R-112, and R-115:** These receiver locations represent existing mobile homes along Newport Avenue and residences along Vivienda Avenue and La Crosse Avenue on the west side of I-215 between Barton Road and Newport Avenue. Currently, there are no existing walls that shield Receivers R-67, R-68, and R-112. Two existing 5.3 ft high walls (EW Nos. 7 and 8) along the residential property line currently shield Receiver R-115. Two sound barriers were modeled separately at two different locations to shield these residences. One sound barrier (SB No. 14) located along the edge of shoulder was modeled and the other sound barrier (SB No. 15) located along the residential property line was modeled to shield only Receiver R-115. Sound barrier effectiveness at the two different locations was evaluated.
- **Receiver R-143:** This receiver location represents a fast-food restaurant with an outdoor eating area located on the east side of I-215, south of Barton Road. Currently, there are no existing walls that shield the outdoor eating area. As there is driveway access onto the property from Barton Road, it is not feasible to abate traffic noise with sound barriers.

Interior Noise Impacts

An interior noise analysis was conducted at the Grand Terrace Elementary School, which is the only school in the vicinity of the Project area. As shown previously in Table 2.13.D, the calculated existing exterior-to-interior noise level attenuation for the school classroom building is 22.2 dBA. This noise reduction is a result of exterior noise being partly shielded by the classroom building structure (walls, doors, and windows, etc.).

As shown in Table 2.13.H, the predicted traffic noise levels at Grand Terrace Elementary School would be 72.3 dBA L_{eq} under Alternative 6. By reducing the predicted exterior noise level by the measured existing exterior to interior noise level attenuation of 22.2 dBA, the predicted future classroom interior noise level would be 50.1 dBA L_{eq}. Interior noise levels would not approach or exceed the 52 dBA L_{eq} NAC under Alternative 6. Although the interior noise levels in the classroom buildings closest to I-215 would not approach or exceed the NAC, SB Nos. 12a & 12b were analyzed to shield classroom buildings closest to I-215 freeway.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Long-Term Exterior Noise Impacts

The existing and future-worst-case traffic noise level results for Modified Alternative 7 are shown in Table 2.13.J; 22 receivers would approach or exceed the NAC under Modified Alternative 7.

The following receiver locations would be or would continue to be exposed to noise levels that approach or exceed the NAC under Activity Categories B, C, D, and E under Modified Alternative 7:

- **Receiver R-1:** This receiver location represents an existing residence along De Berry Street on the east side of I-215, south of Barton Road. Currently, there are no existing walls that shield this residence. One sound barrier (SB Nos. 22a and 22b) was modeled along the edge of shoulder to shield this residence. SB Nos. 22a and 22b are two barriers that are evaluated as one barrier because they overlap with one another.
- **Receiver R-19:** This receiver location represents a single-family residence along Barton Road and east of Vivienda Avenue. Currently, there are no existing walls that shield this residence. As there is driveway access onto the property from Barton Road, it is not feasible to abate traffic noise with sound barriers.
- **Receivers R-23 through R-25, R-27 through R-32, and R-35:** These receiver locations represent existing residences and the playground associated with Grand Terrace Elementary School along Vivienda Avenue, Vivienda Court, and Pascal Avenue on the east side of I-215 between Barton Road and Newport Avenue. An existing 5 to 7 ft high wall (EW No. 6) along the residential property line currently shields these residences. Currently, there are no existing walls that shield the school playground from I-215. One sound barrier (SB Nos. 23a and 23b) along the State right of way was modeled to shield these residences and the school playground. SB Nos. 23a and 23b are two barriers that are evaluated as one barrier because they overlap with one another.
- **Receiver R-60:** This receiver location represents an existing swimming pool at Terrace Village RV Park located on the west side of I-215 between Barton Road and Vivienda Avenue. An existing 8 to 12.6 ft high wall (EW No. 4) along the residential property line currently shields the swimming pool area.

Table 2.13.J Modified Alternative 7 (Preferred Alternative) Predicted Traffic Noise Levels (2040) (dBA L_{eq})

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project minus No Project Conditions	With Project minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
22a & 22b	R-1	De Berry Street	65	**66**[2]	**67**	1	2	Yes	**66**	65	64	63	62[3]	60	No
	R-2	De Berry Street	53	55	57	2	4	No	--[4]	--	--	--	--	--	--
	R-3	Rene Lane	51	53	56	3	5	No	--	--	--	--	--	--	--
	R-4	De Berry Street	51	54	56	2	5	No	--	--	--	--	--	--	--
	R-5	De Berry Street	51	53	55	2	4	No	--	--	--	--	--	--	--
	R-6	Rene Lane	50	53	56	3	6	No	--	--	--	--	--	--	--
	R-7	Rene Lane	49	53	55	2	6	No	--	--	--	--	--	--	--
	R-8	Rene Lane	50	54	55	1	5	No	--	--	--	--	--	--	--
	R-9	Rene Lane	52	57	56	-1	4	No	--	--	--	--	--	--	--
	R-10	Rene Lane	56	62	60	-2	4	No	--	--	--	--	--	--	--
	R-11	Michigan Street	55	60	59	-1	4	No	--	--	--	--	--	--	--
	R-12	Michigan Street	54	59	59	0	5	No	--	--	--	--	--	--	--
	R-13	Michigan Street	55	60	61	1	6	No	--	--	--	--	--	--	--
	R-14	Michigan Street	49	54	53	-1	4	No	--	--	--	--	--	--	--
	R-15	Michigan Street	47	51	53	2	6	No	--	--	--	--	--	--	--
	R-16	Michigan Street	49	53	56	3	7	No	--	--	--	--	--	--	--
	R-17	Barton Road	59	62	64	2	5	No	--	--	--	--	--	--	--
	R-18	Barton Road	58	61	62	1	4	No	--	--	--	--	--	--	--
	R-19	Barton Road	61	64	**66**	2	5	NF[5]	NF	NF	NF	NF	NF	NF	NF
	R-20	Barton Road	56	59	60	1	4	No	--	--	--	--	--	--	--
	R-21	Barton Road	58	61	63	2	5	No	--	--	--	--	--	--	--
23a & 23b	R-22	Grand Terrace Elementary School	57	65	65	0	8	No	--[6]	--[6]	64	64	63	NP[7]	Yes (14ft)[8]
	R-23	Grand Terrace Elementary School	**68**	**69**	**72**	3	4	Yes	**70**	**68**	**66**	65	63	NP	Yes (14ft)
	R-24	Grand Terrace Elementary School	**70**	**71**	**72**	1	2	Yes	**71**	**69**	**67**	65	63	NP	Yes (14ft)
	R-25	Grand Terrace Elementary School	**73**	**74**	**75**	1	2	Yes	**74**	**72**	**69**	**66**	64	NP	Yes (14ft)
	R-26	Vivienda Avenue	61	63	63	0	2	No	62	61	61	60	59	NP	Yes (14ft)

Table 2.13.J Modified Alternative 7 (Preferred Alternative) Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project minus No Project Conditions	With Project minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
23a & 23b	R-27	Vivienda Court	**70**	**71**	**71**	0	1	Yes	**68**	**66**	65	63	62	NP	Yes (14ft)
	R-28	Vivienda Court	**74**	**75**	**75**	0	1	Yes	**71**	**68**	**66**	64	63	NP	Yes (14ft)
	R-29	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	**67**	**66**	65	63	61	NP	Yes (14ft)
	R-30	Vivienda Avenue	**68**	**69**	**69**	0	1	Yes	**67**	**66**	65	64	63	NP	Yes (14ft)
	R-31	Vivienda Avenue	**67**	**68**	**68**	0	1	Yes	**67**	65	64	62	62	NP	Yes (14ft)
	R-32	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	--[6]	**67**	**66**	65	63	NP	Yes (14ft)
	R-33	Vivienda Avenue	62	63	64	1	2	No	--[6]	62	62	61	59	NP	Yes (14ft)
	R-34	Pascal Avenue	64	65	65	0	1	No	--[6]	63	62	61	60	NP	Yes (14ft)
	R-35	Pascal Avenue	**74**	**75**	**75**	0	1	Yes	--[6]	**69**	**67**	65	64	NP	Yes (14ft)
	R-36	Pascal Avenue	53	54	53	-1	0	No	--[6]	52	52	51	50	NP	Yes (14ft)
	R-37	Pascal Avenue	55	55	55	0	0	No	--[6]	53	53	52	51	NP	Yes (14ft)
	R-38	Victoria Street	56	56	56	0	0	No	--[6]	55	55	54	53	NP	Yes (14ft)
	R-43	Barton Road	56	62	63	1	7	No	--	--	--	--	--	--	--
	R-44	Vivienda Avenue	56	60	62	2	6	No	--	--	--	--	--	--	--
	R-45	McClarren Street	55	59	60	1	5	No	--	--	--	--	--	--	--
23a & 23b	R-46	Carhart Avenue	57	59	59	0	2	No	57	56	56	55	54	NP	Yes (14ft)
	R-47	Carhart Avenue	53	54	54	0	1	No	53	53	53	52	51	NP	Yes (14ft)
	R-48	Carhart Avenue	57	58	58	0	1	No	57	57	56	55	54	NP	Yes (14ft)
	R-49	Vivienda Avenue	52	53	53	0	1	No	52	52	52	51	50	NP	Yes (14ft)
	R-50	Pascal Avenue	57	58	58	0	1	No	57	57	56	55	54	NP	Yes (14ft)
	R-51	Pascal Avenue	55	56	56	0	1	No	54	54	54	53	52	NP	Yes (14ft)
24	R-60	Grand Terrace Road	60	61	**68**	7	8	Yes	64	63	62	62	61	61	No
	R-61	Grand Terrace Road	60	60	64	4	4	No	62	62	61	61	61	61	No
	R-62	Grand Terrace Road	60	60	63	3	3	No	--	--	--	--	--	--	--
	R-63	Grand Terrace Road	60	60	62	2	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--
	R-64	Grand Terrace Road	59	60	62	2	3	No	--[6]	--[6]	--[6]	--[6]	--	--	--
	R–65	Grand Terrace Road	59	60	61	1	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--
	R–66	Grand Terrace Road	59	60	61	1	2	No	--[6]	--[6]	--[6]	--[6]	--	--	--

Table 2.13.J Modified Alternative 7 (Preferred Alternative) Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project minus No Project Conditions	With Project minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
25	R-67	Vivienda Avenue	**69**	**70**	**70**	0	1	Yes	65	64	63	62	62	NP	No
	R-68	La Crosse Avenue	**69**	**70**	**70**	0	1	Yes	64	63	62	61	61	NP	No
	R-69	La Crosse Avenue	**70**	**71**	--[9]	--	--	--	--	--	--	--	--	--	--
24	R-70	Grand Terrace Road	62	63	**66**	3	4	No	--[6]	64	63	62	62	62	No
	R-71	Grand Terrace Road	60	61	64	3	4	No	--[6]	62	61	61	61	61	No
	R-72	Grand Terrace Road	60	61	63	2	3	No	--[6]	61	61	61	61	60	No
	R-73	Grand Terrace Road	59	60	61	1	2	No	--[6]	60	60	60	60	60	No
	R-74	Grand Terrace Road	60	60	61	1	1	No	--[6]	60	60	60	60	60	No
	R-75	Grand Terrace Road	59	59	60	1	1	No	--[6]	--	--	--	--	--	--
	R-76	Grand Terrace Road	59	60	60	0	1	No	--[6]	--	--	--	--	--	--
24	R-77	Grand Terrace Road	63	64	**67**	3	4	Yes	--[6]	63	63	62	62	62	No
	R-78	Grand Terrace Road	60	61	65	4	5	No	--[6]	62	62	61	61	61	No
	R-79	Grand Terrace Road	60	60	62	2	2	No	--[6]	61	61	61	60	60	No
	R-80	Grand Terrace Road	60	60	61	1	1	No	--[6]	60	60	60	60	60	No
	R-81	Grand Terrace Road	59	60	61	1	2	No	--[6]	--	--	--	--	--	--
	R-82	Grand Terrace Road	59	60	60	0	1	No	--[6]	--	--	--	--	--	--
24	R-83	Grand Terrace Road	63	**66**	**67**	1	4	Yes	--[6]	64	63	63	63	63	No
	R-84	Grand Terrace Road	60	63	63	0	3	No	--[6]	62	62	62	62	62	No
24	R-85	Grand Terrace Road	61	61	62	1	1	No	--[6]	61	61	61	61	61	No
	R-86	Grand Terrace Road	60	62	62	0	2	No	--[6]	62	62	62	62	62	No
	R-87	Grand Terrace Road	60	61	61	0	1	No	--[6]	61	61	61	61	61	No
	R-88	Grand Terrace Road	59	61	62	1	3	No	--[6]	--	--	--	--	--	--
	R-89	Grand Terrace Road	59	61	61	0	2	No	--[6]	--	--	--	--	--	--
25	R-90	Vivienda Avenue	61	62	62	0	1	No	61	61	61	60	60	NP	No
	R-91	Vivienda Avenue	60	61	61	0	1	No	60	60	60	60	60	NP	No
	R-92	Vivienda Avenue	60	60	60	0	0	No	60	60	60	60	60	NP	No
	R 93	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--

Table 2.13.J Modified Alternative 7 (Preferred Alternative) Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project minus No Project Conditions	With Project minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
	R-94	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-95	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-96	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-97	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-98	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-99	Grand Terrace Road	58	58	58	0	0	No	--	--	--	--	--	--	--
	R-100	Grand Terrace Road	58	59	59	0	1	No	--	--	--	--	--	--	--
	R-101	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-102	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-103	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-104	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-105	Grand Terrace Road	59	59	59	0	0	No	--	--	--	--	--	--	--
	R-106	Grand Terrace Road	59	60	60	0	1	No	--	--	--	--	--	--	--
	R-107	Grand Terrace Road	62	63	63	0	1	No	--	--	--	--	--	--	--
25	R-108	Vivienda Avenue	60	61	61	0	1	No	60	60	60	60	60	NP	No
	R-109	Vivienda Avenue	62	63	63	0	1	No	61	61	61	60	60	NP	No
	R-110	Vivienda Avenue	63	64	63	-1	0	No	62	61	61	61	60	NP	No
	R-111	Vivienda Avenue	65	**66**	**66**	0	1	Yes	64	63	62	62	61	NP	No
	R-112	Vivienda Avenue	**70**	**71**	**71**	0	1	Yes	**67**	66	65	63	63	NP	No
25	R-113	Newport Avenue	63	64	65	1	2	No	65	64	63	62	61	NP	No
	R-114	Newport Avenue	62	63	63	0	1	No	62	62	61	60	60	NP	No
	R-115	Newport Avenue	**66**	**66**	**67**	1	1	Yes	**66**	65	64	63	62	NP	No
26	R-115[10]	Newport Avenue	**66**	**66**	**67**	1	1	Yes	64	62	60	60	59	59	Yes (16ft)
25	R-116	Newport Avenue	**66**	**66**	**66**	0	0	Yes	63	63	62	61	60	NP	No
26	R-116[10]	Newport Avenue	**66**	**66**	**66**	0	0	Yes	64	61	60	60	59	59	Yes (16ft)
25	R-117	Newport Avenue	63	63	63	0	0	No	62	62	61	60	60	NP	No
25	R-121	Newport Avenue	64	64	65	1	1	No	64	63	62	61	60	NP	No
	R-122	Newport Avenue	63	64	64	0	1	No	63	63	62	61	61	NP	No
	R-123	Newport Avenue	64	65	65	0	1	No	65	64	63	62	61	NP	No

Table 2.13.J Modified Alternative 7 (Preferred Alternative) Predicted Traffic Noise Levels (2040) (dBA L_{eq}) (Continued)

Sound Barrier No.	Receiver No.[1]	Location	Adjusted Existing Peak Noise Level	Predicted Noise Level Without Project	Predicted Noise Level With Project	With Project minus No Project Conditions	With Project minus Existing Conditions	Noise Impact Requiring Abatement Consideration	Predicted Noise Level with Abatement						Reasonable and Feasible
									6 ft wall	8 ft wall	10 ft wall	12 ft wall	14 ft wall	16 ft wall	
26	R-123[10]	Newport Avenue	64	65	65	0	1	No	64	61	60	60	59	59	Yes (16ft)
25	R-124	Newport Avenue	61	62	62	0	1	No	62	61	61	60	60	NP	No
	R-125	Newport Avenue	60	60	60	0	0	No	60	60	59	59	59	NP	No
25	R-126	Newport Avenue	60	60	60	0	0	No	59	59	59	59	59	NP	No
	R-127	Newport Avenue	59	59	59	0	0	No	59	59	59	59	59	NP	No
	R-131	Taylor Street	68	70	71	1	3	No	--	--	--	--	--	--	--
	R-132	S. Iowa Avenue	70	71	72	1	2	No	--	--	--	--	--	--	--
	R-133	De Berry Street	73	74	75	1	2	No	--	--	--	--	--	--	--
	R-134	De Berry Street	69	70	70	0	1	No	--	--	--	--	--	--	--
	R-135	De Berry Street	72	74	74	0	2	No	--	--	--	--	--	--	--
	R-136	La Crosse Avenue	72	73	73	0	1	No	--	--	--	--	--	--	--
	R-137	Commerce Way	63	64	--[9]	--	--	--	--	--	--	--	--	--	--
	R-138	Michigan Avenue	53	55	60	5	7	No	--	--	--	--	--	--	--
	R-139	Barton Road	58	60	60	0	2	No	--	--	--	--	--	--	--
	R-140	Barton Road	61	62	64	2	3	No	--	--	--	--	--	--	--
	R-141	Barton Road	61	62	65	3	4	No	--	--	--	--	--	--	--
	R-142	Barton Road	66	70	73	3	7	No	--	--	--	--	--	--	--
	R-143	Barton Road	66	70	**72**	2	6	NF[4]	--	--	--	--	--	--	--
23a & 23b	EI	Grand Terrace Elementary School	--	--	73/**51**[11]	--	--	--	70/48[11]	67/45[11]	66/44[11]	63/41[11]	62/40[11]	NP	Yes (14ft)

Source: *Supplemental Noise Study Report* (September 2013).
[1] Receiver Nos. not shown are located beyond the limits of Modified Alternative 7.
[2] Numbers in **bold** represent noise levels that approach or exceed the NAC for that specific land use.
[3] Underlined noise levels have been attenuated by at least 5 dBA (i.e., feasible barrier height).
[4] Either no barrier was analyzed at this location because the modeled receiver would not approach or exceed the NAC or this receiver would be acquired under this alternative.
[5] NF = Not Feasible. Although this receiver approaches or exceeds the NAC, it is not feasible to attenuate traffic noise levels with sound barriers due to driveway and pedestrian access to the property.
[6] Shaded areas represent the existing wall height.
[7] NP = Not Permitted. Sound barriers within 15 ft of the nearest travel lane are not permitted to exceed 14 ft in height.
[8] Recommended barrier height.
[9] This receiver would be acquired under Modified Alternative 7.
[10] An alternate sound barrier along the property line was evaluated for this receiver.
[11] Exterior/Interior noise level.

One sound barrier (SB No. 19) along the State right of way was modeled to shield these areas.

- **Receivers R-77 and R-83:** These receiver locations represent existing mobile homes along Grand Terrace Road on the west side of I-215 between Barton Road and Vivienda Avenue. An existing 5.3 to 6 ft high wall (EW No. 5) along the residential property line currently shields the mobile homes. One sound barrier (SB No. 24) along the State right of way was modeled to shield these areas.
- **Receivers R-67, R-68, R-111, R-112, R-115, and R-116:** These receiver locations represent existing single-family residences and mobile homes on the west side of I-215 between Barton Road and Newport Avenue. Two existing 5.3 ft high walls (EW Nos. 7 and 8) along the residential property line currently shield these mobile homes. Two sound barriers were modeled at two different locations to shield the mobile homes. One sound barrier (SB No. 25) was modeled along the edge of shoulder, and the other sound barrier (SB No. 26) was modeled along the residential property line to shield only Receivers R-115 and R-116. Sound barrier effectiveness at the two different locations was evaluated.
- **Receiver R-143:** This receiver location represents a fast-food restaurant with an outdoor eating area located on the east side of I-215, south of Barton Road. Currently, there are no existing walls that shield the outdoor eating area. As there is driveway access onto the property from Barton Road, it is not feasible to abate traffic noise with sound barriers.

Interior Noise Impacts

An interior noise analysis was conducted at the Grand Terrace Elementary School, which is the only school in the vicinity of the Project area. As shown previously in Table 2.13.D, the calculated existing exterior-to-interior noise level attenuation for the school classroom building is 22.2 dBA. This noise reduction is a result of exterior noise being partly shielded by the classroom building structure (walls, doors, and windows, etc.).

As shown in Table 2.13.H, the predicted traffic noise levels at Grand Terrace Elementary School would be 73.3 dBA L_{eq} under Modified Alternative 7. By reducing the predicted exterior noise level by the measured existing exterior-to-interior noise level attenuation of 22.2 dBA, the predicted future classroom interior noise level would be 51.1 dBA L_{eq}. Interior noise levels would approach or exceed

the 52 dBA L_{eq} NAC under Modified Alternative 7. Therefore, SB Nos. 23a & 23b were analyzed to shield classroom buildings closest to I-215 freeway.

CEQA Noise Analysis

In the future (2040) build condition, one or more receivers would experience up to a 10 dBA increase in noise levels under Alternative 3 (Table 2.13.G), up to a 9 dBA increase in noise levels under Alternative 6 (Table 2.13.I), and up to an 8 dBA increase in noise levels under Modified Alternative 7 (Table 2.13.J) as compared to existing conditions (Table 2.13.C).

Under CEQA, comparison is made between the existing noise level and the build noise level. A 3 dBA difference is generally the point at which the human ear will perceive a difference in noise level. Based on the projected comparative increases identified above, a perceptible increase in noise may be experienced at some locations; however, none of the receivers in the Project area are expected to experience a 12 dBA increase, and because their existing location is in close proximity to existing I-215 and/or Barton Road, and these sensitive receptors are recognized as already being in an area regularly subject to noticeable traffic noise associated with these facilities, the noise from the Project after construction is complete is not expected to be perceived as a substantial change in the noise environment. Accordingly, the noise increase associated with the Project is not considered significant under CEQA, and no mitigation is required.

Sound Barrier Reconstruction

A portion of the sound barrier constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project, located adjacent to the Grand Royal Mobile Estates, would be removed to allow for reconstruction of the I-215 southbound off-ramp and the new southbound on-ramp that are part of the Project. Alternatives 3, 6, and Modified Alternative 7 would remove 650 ft, 250 ft, and 285 ft of the sound barrier, respectively. The removed portion of the sound barrier would be reconstructed along the planned new State right of way line. The replacement of the sound barrier at the new State right of way with the same height would be acoustically equivalent or better than the original location.

2.13.4 Avoidance, Minimization, and/or Abatement Measures

2.13.4.1 Noise Abatement Consideration

Sound Barrier Modeling

Sound barriers were considered to shield noise-sensitive receivers along the planned I-215/Barton Road Interchange improvement from south of Barton Road to north of Newport Avenue, where receivers would continue to be exposed to traffic noise levels approaching or exceeding the NAC. All properties requiring abatement consideration are within Categories B through D (67 and 52 dBA L_{eq} NAC). Bold numbers in Tables 2.13.G, 2.13.I and 2.13.J show receiver locations that would approach or exceed the NAC under Alternatives 3, 6, and Modified Alternative 7 traffic conditions, respectively. Six sound barrier heights were analyzed: 6, 8, 10, 12, 14, and 16 ft. Sound barriers with the height of 16 ft were not analyzed if the barrier would be located within 15 ft of the nearest travel lane.

The following sound barriers were analyzed to shield the sensitive receiver locations that would be exposed to traffic noise levels approaching or exceeding the NAC for each of the three Build Alternatives:

Alternative 3 (Partial Cloverleaf Interchange)

- **SB Nos. 1a and 1b:** A 2,144 ft long barrier along the State right of way on the east side of I-215 south of Barton Road was analyzed to shield Receiver R-1.
- **SB Nos. 2a and 2b:** A 2,086 ft long barrier along the State right of way on the east side of I-215 between Barton Road and Newport Avenue was analyzed to shield Receivers R-23 through R-25, R-27 through R-32, and the exterior/interior receiver.
- **SB No. 3:** A 705 ft long barrier along the State right of way on the northeastern corner of Barton Road and Grand Terrace Road was analyzed to shield Receivers R-70, R-77, and R-83.
- **SB No. 4:** A 619 ft long barrier along the edge of shoulder on the west side of I-215 between Vivienda Avenue and Newport Avenue was analyzed to shield Receiver R-115.
- **SB No. 5:** A 270 ft long barrier along the residential property line on the west side of I-215 between Vivienda Avenue and Newport Avenue was analyzed to shield Receiver R-115.

Alternative 6 (Modified Cloverleaf Interchange)

- **SB Nos. 11a and 11b:** A 1,801 ft long barrier along the State right of way on the east side of I-215 south of Barton Road was analyzed to shield Receiver R-1.
- **SB Nos. 12a and 12b:** A 1,985 ft long barrier within the State right of way on the east side of I-215 between Barton Road and Newport Avenue was analyzed to shield Receivers R-23 through R-25, R-27 through R-32, and the exterior/interior receiver.
- **SB No. 13:** A 926 ft long barrier along the State right of way on the west side of I-215 between Barton Road and Vivienda Avenue was analyzed to shield Receivers R-60, R-70, R-77, and R-83.
- **SB No. 14:** A 1,291 ft long barrier along the edge of shoulder on the west side of I-215 between Vivienda Avenue and Newport Avenue was analyzed to shield Receivers R-67, R-68, R-112, and R-115. Approximately 235 ft of the southern portion of this barrier (Station [STA] 77+00 to STA 79+35) would conflict with the I-215 Bi-County HOV Lane Gap Closure Project sound barrier. A portion of SB No. 14 along the edge of shoulder on the west side of I-215 was analyzed to shield only Receiver R-115. A shorter sound barrier length of 500 ft from Station (STA) 85+00 to STA 90+00 would be used to compare with SB No. 15 to evaluate the effectiveness of the two sound barrier locations.
- **SB No. 15:** A 270 ft long barrier along the residential property line on the west side of I-215 between Vivienda Avenue and Newport Avenue was analyzed to shield Receiver R-115.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

- **SB Nos. 22a and 22b:** A 2,149 ft long barrier along the State right of way on the east side of I-215 south of Barton Road was analyzed to shield Receiver R-1.
- **SB Nos. 23a and 23b:** A 2,160 ft long barrier within the State right of way on the east side of I-215 between Barton Road and Newport Avenue was analyzed to shield Receivers R-23 through R-25, R-27 through R-32, R-35, and the exterior/interior receiver.
- **SB No. 24:** A 890 ft long barrier along the State right of way on the northwestern corner of I-215 and Barton Road was analyzed to shield Receivers R-60, R-70, R-77, and R-83.
- **SB No. 25:** A 1,488 ft long barrier along the edge of shoulder on the west side of I-215 between Barton Road and Newport Avenue was analyzed to shield Receivers R-67, R-68, R-111, R-112, R-115, and R-116. Approximately 235 ft of

the southern portion of this barrier (STA 77+00 to STA 79+35) would conflict with the I-215 Bi-County HOV Lane Gap Closure Project sound barrier. A portion of SB No. 25 along the edge of shoulder on the west side of I-215 was analyzed to shield only Receivers R-115 and R-116. A shorter sound barrier length of 500 ft from STA 85+00 to STA 90+00 was used to compare with SB No. 26 to evaluate the effectiveness of the two sound barrier locations.

- **SB No. 26:** A 353 ft long barrier along the residential property line on the west side of I-215 between Vivienda Avenue and Newport Avenue was analyzed to shield Receivers R-115 and R-116.

It would not be feasible to abate traffic noise with a sound barrier at receivers R-19 and R-143 because there is driveway access onto these properties from Barton Road.

The locations of all the evaluated sound barriers for Alternatives 3, 6, and Modified Alternative 7 are shown in Figures 2.13.2, 2.13.3, and 2.13.4, respectively.

2.13.4.2 Sound Barrier Feasibility

Caltrans Traffic Noise Analysis Protocol states that a minimum noise reduction of 5 dBA must be achieved at the impacted receivers in order for the proposed noise abatement measure to be considered feasible. The feasibility criterion is not necessarily a noise abatement design goal. Greater noise reductions are encouraged if they can be reasonably achieved. The following elements may restrict feasibility:

- Topography
- Access requirements for driveways
- Local cross streets
- Underground utilities
- Other noise sources in the area
- Safety considerations

Of the 15 sound barriers evaluated, 14 sound barriers were capable of reducing noise levels by 5 dBA or more, as required to be considered feasible. SB No. 4 was determined to be not feasible because the barrier would not reduce noise levels by 5 dBA or more.

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LEGEND

- Alternative 3
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

I:\SBA330\Barton_I-215\GIS\ISEA\NoiseAnalysis_Alt3_Mapbook.mxd (10/22/2013)

Map Index

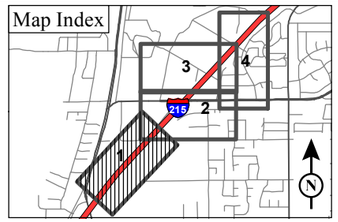

FIGURE 2.13.2
Sheet 1 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 3
Modeled Sound Barriers and Receiver Locations

Note: Receivers R-39 to R-42, R-52 to R-59, R-119 to R-120, and R-129 to R-130 are not shown because they are located beyond the limits of construction under alternative 3.

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LEGEND

- Alternative 3
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200 FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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Note: Receivers R-39 to R-42, R-52 to R-59, R-119 to R-120, and R-129 to R-130 are not shown because they are located beyond the limits of construction under alternative 3.

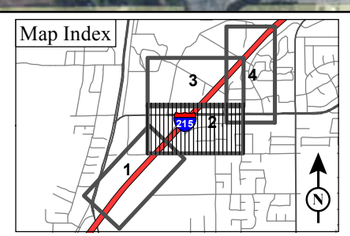

FIGURE 2.13.2
Sheet 2 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 3
Modeled Sound Barriers and Receiver Locations

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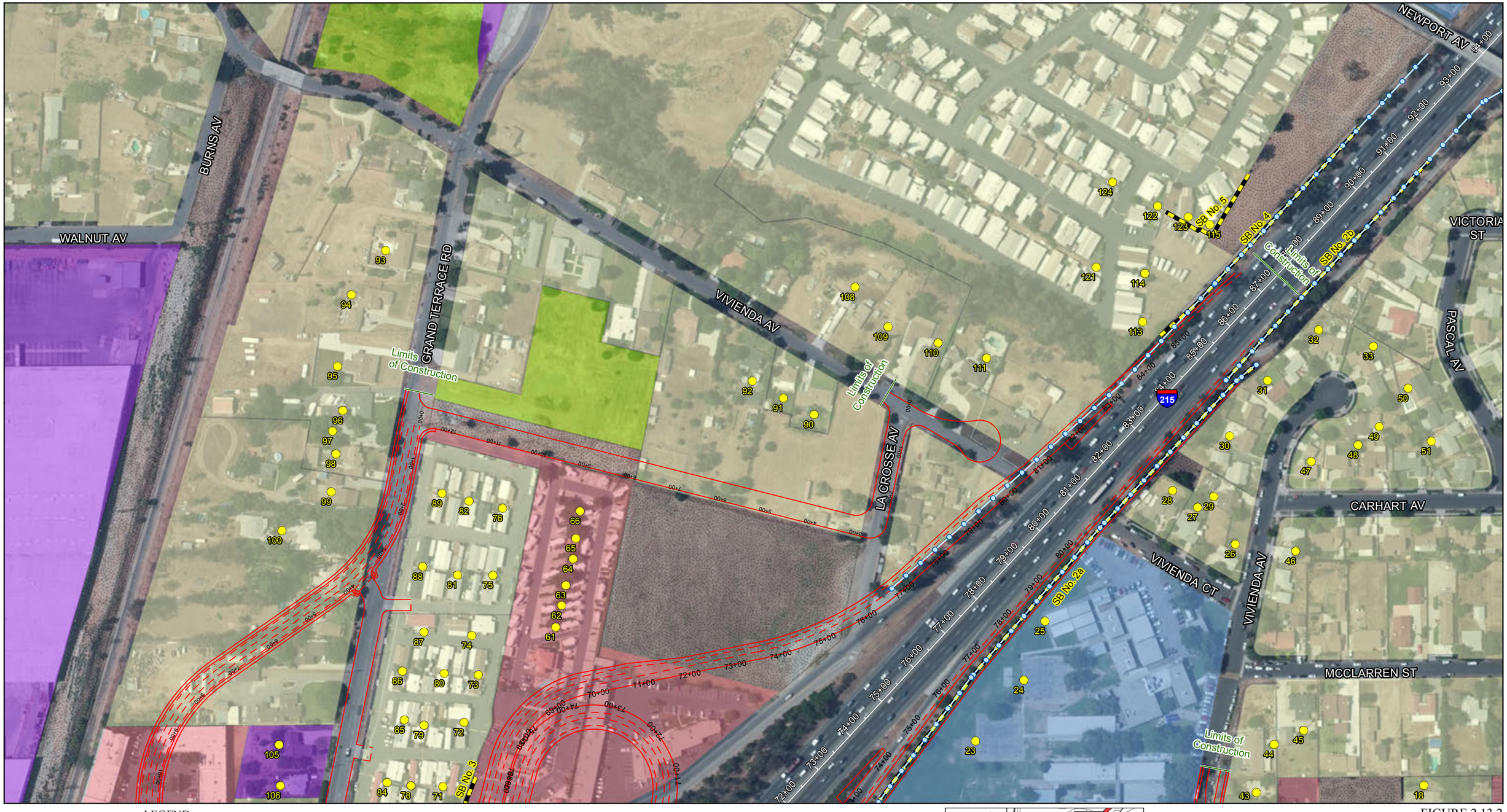

LEGEND

- Alternative 3
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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Note: Receivers R-39 to R-42, R-52 to R-59, R-119 to R-120, and R-129 to R-130 are not shown because they are located beyond the limits of construction under alternative 3.

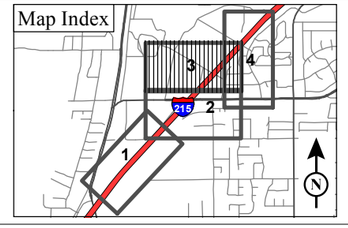


FIGURE 2.13.2
Sheet 3 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 3
Modeled Sound Barriers and Receiver Locations

This page intentionally left blank

LEGEND

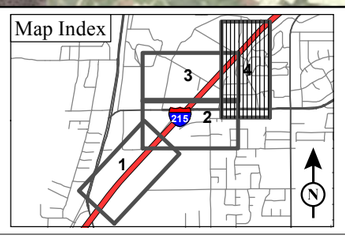
- Alternative 3
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

Map Index



SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); SCAG (2008); LSA (2011)

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Note: Receivers R-39 to R-42, R-52 to R-59, R-119 to R-120, and R-129 to R-130 are not shown because they are located beyond the limits of construction under alternative 3.

FIGURE 2.13.2
Sheet 4 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 3
Modeled Sound Barriers and Receiver Locations

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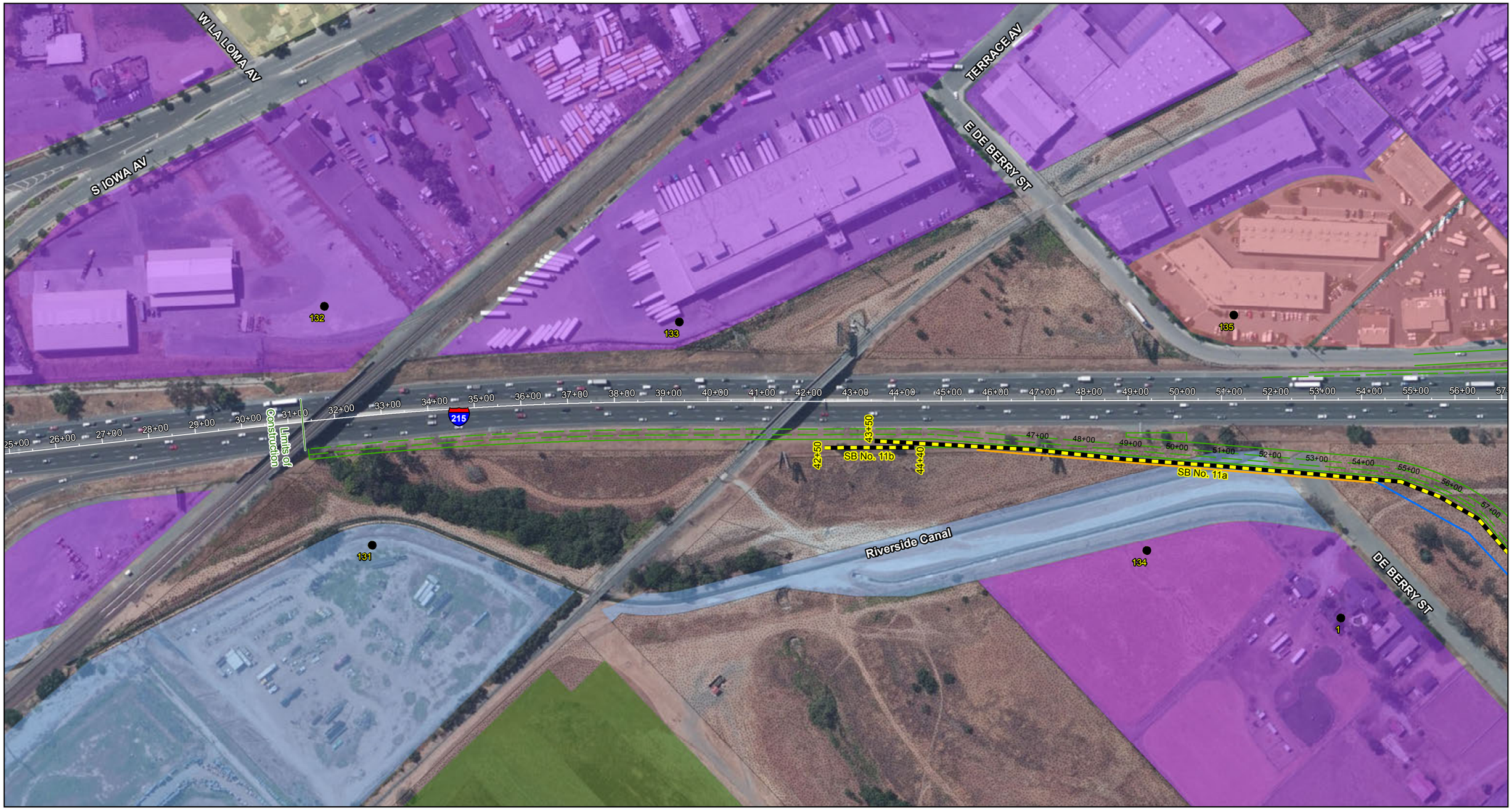

LEGEND

- Alternative 6
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); AECOM (5/2011)

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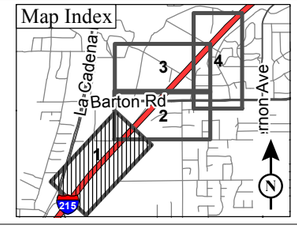
Map Index



Note: Receivers R-34 to R-42, R-52 to R-59, R-116 to R-120, and R-125 to R-130 are not shown because they are located beyond the limits of construction under Alternative 6.

FIGURE 2.13.3
Sheet 1 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 6
Modeled Sound Barriers and Receiver Locations

This page intentionally left blank

LEGEND

- Alternative 6
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); AECOM (5/2011)

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Note: Receivers R-34 to R-42, R-52 to R-59, R-116 to R-120, and R-125 to R-130 are not shown because they are located beyond the limits of construction under Alternative 6.

Map Index

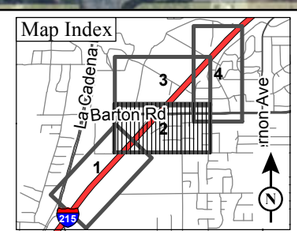

FIGURE 2.13.3
Sheet 2 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 6
Modeled Sound Barriers and Receiver Locations

This page intentionally left blank

LEGEND

- Alternative 6
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200 FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); AECOM (5/2011)

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Note: Receivers R-34 to R-42, R-52 to R-59, R-116 to R-120, and R-125 to R-130 are not shown because they are located beyond the limits of construction under Alternative 6.

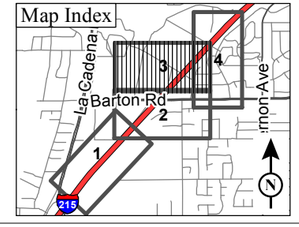

FIGURE 2.13.3

Sheet 3 of 4

I-215/Barton Road Interchange Improvement Project

Alternative 6

Modeled Sound Barriers and Receiver Locations

This page intentionally left blank

LEGEND

- Alternative 6
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Receiver Location
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (05/2010); County of San Bernardino (5/09); AECOM (5/2011)

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Note: Receivers R-34 to R-42, R-52 to R-59, R-116 to R-120, and R-125 to R-130 are not shown because they are located beyond the limits of construction under Alternative 6.

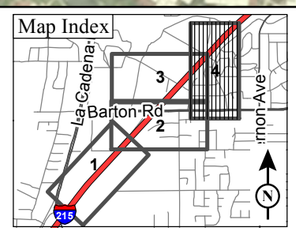

FIGURE 2.13.3
Sheet 4 of 4

I-215/Barton Road Interchange Improvement Project
Alternative 6
Modeled Sound Barriers and Receiver Locations

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W LA LOMA AV
S IOWA AV
BNSF Railway
TERRACE AV
E DE BERRY ST
UP Railroad
DE BERRY ST
Riverside Canal
Limits of Construction
SB No. 22b
SB No. 22a
42+50
43+50
44+40
25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00
12+00 13+00 14+00 15+00 16+00 17+00
131
132
133
134
135
1

LEGEND

- Modified Alternative 7
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Modeled Receiver Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); AECOM (3/2013)

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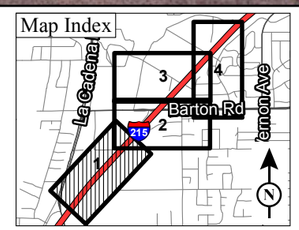
Map Index



Note: Receivers R-36 to R-42, R-52 to R-59, R-118 to R-120, R-128 to R-130, and R-144 are not shown because they are located beyond the limits of construction under Modified Alternative 7.

FIGURE 2.13.4
Sheet 1 of 4

I-215/Barton Road Interchange Improvement Project

Modified Alternative 7 (Preferred Alternative)
Modeled Sound Barriers and Receiver Locations

This page intentionally left blank

LEGEND

- Modified Alternative 7
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Modeled Receiver Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); AECOM (3/2013)

I:\SBA330\Barton_I-215\GIS\ISEA\NoiseAnalysis_Alt7M_Mapbook.mxd (2/24/2014)

Note: Receivers R-36 to R-42, R-52 to R-59, R-118 to R-120, R-128 to R-130, and R-144 are not shown because they are located beyond the limits of construction under Modified Alternative 7.

Map Index

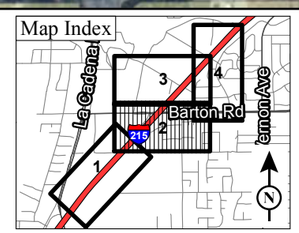


FIGURE 2.13.4
Sheet 2 of 4

I-215/Barton Road Interchange Improvement Project

Modified Alternative 7 (Preferred Alternative)
Modeled Sound Barriers and Receiver Locations

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LEGEND

- Modified Alternative 7
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Sound Barrier
- Modeled and Planned Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Modeled Receiver Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200 FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); AECOM (3/2013)

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Note: Receivers R-36 to R-42, R-52 to R-59, R-118 to R-120, R-128 to R-130, and R-144 are not shown because they are located beyond the limits of construction under Modified Alternative 7.

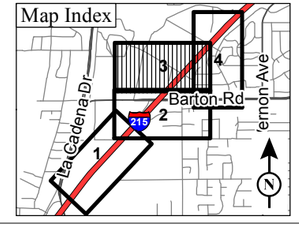

FIGURE 2.13.4
Sheet 3 of 4

I-215/Barton Road Interchange Improvement Project

Modified Alternative 7 (Preferred Alternative)
Modeled Sound Barriers and Receiver Locations

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LEGEND

- Modified Alternative 7
- Proposed Right of Way
- Temporary Construction Easement
- Limits of Construction
- Modeled Sound Barrier
- I-215 Bi-County HOV Lane Gap Closure Project Sound Barrier
- Modeled Receiver Location

Existing Land Use

- Agriculture
- Residential
- Commercial
- Industrial
- Utilities & Public Facilities
- Open Space and Recreation
- Vacant

0 100 200
FEET

SOURCE: Microsoft (5/2010); County of San Bernardino (5/09); AECOM (3/2013)

I:\SBA330\Barton_I-215\GIS\ISEA\NoiseAnalysis_Alt7M_Mapbook.mxd (2/24/2014)

Note: Receivers R-36 to R-42, R-52 to R-59, R-118 to R-120, R-128 to R-130, and R-144 are not shown because they are located beyond the limits of construction under Modified Alternative 7.

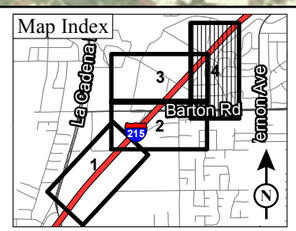

FIGURE 2.13.4
Sheet 4 of 4

I-215/Barton Road Interchange Improvement Project

Modified Alternative 7 (Preferred Alternative) | Modeled Sound Barriers and Receiver Locations

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2.13.4.3 Sound Barrier Reasonableness

The reasonableness of a sound barrier is determined by comparing the estimated cost of the sound barrier construction against the total reasonable allowance. The total reasonable allowance is determined based on the number of benefited residences multiplied by the reasonable allowance per residence. Additionally, in accordance with the Caltrans Traffic Noise Analysis Protocol, each sound barrier must provide at least 7 dBA of noise reduction at one or more benefited receiver(s) to be considered reasonable. Therefore, if the estimated sound barrier construction cost exceeds the total reasonable allowance or was not predicted to provide at least 7 dBA of noise reduction at one or more benefited receiver, the sound barrier is determined to be not reasonable. However, if the estimated sound barrier construction cost is within the total reasonable allowance and is predicted to provide at least 7 dBA of noise reduction at one or more benefited receiver, the sound barrier is determined to be reasonable. Based on this methodology it was determined that SB Nos. 2a & 2b, 5, 12a & 12b, 13, 23a & 23b, and 26 are reasonable as shown in Table 2.13.K.

Table 2.13.K Feasible and Reasonable Sound Barriers

Alternative	Sound Barrier No.	Recommended Height (ft)	Approximate Length (ft)	Number of Benefited Units[1]	Noise Attenuation Range (dBA)	Sound Barrier Location	Total Reasonable Allowance	Estimated Sound Barrier Construction Cost[2]
3	2a & 2b	14	2,086	25	5-14	Within State right of way	$770,000	$708,000
	5	16	270	3	6-8	Residential Property Line	$165,000	$133,000
6	12a & 12b	14	1,985	24	5-14	Within State right of way	$1,320,000	$1,131,000
	13	16	926	48	5-10	State right of way	$2,640,000	$466,000
Modified 7 (Preferred Alternative)	23a & 23b	14	2,160	3	5-12	Within State right of way	$1,595,000	$1,211,000
	26[3]	16	353	5	6-8	Residential Property Line	$275,000	$170,000

Sources: *Noise Abatement Decision Report*, May 2012; *Supplemental Noise Abatement Report* (October 2013).

1 Number of units attenuated by 5 dBA or more by the modeled barrier (e.g., a unit is a single-family dwelling, ground-floor apartment, or school).

2 Sound barrier construction cost information provided by AECOM.

3 SB No. 26 would not be constructed because receivers protected by this barrier would be protected by SB No. 25, which is being constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project (EA No. 0M940).

The I-215 Bi-County HOV Lane Gap Closure Project will construct two sound barriers: (1) along the I-215 northbound on-ramp (same location and height as

SB Nos. 2a & 2b for Alternative 3, SB Nos. 12a & 12b for Alternative 6, and SB Nos. 23a & 23b for Modified Alternative 7); and (2) along the I-215 southbound off-ramp (same location and height as SB No. 4 for Alternative 3, SB No. 14 for Alternative 6, and SB No. 25 for Modified Alternative 7). The sound barrier constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project will meet the noise abatement requirements for the I-215/Barton Road Interchange Project at the corresponding impacted receivers shown in Tables 2.13.G, 2.13.I and 2.13.J.

For Alternative 3, SB No. 5 was analyzed as an alternate barrier to SB No. 4 and found to be reasonable and feasible (refer to Table 2.13.G). However, in the same location at the same height is a sound barrier that is being constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project. Therefore, SB No. 5 is not necessary.

SB No.13 for Alternative 6 was found to be reasonable and feasible. Furthermore, the southbound off-ramp sound barrier that would be constructed as part of the I-215 Bi-County HOV Lane Gap Closure Project would not reduce noise levels in this location. Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of a barrier at the State right of way with a length of 926 ft, at an average height of 16 ft for Alternative 6 (SB No. 13) as shown in Table 2.13.K. Calculations based on preliminary design data indicate that this barrier would reduce noise levels by 5 to 10 dBA for 48 residences at a cost of $434,000.

If during final design, conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the Project design and the public involvement processes.

According to federal policies, before a sound barrier can be constructed on Caltrans right of way, written agreement must be provided by at least 50 percent of the affected property owners. Consistent with the Caltrans Traffic Noise Analysis Protocol, sound barrier surveys were distributed to each property owner adjacent to SB No. 13 (for Alternative 6) to determine if the property owner was in favor of this sound barrier. No other sound barrier surveys were sent because the I-215 Bi-County HOV Lane Gap Closure Project sound barriers were previously approved by the adjacent property owners.

Sound barrier surveys were sent to the property owners of Grand Terrace Mobile Home Park (Assessor's Parcel Number [APN] 0275-231-28) and Terrace Village RV Park (APN 0275-231-69), which would be impacted under Alternative 6, on

November 26, 2013, and were delivered on November 27, 2013. Sound barrier surveys were not sent to the occupants of Grand Terrace Mobile Home Park, which is required by the May 2011 Caltrans Traffic Noise Analysis Protocol.

The distributed sound barrier surveys were not returned during the public review period. On January 14, 2014, a telephone call was made to the property owner of Grand Terrace Mobile Home Park, DNA Residential Properties LLC. The calls were directed to the corporate office, then to the property manager, and finally to the on-site manager, Bob Robbins. A voicemail was left for Mr. Robbins and no response was received. Mr. Robbins did attend the public hearing on December 12, 2013.

On January 14, 2014, a voicemail was left for Tom Murdock, the owner of Terrace Village RV Park. On January 23, 2014, Mr. Murdock left a voicemail requesting an additional copy of the sound barrier survey. He said he must have thrown it out since he knew that Modified Alternative 7 was Locally Preferred by the City of Grand Terrace and the San Bernardino Associated Governments (SANBAG) (Mr. Murdock attended the public hearing on December 12, 2013). A duplicate letter and survey were sent to Mr. Murdock on January 27, 2014. On February 5, 2014, a follow-up call was conducted, and the status of the project and the sound barrier survey was discussed with Mr. Murdock. Mr. Murdock was not sure if he wanted a sound barrier. He was advised that Caltrans had recently identified Modified Alternative 7 as the preferred alternative, and he indicated that he may or may not return the sound barrier survey. Mr. Murdock returned the duplicate survey to SANBAG, but did not indicate on the survey whether or not he wanted a sound barrier.

Alternative 6 was not identified as the Preferred Alternative, and there is no expectation of changes to Modified Alternative 7, the Preferred Alternative for the Project, during completion of Final Design for the Project, such that a sound barrier comparable to SB No. 13 would need to be evaluated. However, if changes to the design of Modified Alternative 7 do occur during Final Design that may require further analysis or outreach regarding potential noise impacts, all requirements will be satisfied in accordance with current applicable standards. This may include distribution of sound barrier surveys to occupants of Grand Terrace Mobile Home Park, consistent with the requirements of the May 2011 Caltrans Traffic Noise Analysis Protocol.

The following measures are required to minimize substantial construction noise impacts:

N-1 **Noise Control, Caltrans SSP 14-8.02.** The control of noise from construction activities within the California Department of Transportation (Caltrans) right of way will conform to the Caltrans Standard Special Provisions (SSP), Section 14-8.02, "Noise Control." The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., will not exceed 86 A-weighted decibels (dBA) at a distance of 50 feet (ft). The Contractor will use an alternative warning method instead of a sound signal unless required by safety laws. In addition, the Contractor will equip all internal combustion engines with the manufacturer-recommended muffler and will not operate any internal combustion engine on the job site without the appropriate muffler.

N-2 **Construction Noise Standards.** In accordance with the City of Colton Bid and Contract template and the City of Grand Terrace Municipal Code, construction activities within the City of Colton will be limited to between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday, excluding weekends and holidays, and within the City of Grand Terrace, construction activities will be limited to between the hours of 7:00 a.m. and 8:00 p.m., Monday through Friday, excluding weekends and holidays.

N-3 **Noise Abatement.** If there is a change in the Preferred Alternative, and the Project proceeds to construction based on Alternative 6, a sound barrier with a length of 926 ft and an average height of 16 ft (Sound Barrier [SB] No. 13) would be planned to be constructed at the State right of way based on Alternative 6 in conjunction with final design.

N-4 **Sound Barrier Reconstruction.** The portion the of the sound barrier constructed as part of the Interstate (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, located adjacent to the Grand Royal Mobile Estates, to be removed during project construction will be reconstructed along the planned new State right of way line based on Modified Alternative 7 in conjunction with final design.

BIOLOGICAL ENVIRONMENT

2.14 Natural Communities

2.14.1 Regulatory Setting

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species Section 2.18. Wetlands and other waters are also discussed below in Section 2.15.

2.14.2 Affected Environment

This section is based on the *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013) prepared for the Project.

2.14.2.1 Biological Study Area

The study area that is assessed for biological resources is referred to as the Biological Study Area (BSA). The BSA is shown on Figure 2.14.1. The BSA represents the area of potential direct and indirect Project impacts to biological resources and includes the ground disturbance area associated with the interchange, including the grading limits and staging areas. The BSA includes areas of potential direct impact, but also extends beyond the maximum extent of potential direct impact where necessary to identify sensitive biological resources within and adjacent to the Project area.

2.14.2.2 Natural Communities

The BSA supports three habitat types or vegetation classifications. Figure 2.14.1 shows the location of each vegetation classification in the BSA. The two dominant vegetation types in the BSA are nonnative ruderal vegetation and developed areas dominated by ornamental vegetation (Developed/Ornamental). The third vegetation type present in the BSA is riparian woodland.

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LEGEND

Biological Study Area

Vegetation

- Ruderal field
- Riparian habitat
- Developed/Ornamental
- Drainage Centerline

0 150 300
FEET

SOURCE: Microsoft (5/2010)

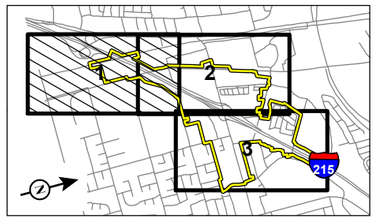

FIGURE 2.14.1
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Vegetation

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LEGEND

Biological Study Area

Vegetation

- Ruderal field
- Riparian habitat
- Developed/Ornamental
- Drainage Centerline

0 150 300
FEET

SOURCE: Microsoft (5/2010)

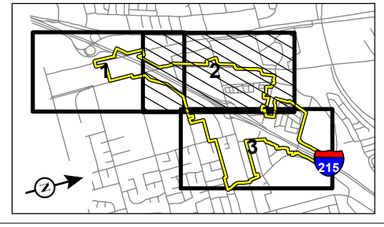

FIGURE 2.14.1
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Vegetation

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LEGEND

Biological Study Area

Vegetation

- Ruderal field
- Riparian habitat
- Developed/Ornamental
- Drainage Centerline

0 150 300
FEET

SOURCE: Microsoft (5/2010)

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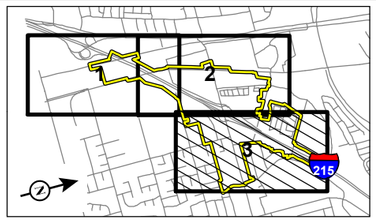

FIGURE 2.14.1
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Vegetation

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2.14.2.3 Developed/Ornamental

The majority of the BSA is developed and is dominated by ornamental plantings consisting of introduced plant species used for landscaping purposes. There is a total of 194.8 acres (ac) of developed/ornamental areas within the BSA. Species within this vegetation/land use type include Bermuda grass (*Cynodon dactylon*), ornamental pine (*Pinus* sp.), eucalyptus (*Eucalyptus* sp.), California fan palm (*Washingtonia filifera*), oleander (*Nerium oleander*), tree of heaven (*Ailanthus altissima*), and elm (*Ulmus* sp.).

Ruderal Vegetation

Ruderal vegetation is found throughout the BSA in the disked fields, vacant lots, and other undeveloped parcels. There is a total of 47.2 ac of ruderal vegetation within the BSA. Species within this vegetation classification are primarily nonnative species and consist of shortpod mustard (*Hirschfeldia incana*), London rocket (*Sisymbrium irio*), Russian thistle (*Salsola tragus*), morning glory (*Ipomoea* sp.), dove weed (*Croton setigerus*), cheeseweed (*Malva parviflora*), wild oat (*Avena fatua*), rescue grass (*Bromus catharticus*), and foxtail barley (*Hordeum murinum*).

Riparian Woodland

There are two drainages with narrow isolated stands of riparian habitat totaling 2.7 ac within the BSA, along Drainages B and F. Drainage B is an earthen-lined channel that is separated into three segments of riparian habitat within the BSA. These stands of riparian habitat are located in the south part of the BSA, east of Interstate 215 (I-215), on either side of culverts under the Union Pacific Railroad (UPRR) and east of the BNSF Railway/I-215 bridge (Sheet 1 of Figure 2.14.1). Drainage B is moderately disturbed and contains riparian woodland habitat dominated by tree of heaven, velvet ash (*Fraxinus velutina*), and arroyo willow (*Salix lasiolepis*).

The other area of riparian habitat is located along an earthen drainage (Drainage F) in the north part of the BSA, west of I-215, approximately 1,000 feet (ft) south of Newport Avenue and 400 ft north of Vivienda Avenue (Sheets 2 and 3 of Figure 2.14.1). Species in this stand include Goodding's willow (*Salix gooddingii*), Mexican fan palm (*Washingtonia robusta*), castor bean (*Ricinus communis*), and edible fig (*Ficus carica*). Within the BSA, the drainage is highly disturbed and contains numerous exotic species. The drainage is bounded by a trailer park to the north and residential development to the south. Within the BSA, the drainage has an overstory of riparian woodland species, primarily consisting of Goodding's willow;

however, the channel bottom is covered in a concrete slurry pad for erosion protection at the I-215 culvert outlet.

2.14.2.4 Wildlife Corridors

As described above, the BSA is characterized predominantly by ruderal and ornamental vegetation. Wildlife species occurring within the BSA are characteristic of those found within developed and disturbed habitats. The Project area does not function as a wildlife movement corridor. The interchange is within a highly developed area, and there are no adjacent native habitat areas that wildlife would access by passing through the Project area. Drainage B consists of exotic species and is not contiguous with other riparian habitat. Drainage F is highly disturbed and constrained by development and fences on either side. Larger mammals would not likely use either drainage as a wildlife corridor due to access constraints posed by the fencing and the culvert under I-215.

2.14.3 Environmental Consequences

The project area for the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project overlaps with the Project area for the I-215/Barton Road Interchange Improvement Project. The I-215 Bi-County HOV Lane Gap Closure Project is currently under construction and will be completed by early 2015, prior to construction of the I-215/Barton Road Interchange Improvement Project.

2.14.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, no temporary impacts to natural communities would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Alternatives 3, 6, and Modified Alternative 7 would not result in temporary impacts to the native vegetation communities associated with Drainages B and F and would only temporarily impact Developed/Ornamental and Ruderal Vegetation communities.

Temporary indirect impacts include potential impacts to adjacent habitats caused by storm water runoff and litter. Storm water and litter impacts would be avoided through compliance with the Construction General Permit and implementation of Project-specific best management practices (BMPs) as required in Measure WQ-1 (Section 2.8). Therefore, no substantial temporary indirect impacts would occur.

As described above, the Project area and drainages do not function as wildlife movement corridors. Therefore, construction of the Build Alternatives would not result in temporary impacts to wildlife corridors.

2.14.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to natural communities would occur.

Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will permanently impact 0.05 ac of riparian habitat (0.04 ac in Drainage B and 0.01 ac in Drainage F). This approved project includes mitigation measures and Regulatory Permits to mitigate impacts to natural communities, and no substantial impacts will occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

The I-215 Bi-County HOV Lane Gap Closure Project will widen I-215 where Drainage B passes below the freeway. Based on the final design plans for the I-215 Bi-County HOV Lane Gap Closure Project, no additional widening into Drainage B would be required for the I-215/Barton Interchange Improvement Project; therefore, Alternatives 3, 6, and Modified Alternative 7 would not result in permanent impacts to Drainage B. Similarly, the I-215 Bi-County HOV Lane Gap Closure Project will impact Drainage F in order to construct a sound barrier. Because this sound barrier will already be constructed as part of the HOV project, the I-215/Barton Interchange Improvement Project would not permanently impact Drainage F. Only Developed/ Ornamental and Ruderal Vegetation communities will be permanently affected by the Build Alternatives.

Potential permanent indirect impacts include degradation of adjacent riparian habitat from storm water runoff, traffic, and litter. In addition, construction has the potential to indirectly affect riparian habitat permanently through enhancing the germination and proliferation of nonnative invasive plant species. Storm water and litter indirect impacts would be avoided through compliance with the California Department of Transportation (Caltrans) Storm Water Management Plan (SWMP), the Caltrans and City National Pollutant Discharge Elimination System (NPDES) permits, and implementation of Project-specific BMPs as required in Measure WQ-2 (Section 2.8). Control of invasive plant species requires revegetation with plant species native to the

area, adherence to a weed abatement and control program, and compliance with pollution and litter laws and regulations as specified in Measure INV-1 (Section 2.19). Implementation of these measures would avoid or minimize permanent indirect impacts to riparian habitat, and no substantial impacts would occur.

As discussed in Sections 2.5, 2.12, and 2.20, Alternatives 3, 6, or Modified Alternative 7 would reduce local traffic congestion, and regional exhaust emissions would be the same as the No Build Alternative or would increase slightly. Therefore, the Build Alternatives would not cause new indirect impacts to natural communities from exhaust.

As described above, the Project area and drainages do not function as wildlife movement corridors. Therefore, construction of any of the Build Alternatives would not result in permanent impacts to wildlife corridors.

2.14.4 Avoidance, Minimization, and/or Mitigation Measures

Measures WQ-1 and WQ-2, presented in Section 2.8, Water Quality and Storm Water Runoff, and Measure INV-1, presented in Section 2.19, Invasive Species, would minimize impacts to natural communities. No additional avoidance, minimization, and/or mitigation measures are required or proposed.

2.15 Wetlands and Other Waters

2.15.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the United States Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits. Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 CFR Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the

USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCB) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or Tahoe Regional Planning Agency) may also be involved. Sections 1600–1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for additional details.

2.15.2 Affected Environment

This section is based on the *Natural Environment Study* (Minimal Impacts) (NES[MI]) (October 2013) and the *Jurisdictional Delineation* (June 2011) prepared for the Project.

The findings and conclusions of the Jurisdictional Delineation are considered preliminary until verified by the CDFW and the RWQCB during the permit process.

The study area for wetlands and other waters is the Jurisdictional Study Area (study area), which represents the area of potential Project impacts and includes the ground disturbance area associated with the interchange, including the grading limits and staging areas. The Jurisdictional Study Area is depicted on Figure 2.15.1.

There are six water features located within the study area (referred to as Drainages A through F). These drainages are shown on Figure 2.15.1 and are described below.

The Riverside Canal Aqueduct (Drainage A) is a concrete channel in the southeast part of the study area that conveys groundwater pumped from wells in Colton by the City of Riverside, solely for irrigation purposes and is not diverted into waters of the United States (U.S.).

Drainage B (Highgrove Channel), in the southeast part of the study area, conveys flows from a storm drain system to the south into an earthen-lined channel with culverts under railroad tracks and under Interstate 215 (I-215). Drainage B conveys flows into the Santa Ana River near the San Bernardino/Riverside County line, approximately 3 miles (mi) to the southwest. Portions of Drainage B are vegetated with riparian habitat, as shown in Figure 2.15.1.

Drainage C is a concrete trapezoidal ditch located east of the northbound I-215 exit ramp. Drainage C receives flows from under Barton Road (from the storm drain system) and a small amount of runoff from Barton Road itself. Drainage C is approximately 250 feet (ft) long and conveys flows into another underground storm drain system.

Two concrete ditches (Drainages D and E) on either side of I-215 convey flows along the northern portion of the study area into an earthen channel (Drainage F) described below. Drainage D is a concrete v-ditch that conveys ephemeral flows along the top of the slope adjacent to southbound I-215 and outlets onto a concrete slurry pad

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LEGEND

- Jurisdictional Study Area
- Earthen / Vegetated Channel (Wetland Waters)
- Earthen / Vegetated Channel (Non-Wetland Waters)
- Lined Channel (Non-Wetland Waters)
- Lined Channel (Non-Jurisdictional Waters)
- Soil Test Pit (with ID)
- USACE/CDFW Jurisdictional Width
- Riparian habitat (CDFW Jurisdiction)

0 150 300
FEET

SOURCE: Microsoft (5/2010)

NOTE: USACE jurisdictional width is based on Ordinary High Water Mark; CDFW jurisdictional width is based on bank to bank of streambed and includes any associated riparian habitat.

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FIGURE 2.15.1
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Potential USACE/CDFW Jurisdictional Areas

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LEGEND

- Jurisdictional Study Area
- Earthen / Vegetated Channel (Wetland Waters)
- Earthen / Vegetated Channel (Non-Wetland Waters)
- Lined Channel (Non-Wetland Waters)
- Lined Channel (Non-Jurisdictional Waters)
- Soil Test Pit (with ID)
- USACE/CDFW Jurisdictional Width
- Riparian habitat (CDFW Jurisdiction)

0 150 300
FEET

SOURCE: Microsoft (5/2010)

NOTE: USACE jurisdictional width is based on Ordinary High Water Mark; CDFW jurisdictional width is based on bank to bank of streambed and includes any associated riparian habitat.

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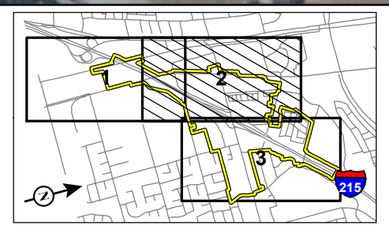

FIGURE 2.15.1
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Potential USACE/CDFW Jurisdictional Areas

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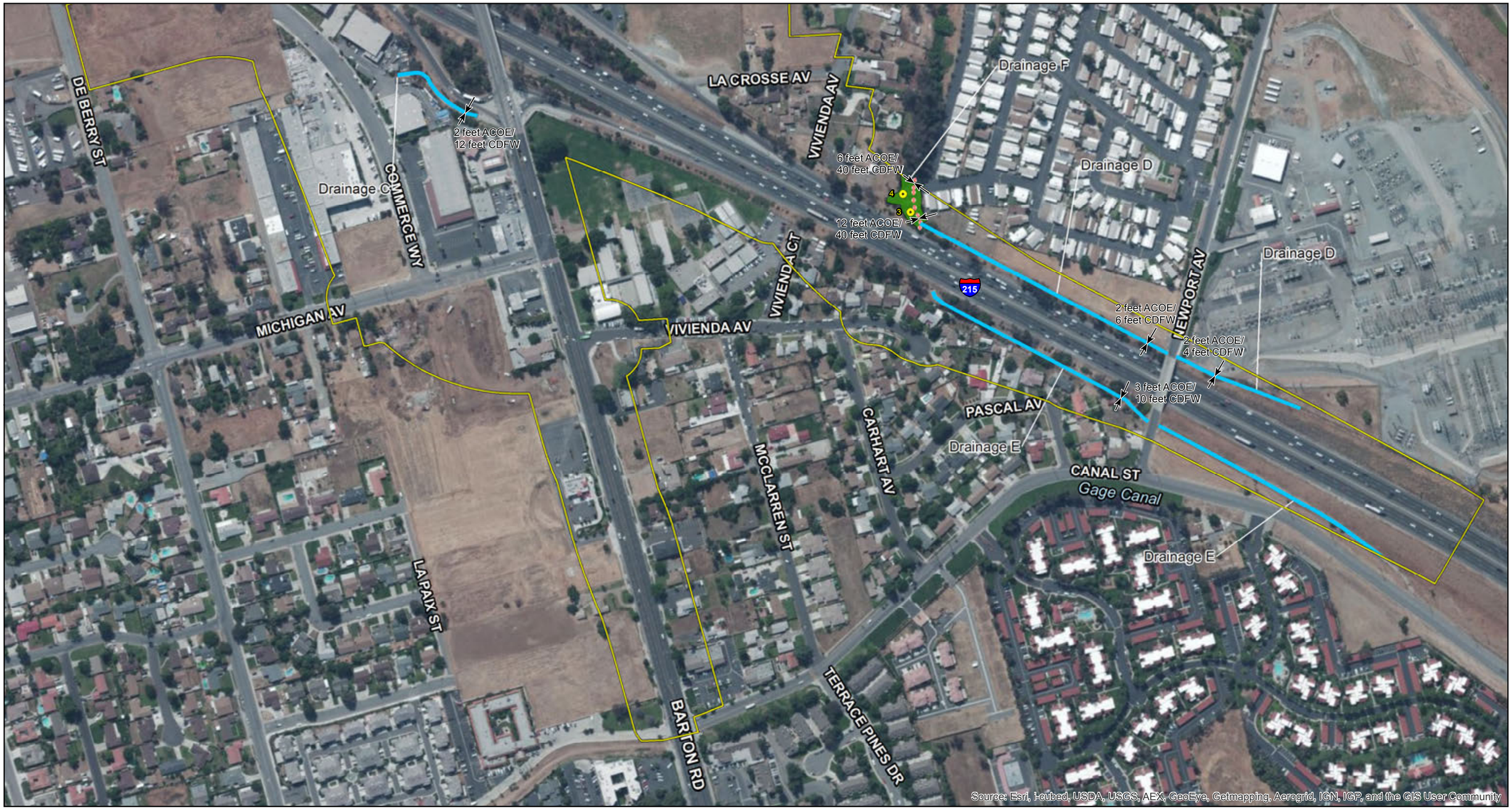

LEGEND

- Jurisdictional Study Area
- Earthen / Vegetated Channel (Wetland Waters)
- Earthen / Vegetated Channel (Non-Wetland Waters)
- Lined Channel (Non-Wetland Waters)
- Lined Channel (Non-Jurisdictional Waters)
- Soil Test Pit (with ID)
- USACE/CDFW Jurisdictional Width
- Riparian habitat (CDFW Jurisdiction)

0 150 300
FEET

SOURCE: Microsoft (5/2010)

NOTE: USACE jurisdictional width is based on Ordinary High Water Mark; CDFW jurisdictional width is based on bank to bank of streambed and includes any associated riparian habitat.

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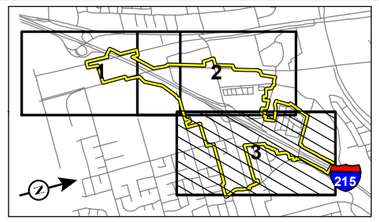

FIGURE 2.15.1
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Potential USACE/CDFW Jurisdictional Areas

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within the earthen drainage. Drainage E is a concrete trapezoidal ditch along the toe of slope above northbound I-215 and conveys intermittent flows through a culvert under I-215 onto the same concrete erosion control pad as Drainage F.

Drainage F is an earthen channel located west of I-215 and originates approximately 1,000 ft south of Newport Avenue and 400 ft north of Vivienda Avenue. Drainage F is vegetated with riparian habitat, as shown in Figure 2.15.1. The Drainage is highly disturbed, with nonnative species and a concrete erosion control pad at the base of the Drainage E culvert outlet under I-215 and at the base of the Drainage D outlet. Water from Drainage F is conveyed through the disturbed stand of riparian habitat and down the west side of the mesa landform. Although a connection to the Santa Ana River is not evident from the flow pattern, it is assumed that all flows eventually reach the Santa Ana River, a relatively permanent water body located less than 1 mi to the northwest.

2.15.2.1 Potential USACE Jurisdictional Areas

Drainage A is a concrete-lined aqueduct, is wholly excavated in uplands, and is not part of a surface tributary system to any navigable waters and, therefore, is not jurisdictional per 33 Code of Federal Regulations (CFR) 328.3.

All flows from Drainages B through F within the study area eventually reach the Santa Ana River. The Santa Ana River conveys flows generally southwest into Orange County and eventually into the Pacific Ocean. The Pacific Ocean is a navigable water of the U.S.; therefore, Drainages B through F each have an interstate commerce nexus and are considered potential USACE jurisdictional areas. As shown in Table 2.15.A, the total area of potential USACE nonwetland waters of the U.S. within the study area is 0.30 acre (ac). There is 0.04 ac of potential USACE jurisdictional wetlands (i.e., areas that satisfy all three criteria for USACE jurisdictional wetlands) present within Drainage B. Therefore, the total area of USACE jurisdiction within the study area is 0.34 ac (including 0.30 ac of nonwetland waters of the U.S. and 0.04 ac of wetlands). The potential USACE jurisdictional areas are shown on Figure 2.15.1.

2.15.2.2 CDFW Jurisdictional Areas

The area satisfying the USACE jurisdictional criteria for Waters of the U.S. (Drainages B through F), as described above, is also subject to CDFW jurisdiction. In addition, the width of the banks exceeding the ordinary high water mark and adjacent riparian areas extending beyond the limits of the banks are also considered subject to CDFW jurisdiction. As shown in Table 2.15.B, the total acreage of potential CDFW jurisdiction in the BSA is 1.34 ac.

Table 2.15.A Potential USACE Jurisdictional Area

Drainage	Nonwetland Area Within Study Area (ac)	Wetland Area Within Study Area (ac)	Total Acreage
A	N/A	N/A	N/A
B	0.08	0.04	0.12
C	0.01	N/A	0.01
D	0.06	N/A	0.06
E	0.12	N/A	0.12
F	0.04	N/A	0.04
Total	**0.30**	**0.04**	**0.34**

Source: *Jurisdictional Delineation* (June 2011).

Table 2.15.B Potential CDFW Jurisdictional Area

Drainage	Streambed and Associated Riparian Habitat Within the Study Area (ac)
A	N/A
B	0.47
C	0.09
D	0.16
E	0.38
F	0.24
Total	**1.34**

Source: *Jurisdictional Delineation* (June 2011).

2.15.2.3 RWQCB Jurisdictional Areas

Pursuant to Section 401 of the CWA, RWQCB asserts jurisdiction over areas meeting the federal definition of wetlands and other waters of the U.S. Therefore, the potential USACE jurisdictional areas discussed above (Drainages B through F) would also be under the jurisdiction of the RWQCB.

2.15.2.4 Functions and Values

The following is an assessment of the functions and values attributable to the potential jurisdictional drainages in the Jurisdictional Study Area. All wetlands and other waters have some degree of functionality, and no single wetland can perform all of the functions considered below. The following functions exist at low or moderate levels in the identified jurisdictional areas in the Jurisdictional Study Area. The functions and values of the concrete-lined ditches are all considered to be low, and the functions and values of the earthen-lined drainages (Drainages B and F) range from low to high.

Groundwater Discharge/Recharge

Portions of the jurisdictional waters in the study area are the product of runoff from I-215 and suburban land uses. The concrete ditches do not allow for groundwater recharge. The earthen drainages allow for recharge of groundwater but likely do not play a large role in groundwater discharge. Therefore, this is considered a low-level function of Drainages B and F.

Flood Flow Alteration

The concrete-lined ditches (Drainages C, D, and E) are artificially created structures in an urban area that are designed to accommodate high flows. The earthen channels (Drainages B and F) function to slow water and fill up to provide temporary storage. Therefore, flood flow alteration is considered a moderate- to high-level function of these potentially jurisdictional waters.

Sediment Stabilization

Sediment stabilization is a low- to moderate-level function of the jurisdictional waters in the study area. The earthen drainages (Drainages B and F) can slow flows and allow sediment to stabilize due to the gradual slope and vegetation within the channel. The sediment stabilization function is not a function of the concrete-lined channels (Drainages C, D, and E).

Sediment/Toxicant Retention

No wetland vegetation is present in the concrete-lined drainages (Drainages C, D, and E). There is only minimal evidence of newly deposited sediment in the earthen drainages (Drainages B and F). The main channel of Drainage B is largely unvegetated, with a dense canopy of trees lining the steeply sloped banks. Wetland vegetation, such as tall flatsedge, is located in Drainage F within and downstream of the study area and may function to remove toxics. However, the main channel closest to I-215 consists of fringed willow herb (*Epilobium ciliatum*), rabbitsfoot grass (*Polypogon monspieliensis*), and castor bean (*Ricinus communis*). Therefore, this is considered a low- to moderate-level function for Drainages B and F.

Nutrient Removal/Transformation

The only wetland in the study area is along Drainage B by I-215. Minimal herbaceous vegetation (consisting of fringed willow herb and rabbitsfoot grass) is present within this drainage, which would result in minimal nutrient removal and transformation. At the downstream end of the study area along Drainage F, there were some hydrophytic herbaceous plant species that may function to provide nutrient removal and

transformation. This is considered a low- to moderate-level function for Drainages B and F. There is no nutrient removal/transformation associated with the concrete-lined drainages (Drainages C, D, and E).

Wildlife Habitat

There is some evidence of wildlife use of the vegetation associated with the earthen drainages (Drainages B and F). However, the habitat is highly disturbed by nonnative plant species and surrounded by development. Wildlife using the drainages would be common to urban areas. Thus, wildlife habitat is a low- to moderate-level function for Drainages B and F. There is no wildlife habitat associated with the concrete-lined drainages (Drainages C, D, and E).

Uniqueness/Heritage

There is nothing unique or of any social significance about any of the drainages. Therefore, this is considered a low-level value in the study area.

Recreation

The drainages in the study area are surrounded by the freeway, roads, and commercial and other developed uses and do not provide any recreational opportunities. Recreation is, therefore, considered a low-level value for all of the drainages.

2.15.3 Environmental Consequences

The project area for the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project overlaps with the Project area for the I-215/Barton Road Interchange Improvement Project. The I-215 Bi-County HOV Lane Gap Closure Project is currently under construction and will be completed by early 2015, prior to construction of the I-215/Barton Road Interchange Improvement Project.

2.15.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area. Therefore, no temporary impacts to wetlands or other waters would occur.

Alternative 3 (Partial Cloverleaf Interchange)

To minimize temporary direct impacts to jurisdictional waters, drainage improvements would primarily be constructed from existing roadways. As shown in Tables 2.15.C and 2.15.D, Alternative 3 would not result in temporary direct impacts to USACE, CDFW, or RWQCB jurisdiction.

Table 2.15.C Temporary Impacts to Potential USACE Jurisdictional Areas

	Alternative 3 (ac)	Alternative 6 (ac)	Modified Alternative 7 (Preferred Alternative) (ac)
Wetland Areas			
Drainage B (Highgrove Channel)	0	0	0
Nonwetland Areas			
Drainage C	0	0	0
Drainage D	0	0	0
Drainage E	0	0	<0.01
Drainage F	0	0	0
Total Impacts to Potential USACE Jurisdiction	**0**	**0**	**<0.01**

Source: *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013).

Table 2.15.D Temporary Impacts to Potential CDFW Jurisdictional Areas

	Alternative 3 (ac)	Alternative 6 (ac)	Modified Alternative 7 (Preferred Alternative) (ac)
Drainage B (Highgrove Channel)	0	0	0
Drainage C	0	0	0
Drainage D	0	0	0
Drainage E	0	0	<0.01
Drainage F	0	0	0
Total Impacts to Potential CDFW Jurisdiction	**0**	**0**	**<0.01**

Source: *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013).

Potential temporary indirect impacts to jurisdictional areas include impacts to water quality caused by litter or pollutants in construction storm water runoff. During construction activities, best management practices (BMPs) would be implemented to ensure that erosion caused by construction activities does not occur and that sediment is not deposited in the drainages.

A Storm Water Pollution Protection Plan (SWPPP) would be prepared and would specify the BMPs to be implemented as required in Measure WQ-1 (Section 2.8). Storm water and litter impacts would be avoided through compliance with the Construction General Permit and implementation of Project-specific BMPs as

required in Measure WQ-1. Therefore, temporary direct impacts to jurisdictional areas would not be substantial.

Alternative 6 (Modified Cloverleaf Interchange)

Like Alternative 3, to minimize impacts to jurisdictional waters, drainage improvements would primarily be constructed from existing roadways. As shown in Tables 2.15.C and 2.15.D, Alternative 6 would not result in temporary direct impacts to USACE, CDFW, or RWQCB jurisdiction.

Potential temporary indirect impacts to jurisdictional areas are the same as Alternative 3 and would be avoided or minimized through implementation of Measure WQ-1. Therefore, temporary indirect impacts to jurisdictional areas would not be substantial.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

Like Alternatives 3 and 6, to minimize impacts to jurisdictional waters, drainage improvements would primarily be constructed from existing roadways. However, Modified Alternative 7 would result in <0.01 ac of temporary impacts to USACE, RWQCB, and CDFW jurisdiction within Drainage E.

Although minor, impacts to the jurisdictional areas would require authorization from CDFW and RWQCB prior to construction as specified in Measures WET-1 and WET-2. Because Modified Alternative 7 would impact <0.1 ac of potential USACE jurisdictional non-wetland waters, a postconstruction notification is not required to be submitted to USACE. However, as specified in Measure WET-3, the Project will comply with the Nationwide Permit Program, pursuant to Section 404 of the federal CWA. During construction activities, BMPs will be implemented to ensure that erosion caused by construction activities does not occur and that sediment is not deposited in the storm drain system or adjacent drainages. With implementation of Measures WET-1 and WET-3, temporary direct impacts to jurisdictional areas would not be substantial.

Potential temporary indirect impacts to jurisdictional areas are the same as Alternatives 3 and 6, discussed above, and would be avoided or minimized through implementation of Measure WQ-1.

2.15.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to wetlands or other waters would occur.

Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. As shown in Tables 2.15.E and 2.15.F, the I-215 Bi-County HOV Lane Gap Closure Project would permanently impact 0.009 ac of USACE jurisdiction and 0.05 ac of CDFW jurisdiction. This approved project includes measures to mitigate impacts, and no substantial permanent impacts to wetlands and other waters will occur.

Table 2.15.E Permanent Impacts to Potential USACE Jurisdictional Areas

	Alternative 1 (ac)	Alternative 3 (ac)	Alternative 6 (ac)	Modified Alternative 7 (Preferred Alternative) (ac)
Wetland Areas				
Drainage B (Highgrove Channel)	0.007	0	0	0
Nonwetland Areas				
Drainage B	0	0	0	0
Drainage C	0	0.01	0	0.01
Drainage D	0	0	0	0
Drainage E	0	0	0	<0.01[1]
Drainage F	0.002	0	0	0
Total Impacts to Potential USACE Jurisdiction	**0.009**[2]	**0.01**	**0**	**0.01**

Sources: *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013); *NES for the I-215 Bi-County HOV Lane Gap Closure Project* (November 2010); *NES(MI) for the I-215/Newport Avenue Overcrossing Project* (June 2011).

[1] Although impacts would occur, they are well below 0.01 and, therefore, do not appear to be added to the total impacts that is rounded to two digits.

[2] Alternative 1 includes impacts to jurisdictional areas from the I-215 HOV Lane Gap Closure Improvement Project.

Table 2.15.F Permanent Impacts to Potential CDFW Jurisdictional Areas

	Alternative 1 (ac)	Alternative 3 (ac)	Alternative 6 (ac)	Modified Alternative 7 (Preferred Alternative) (ac)
Drainage B (Highgrove Channel)	0.04	0	0	0
Drainage C	0	0.08	0	0.08
Drainage D	0	0	0	0
Drainage E	0	0	0	<0.01[1]
Drainage F	0.01	0	0	0
Total Impacts to Potential CDFW Jurisdiction	**0.05**[2]	**0.08**	**0**	**0.08**

Sources: *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013); *NES for the I-215 Bi-County HOV Lane Gap Closure Project* (November 2010); *NES(MI) for the I-215/Newport Avenue Overcrossing Project* (June 2011).

[1] Although impacts would occur, they are well below 0.01 and, therefore, do not appear to be added to the total impacts that is rounded to two digits.

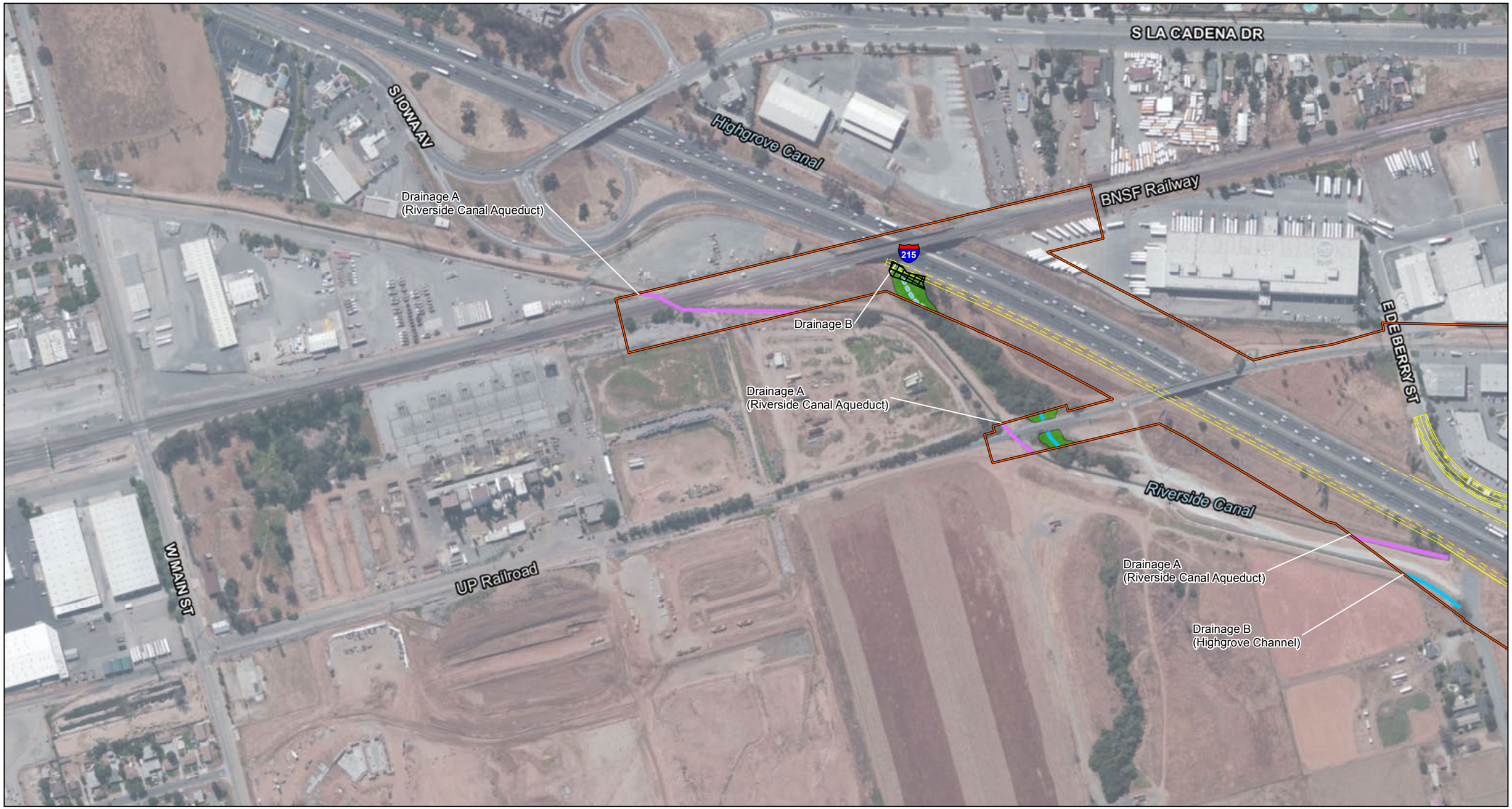
[2] Alternative 1 includes impacts to jurisdictional areas from the I-215 HOV Lane Gap Closure Improvement Project.

Alternative 3 (Partial Cloverleaf Interchange)

The I-215 Bi-County HOV Lane Gap Closure Project will widen I-215 where Drainage B passes below the freeway. Based on the final design plans for the I-215 Bi-County HOV Lane Gap Closure Project, no additional widening into Drainage B would be required for the I-215/Barton Interchange Improvement Project; therefore, the I-215/Barton Interchange Improvement Project would not result in permanent impacts to Drainage B. Similarly, the I-215 Bi-County HOV Lane Gap Closure Project will impact Drainage F in order to construct a sound barrier. Because this sound barrier will already be constructed as part of the HOV project, the I-215/Barton Interchange Improvement Project would not permanently impact Drainage F.

As shown in Tables 2.15.E and 2.15.F, and depicted on Figure 2.15.2, Alternative 3 would result in permanent impacts to 0.01 ac of potential USACE nonwetland areas and 0.08 ac of potential CDFW jurisdiction from replacement of the concrete ditch adjacent to the existing northbound off-ramp with an underground pipe. Impacts to potential RWQCB jurisdiction would be the same as impacts to potential USACE jurisdiction.

Although minor, impacts to the jurisdictional areas would require authorization from CDFW and RWQCB prior to construction as specified in Measures WET-1 and WET-2. Because Alternative 3 would impact <0.1 ac of potential USACE jurisdictional waters, postconstruction notification for compliance with the Nationwide Permit Program would be provided to the USACE as specified in Measure WET-3.



LEGEND

- Jurisdictional Study Area
- Alternative 3
- Permanent Impact to Potential Jurisdictional Areas
- I-215 Bi-County HOV Lane Gap Closure Project Impact Area
- CDFW Potential Jurisdictional Waters

USACE Potential Jurisdiction

- Wetland Waters
- Non-Wetland Waters

Non-Jurisdictional

- Non-Jurisdictional Waters

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SOURCE: Microsoft (5/2010); AECOM (8/2013)

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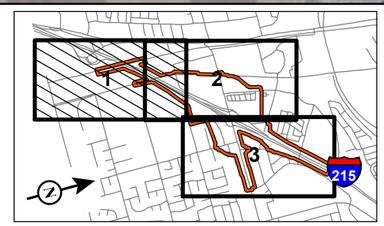

FIGURE 2.15.2
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Potential Jurisdictional Impacts - Alternative 3

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S LA CADENA DR
BNSF Railway
TERRACE AV
BARTON RD
WALNUT AV
BURNS AV
EDBERRY ST
UP Railroad
Riverside Canal
LA CROSSE AV
215
GRAND TERRACE RD
VIVIENDA AV
Drainage A
(Riverside Canal Aqueduct)
Drainage B
(Highgrove Channel)
Drainage F

LEGEND

- Jurisdictional Study Area
- Alternative 3
- Permanent Impact to Potential Jurisdictional Areas
- I-215 Bi-County HOV Lane Gap Closure Project Impact Area
- CDFW Potential Jurisdictional Waters

USACE Potential Jurisdiction
- Wetland Waters
- Non-Wetland Waters

Non-Jurisdictional
- Non-Jurisdictional Waters

0 150 300
FEET

SOURCE: Microsoft (5/2010); AECOM (8/2013)

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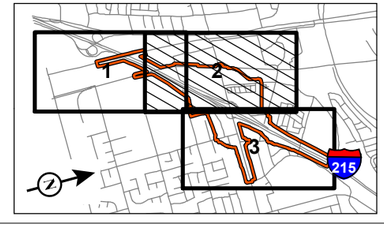

FIGURE 2.15.2
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Potential Jurisdictional Impacts - Alternative 3

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LEGEND

- Jurisdictional Study Area
- Alternative 3
- Permanent Impact to Potential Jurisdictional Areas
- I-215 Bi-County HOV Lane Gap Closure Project Impact Area
- CDFW Potential Jurisdictional Waters

USACE Potential Jurisdiction
- Wetland Waters
- Non-Wetland Waters

Non-Jurisdictional
- Non-Jurisdictional Waters

0 150 300
FEET

SOURCE: Microsoft (5/2010); AECOM (8/2013)

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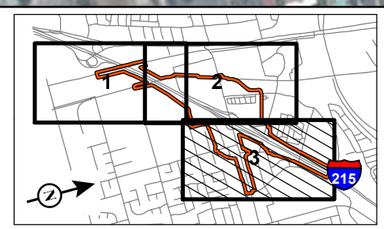

FIGURE 2.15.2
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Potential Jurisdictional Impacts - Alternative 3

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Compensatory mitigation is not anticipated. With implementation of Measures WET-1 through WET-3, permanent impacts to jurisdictional areas would not be substantial.

Potential indirect impacts to jurisdictional areas include impacts to water quality caused by litter or pollutants in operational storm water runoff and the indirect effect of germination and proliferation of nonnative invasive plant species. Storm water and litter indirect impacts would be avoided through compliance with the California Department of Transportation (Caltrans) Storm Water Management Plan (SWMP) and the Caltrans and City National Pollutant Discharge Elimination System (NPDES) permits and implementation of Project-specific BMPs as required in Measure WQ-2 (Section 2.8). Control of invasive plant species requires revegetation with plant species native to the area, adherence to a weed abatement and control program, and compliance with pollution and litter laws and regulations as specified in Measure INV-1 (Section 2.19). Implementation of these measures would avoid or minimize permanent indirect impacts to jurisdictional areas, and no substantial impacts would occur.

Alternative 6 (Modified Cloverleaf Interchange)

As shown in Tables 2.15.E and 2.15.F, Alternative 6 would not result in permanent impacts to potential USACE or CDFW jurisdiction, which is the smallest impact of all the Build Alternatives. Impacts to potential RWQCB jurisdiction would be the same as impacts to potential USACE jurisdiction; therefore, Alternative 6 would not result in permanent impacts to RWQCB jurisdiction.

Potential permanent indirect impacts to jurisdictional areas are the same as Alternative 3 and would be avoided or minimized through implementation of Measures WQ-2 and INV-1.

Modified Alternative 7 (Modified Cloverleaf/Diamond Interchange) (Preferred Alternative)

As shown in Tables 2.15.E and 2.15.F, Modified Alternative 7 would result in permanent impacts to 0.01 ac of potential USACE nonwetland areas and 0.08 ac of potential CDFW jurisdiction. Impacts to RWQCB jurisdiction would be the same as impacts to USACE jurisdiction. Permanent impacts are depicted on Figure 2.15.3.

For Modified Alternative 7, impacts to Drainage C would occur from the replacement of the concrete ditch adjacent to the existing northbound off-ramp with an underground pipe. Impacts to Drainage E would occur from the replacement of a

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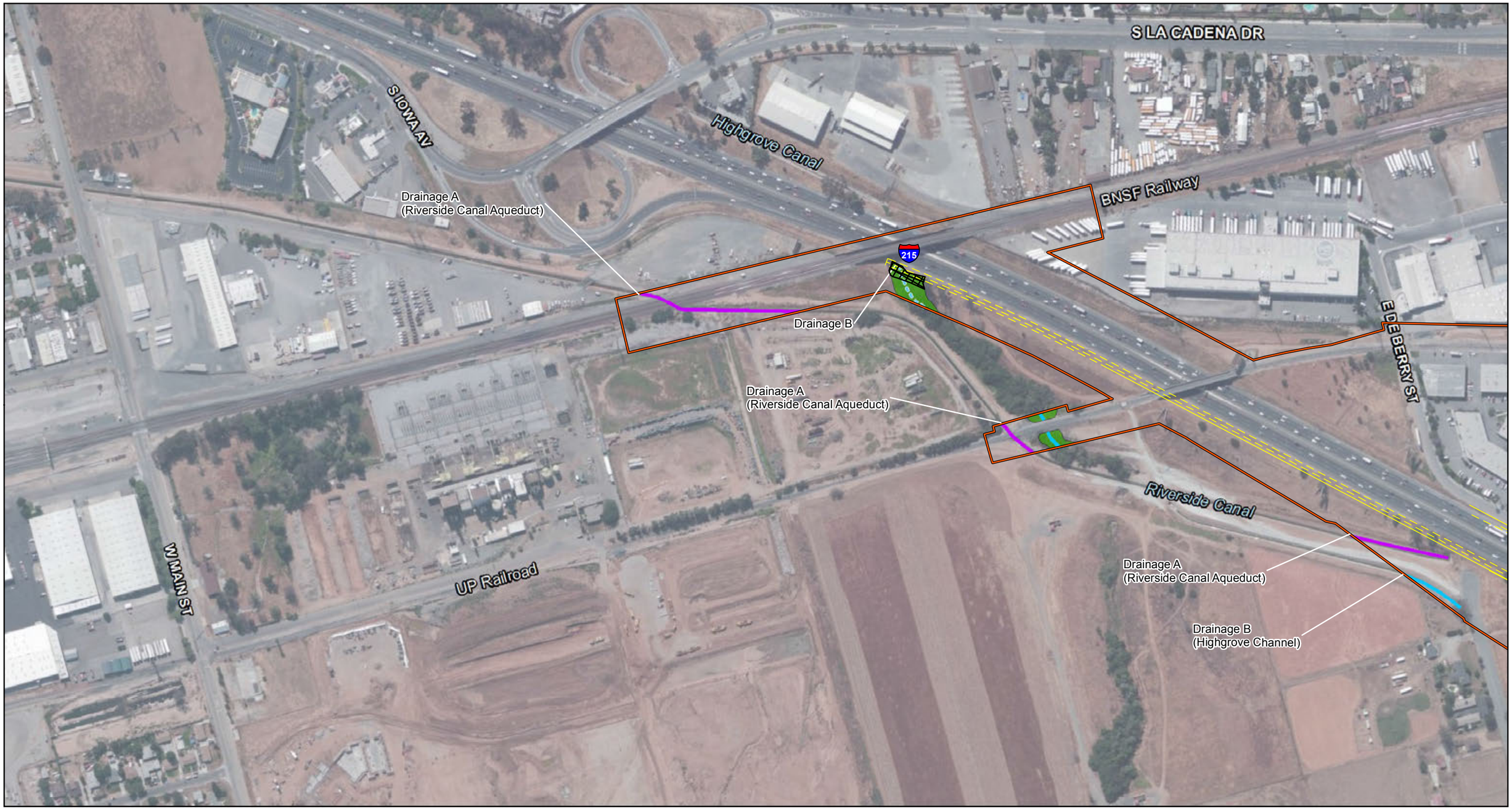


LEGEND

- Jurisdictional Study Area
- Modified Alternative 7 Layout
- Permanent Impacts to Potential Jurisdictional Areas
- Temporary Impacts to Potential Jurisdictional Areas
- I-215 Bi-County HOV Lane Gap Closure Project Impact Area
- CDFW Potential Jurisdictional Waters

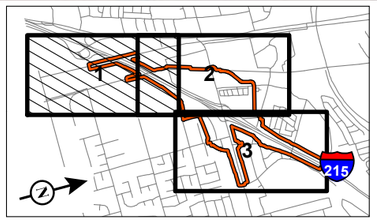
USACE Potential Jurisdiction

- Wetland Waters
- Non-Wetland Waters

Non-Jurisdictional

- Non-Jurisdictional Waters

0 150 300
FEET



SOURCE: Microsoft (5/2010); AECOM (8/2013)

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FIGURE 2.15.3
Sheet 1 of 3

I-215/Barton Road Interchange Improvement Project

Potential Jurisdictional Impacts - Modified Alternative 7 (Preferred Alternative)

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LEGEND

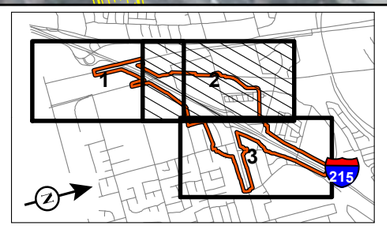
- Jurisdictional Study Area
- Modified Alternative 7 Layout
- Permanent Impacts to Potential Jurisdictional Areas
- Temporary Impacts to Potential Jurisdictional Areas
- I-215 Bi-County HOV Lane Gap Closure Project Impact Area
- CDFW Potential Jurisdictional Waters

USACE Potential Jurisdiction

- Wetland Waters
- Non-Wetland Waters

Non-Jurisdictional

- Non-Jurisdictional Waters



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SOURCE: Microsoft (5/2010); AECOM (8/2013)

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FIGURE 2.15.3
Sheet 2 of 3

I-215/Barton Road Interchange Improvement Project

Potential Jurisdictional Impacts - Modified Alternative 7 (Preferred Alternative)

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LEGEND

- Jurisdictional Study Area
- Modified Alternative 7 Layout
- Permanent Impacts to Potential Jurisdictional Areas
- Temporary Impacts to Potential Jurisdictional Areas
- I-215 Bi-County HOV Lane Gap Closure Project Impact Area
- CDFW Potential Jurisdictional Waters

USACE Potential Jurisdiction

- Wetland Waters
- Non-Wetland Waters

Non-Jurisdictional

- Non-Jurisdictional Waters

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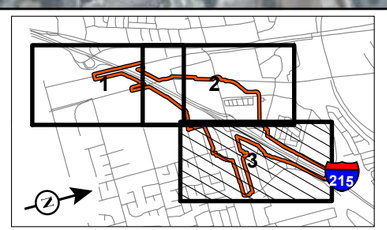

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FIGURE 2.15.3
Sheet 3 of 3

I-215/Barton Road Interchange Improvement Project

Potential Jurisdictional Impacts - Modified Alternative 7 (Preferred Alternative)

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portion of the concrete ditch on the east side of I-215 at Newport Avenue with an underground pipe.

Like Alternative 3, impacts to the jurisdictional areas would require authorization from CDFW and RWQCB prior to construction as specified in Measures WET-1 and WET-2. No mitigation, other than obtaining permits, is required because the drainages are concrete lined and void of vegetation. Because Modified Alternative 7 would impact <0.1 ac of potential USACE jurisdictional waters, postconstruction notification for compliance with the Nationwide Permit Program would be provided to the USACE as specified in Measure WET-3. With implementation of Measures WET-1 through WET-3, permanent impacts to potential jurisdictional areas would not be substantial.

Potential permanent indirect impacts to jurisdictional areas are the same as Alternatives 3 and 6 and would be avoided or minimized through implementation of Measures WQ-2 and INV-1.

Compensatory mitigation is not anticipated. With implementation of Measures WET-1 through WET-3, permanent impacts to jurisdictional areas would not be substantial.

Potential indirect impacts to jurisdictional areas include impacts to water quality caused by litter or pollutants in operational storm water runoff and the indirect effect of germination and proliferation of nonnative invasive plant species. Storm water and litter indirect impacts would be avoided through compliance with the California Department of Transportation (Caltrans) Storm Water Management Plan (SWMP) and the Caltrans and City National Pollutant Discharge Elimination System (NPDES) permits and implementation of Project-specific BMPs as required in Measure WQ-2 (Section 2.8). Control of invasive plant species requires revegetation with plant species native to the area, adherence to a weed abatement and control program, and compliance with pollution and litter laws and regulations as specified in Measure INV-1 (Section 2.19). Implementation of these measures would avoid or minimize permanent indirect impacts to jurisdictional areas, and no substantial impacts would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative) Impacts to Functions and Values

The temporary and permanent impacts to drainages described above have the potential to impact the functions and values discussed in Section 2.15.2.4. Drainages B and F are the only earthen channels and have low-to-moderate functions

and values for sediment stabilization, sediment/toxicant retention, nutrient removal/transformation, and wildlife habitat and moderate-to-high functions for flood flow alteration, as discussed in Section 2.15.2.4. As discussed above, none of the Build Alternatives would result in temporary or permanent impacts to Drainages B and F; therefore, the Build Alternatives are not expected to impact the functions or values of these drainages.

Alternative 3 and Modified Alternative 7 would result in permanent impacts to Drainage C. In addition, Modified Alternative 7 would result in temporary and permanent impacts to Drainage E. These drainages are concrete-lined channels, which all have low functions and values (for flood flow alteration, sediment/toxicant retention, and nutrient removal/transformation) and no to low functions for the following: groundwater discharge/recharge, sediment stabilization, wildlife habitat, uniqueness/heritage, and recreation. The impacts on the functions and values of the drainages are expected to be minimal due to the minimal activity that would occur within these waterways and because there are little to no functions and values of the concrete-lined drainages.

2.15.4 Avoidance, Minimization, and/or Mitigation Measures

Appropriate BMPs and conditions will be discussed and agreed upon with the resource agencies via the permit processes specified in WET-1, WET-2, and WET-3, listed below.

Potential temporary and permanent indirect impacts to jurisdictional areas would be avoided or minimized through implementation of Measures WQ-1, WQ-2, and INV-1.

WET-1 **Streambed Alteration Agreement.** Prior to construction, a Section 1602 Streambed Alteration Agreement will be obtained from the California Department of Fish and Wildlife (CDFW).

WET-2 **Water Quality Certification.** Prior to construction, a certification of water quality from the Santa Ana Regional Water Quality Control Board (RWQCB) Region 8, pursuant to Section 401 of the federal Clean Water Act (CWA), will be obtained.

WET-3 **Compliance with the Nationwide Permit Program.** During construction, the Project will comply with the Nationwide Permit Program, pursuant to Section 404 of the federal CWA.

2.16 Plant Species

2.16.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species, Section 2.19, in this document for detailed information about these species.

This section of the document discusses all the other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at United States Code 16 (USC), Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. California Department of Transportation (Caltrans) projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Section 1900–1913, and the California Environmental Quality Act (CEQA), CA Public Resources Code, Sections 2100–21177.

2.16.2 Affected Environment

This section is based on the *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013) prepared for the Project.

A literature review and records search were conducted to identify the existence or potential occurrence of sensitive or special-interest plant species in or within the vicinity of the Biological Study Area (BSA). The results of the literature review indicated the potential occurrence of 24 special-status plant species known from the vicinity of the BSA. A total of 6 of the 24 special-status plant species are federally and/or State-listed endangered or threatened species and are discussed later in Section 2.18, Threatened and Endangered Species. The remaining 18 special-status plant species identified as potentially occurring in the vicinity of the BSA are:

- Chaparral sand-verbena (*Abronia villosa* var. *aurita*)
- Horn's milk-vetch (*Astragalus hornii* var. *hornii*)
- Bristly sedge (*Carex comosa*)
- Smooth tarplant (*Centromadia pungens* ssp. *laevis*)
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*)
- Peruvian dodder (*Cuscuta obtusifolia* var. *glandulosa*)
- Alvin meadow bedstraw (*Galium californicum* ssp. *primum*)
- Los Angeles sunflower (*Helianthus nuttallii* ssp. *parishii*)
- Mesa horkelia (*Horkelia cuneata* ssp. *puberula*)
- Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)
- Parish's desert thorn (*Lycium parishii*)
- Pringle's monardella (*Monardella pringlei*)
- Parish's gooseberry (*Ribes divericatum* var. *parishii*)
- Brand's phacelia (*Phacelia stellaris;* federal candidate)
- Parish's checkerbloom (*Sidalcea hickmanii* ssp. *parishii*)
- Salt Spring checkerbloom (*Sidalcea neomexicana*)
- Prairie wedge grass (*Sphenopholis obtusata*)
- San Bernardino aster (*Symphyotrichum defoliatum* [*Aster defoliatus*])

In addition to the literature review, reconnaissance-level surveys were conducted on June 20 and November 12, 2008, to characterize the general biological resources and to ascertain the presence or absence of special-status plant species and the likelihood of their occurrence in the BSA. An additional survey was conducted on August 6, 2009, to assess additional Project impact areas resulting from engineering revisions. In addition, reconnaissance surveys were conducted on June 29, 2010, and March 13, 2013, to update existing conditions. No special-status plant species were observed or otherwise detected in the BSA at the time of the site visits.

There is marginal habitat for the nonlisted San Bernardino aster, Salt Spring checkerbloom, and prairie wedge grass, in the riparian habitat (Drainages B and F) in the BSA. The drainages where these species of special concern would be found are highly disturbed, constrained by development, and consist primarily of nonnative species or species commonly found in developed and disturbed areas. Further, these species were not observed during site visits. The remaining 15 special-status plant species are considered absent from the BSA because suitable habitat for these species is not located within the BSA.

2.16.3 Environmental Consequences

2.16.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no temporary impacts to plant species would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

There is a low potential for construction of the Project to affect the San Bernardino aster, Salt Spring checkerbloom, or prairie wedge grass. The drainages where the Salt Spring checkerbloom, prairie wedge grass, and San Bernardino aster would be found are highly disturbed and constrained by development and consist primarily of nonnative species or species commonly found in developed and disturbed areas. Further, the Build Alternatives would not directly affect any riparian habitat and, therefore, would not affect these riparian species. In addition, these nonlisted species were not observed during site visits. Any potential temporary impacts to these species would not be considered substantial because these species are relatively widespread in distribution, are afforded no legal or regulatory protection, and are not State or federally listed as threatened or endangered. Because no other special-status plant species were observed during the reconnaissance-level surveys or are expected to occur in the Project area, no substantial temporary impacts to special-status plant species are expected as a result of the Project.

2.16.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to plant species would occur.

Separately, the Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. Because no special-status plant species were observed or otherwise detected in the BSA, it is not expected that the I-215 Bi-County HOV Lane Gap Closure Project will permanently impact special-status plant species, including San Bernardino aster in the Project area.

Alternatives 3, 6, and Modified Alternative 7 (PreferredAlternative)

There is a low potential for the Project to affect the San Bernardino aster. The drainages where the Salt Spring checkerbloom, prairie wedge grass, and San Bernardino aster would be found are highly disturbed and constrained by development and consist primarily of nonnative species or species commonly found in developed and disturbed areas. Further, the Build Alternatives would not directly affect any riparian habitat and, therefore, would not affect these riparian species. In addition, these nonlisted species were not observed during site visits. Any potential permanent impacts to San Bernardino aster, Salt Spring checkerbloom, or prairie wedge grass would not be considered substantial because these species are relatively widespread in distribution, are afforded no legal or regulatory protection, and are not State or federally listed as threatened or endangered. Since all other special-status plant species are considered absent from the BSA, no other permanent impacts to special-status plant species are expected as a result of the Project.

2.16.4 Avoidance, Minimization, and/or Mitigation Measures

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

2.17 Animal Species

2.17.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.18 below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

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

State laws and regulations relevant to wildlife include the following:

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

2.17.2 Affected Environment

This section is based on the *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013) prepared for the Project and a USFWS updated list of proposed, threatened, or endangered species potentially occurring in the Project vicinity (April 18, 2013).

A literature review and records search were conducted to identify the existence or potential occurrence of sensitive or special-interest animal species in or within the vicinity of the Biological Study Area (BSA), including the updated USFWS species list. The results of the literature review indicated the potential occurrence of 21 special-status animal species known from the vicinity of the BSA. A total of 7 of the 21 special-status animal species are federally and/or State-listed endangered or

threatened species and are discussed in Section 2.18, Threatened and Endangered Species. The remaining 14 special-status animal species identified as potentially occurring in the BSA are:

- Arroyo chub (*Gila orcuttii*)
- Orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*)
- Red diamond rattlesnake (*Crotalus ruber*)
- Coast horned lizard (*Phrynosoma blainvillii* [*coronatum*])
- Western burrowing owl (burrow sites) (*Athene cunicularia*)
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis* [nesting])
- Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)
- Western mastiff bat (*Eumops perotis*)
- Western yellow bat (*Lasiurus xanthinus*)
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
- Pocketed free-tailed bat (*Nyctinomops femorasacca*)
- Southern grasshopper mouse (*Onychomys torridus ramona*)
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*)
- American badger (*Taxidea taxus*)

In addition to the literature review, reconnaissance-level surveys were conducted on June 20 and November 12, 2008, to characterize the general biological resources and to ascertain the presence or absence of special-status animal species and the likelihood of their occurrence in the BSA. An additional survey was conducted on August 6, 2009, to assess additional Project impact areas resulting from engineering revisions. Reconnaissance surveys were conducted on June 29, 2010, and March 13, 2013, to update existing conditions.

No special-status animal species were observed or otherwise detected in the BSA at the time of the site visit. With the exception of the northwestern San Diego pocket mouse, western burrowing owl, and western yellow bat, the special-status animal species listed above are considered absent from the BSA because suitable habitat for these species is not located within the BSA. Potentially suitable habitat for the northwestern San Diego pocket mouse, western yellow bat, and western burrowing owl is present in the BSA, as discussed in further detail below.

However, during field surveys of the vacant field east of Interstate 215 (I-215) south of Barton Road for northwestern San Diego pocket mouse, a nonlisted species of special concern, no habitat for this species was found. This field has been leveled to

bare dirt and is currently being used for equipment storage for the I-215 Bi-County HOV Lane Gap Closure Project. Any impact to this field due to the selected alternative would have no impact because it has been impacted by the I-215 Bi-County HOV Lane Gap Closure Project.

Two drainages (Drainages B and F) contain riparian habitat that could support special-status species associated with riparian areas. The western yellow bat has a potential to occur within riparian trees that are within the BSA.

A habitat suitability assessment was conducted for the western burrowing owl. Where potentially suitable habitat existed for the burrowing owl, a burrow survey was conducted. All burrows observed on site were assessed for indication of burrowing owl presence, activity, or sign. The burrowing owl habitat suitability assessment and burrow surveys for the burrowing owl were conducted on June 20, November 12, 2008; August 6, 2009; June 29, 2010; June 13 and 14, 2011; and March 13, 2013. There is marginal habitat for the western burrowing owl in the vacant field east of I-215 and south of Barton Road. The western burrowing owl was determined to be absent based on results of the burrow surveys. No evidence of potential burrowing owl burrows was observed during the burrow surveys. In addition, the vacant field is currently being used for construction equipment staging for the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project and has been highly disturbed. However, the burrowing owl is a mobile species and may colonize potentially suitable ruderal fields within the BSA prior to the start of construction.

2.17.3 Environmental Consequences

2.17.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no temporary impacts to animal species would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

There is no potential for construction of any of the Build Alternatives to affect the San Diego pocket mouse because there is no habitat present due to construction activities associated with the I-215 Bi-County HOV Lane Gap Closure Project.

There is a low potential for construction of any of the Build Alternatives to affect the western yellow bat. The drainages where the western yellow bat would be found is also highly disturbed and constrained by development and consists primarily of

nonnative species or species commonly found in developed and disturbed areas. Further, the Build Alternatives would not directly affect any riparian habitat and, therefore, would not affect this riparian species. In addition, the western yellow bat was not observed during site visits. Any potential temporary impacts to western yellow bat would not be considered substantial because this species is relatively widespread in distribution, is afforded no legal or regulatory protection, and is not State or federally listed as threatened or endangered. Because no other special-status animal species were observed during the reconnaissance-level surveys or are expected to occur in the Project area, no substantial temporary impacts to special-status animal species are expected.

Vegetation clearing and grading associated with the Project has the potential to disturb vegetation that may provide nesting habitat for migratory birds. Compliance with the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code, as specified in Measure AS-1, would be required to avoid potential impacts to migratory birds during construction.

The western burrowing owl was determined to be absent from the BSA. Therefore, construction of the Project is not expected to result in temporary impacts to burrowing owls. However, the burrowing owl is a mobile species and may colonize potentially suitable ruderal fields within the BSA prior to the start of construction. As specified in Measure AS-2, preconstruction surveys would be required prior to construction to ensure that burrowing owls are not occupying potentially suitable ruderal fields. If burrowing owls are present outside the nesting season, they will be relocated. If burrowing owls are present during the nesting season, construction activities within a 300 feet (ft) buffer of the occupied burrow will be prohibited. No substantial impacts would occur.

2.17.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to animal species would occur.

Separately, the I-215 Bi-County HOV Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. The I-215 Bi-County HOV Lane Gap

Closure Project includes measures to avoid, minimize, or mitigate impacts to special-status animal species. No substantial impacts will occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

There is a low potential for construction of the Project to affect the San Diego pocket mouse and western yellow bat. There is a low likelihood that the San Diego pocket mouse would be affected because the field where the San Diego pocket mouse would be found is highly disturbed by regular disking and does not consist of native vegetation. In addition, this field is being used for construction equipment staging for the I-215 Bi-County HOV Lane Gap Closure Project. The drainages where the western yellow bat would be found is also highly disturbed and constrained by development and consists primarily of nonnative species or species commonly found in developed and disturbed areas. Further, the Build Alternatives would not directly affect any riparian habitat and, therefore, would not affect this riparian species. In addition, the San Diego pocket mouse and western yellow bat were not observed during site visits. Any potential permanent impacts to San Diego pocket mouse and western yellow bat would not be considered substantial because these species are relatively widespread in distribution, are afforded no legal or regulatory protection, and are not State or federally listed as threatened or endangered.

Implementation of the Build Alternatives would result in the loss of a minor number of nonnative trees and shrubs. However, to the maximum extent feasible, trees and shrubs will be provided in available spaces. Permanent impacts to migratory birds are not considered substantial because of the small area of impact.

The western burrowing owl was determined to be absent from the BSA. Therefore, construction of the Project is not expected to result in permanent impacts to burrowing owls. However, the burrowing owl is a mobile species and may colonize potentially suitable ruderal fields within the BSA prior to the start of construction. As specified in Measure AS-2, preconstruction surveys would be required prior to construction to ensure that burrowing owls are not occupying potentially suitable ruderal fields. If burrowing owls are present outside the nesting season, they will be relocated. Therefore, construction of the Project would not result in the loss of individual burrowing owls. The Project would result in a minor loss of potentially suitable ruderal fields. However, permanent impacts to potential burrowing owl habitat are not considered substantial because of the small area of impact to marginal habitat.

Since all other special-status plant species are considered absent from the BSA, no other permanent impacts to special-status plant species are expected.

2.17.4 Avoidance, Minimization, and/or Mitigation Measures

The following measures are required to avoid and/or minimize impacts to western burrowing owl and migratory birds during construction of Alternatives 3, 6, or Modified Alternative 7.

AS-1 **Migratory Bird Treaty Act.** In compliance with the Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code, during construction, the construction contractor will restrict vegetation clearing to outside the active breeding season (February 15–August 31) for birds. If vegetation clearing is scheduled during the breeding season, a qualified biologist will conduct clearance surveys for active bird nesting immediately prior to any clearing of vegetation. During the clearance surveys, the location of any active bird nests will be mapped by the biologist, and an appropriate buffer (e.g., 250-foot [ft] buffer for raptors) where work will not take place will be established and monitored. The buffer will be delineated by roping or flagging the boundaries and will remain in place until the nest is either abandoned or the young have fledged.

AS-2 **Burrowing Owl Survey Protocol.** Consistent with the *California Department of Fish and Wildlife (CDFW) Burrowing Owl Survey Protocol and Mitigation Guidelines* (prepared by the California Burrowing Owl Consortium, April 1993), a preconstruction survey will be conducted by a qualified biologist within 30 days prior to Project-related ground-disturbing activities to ensure that burrowing owls are not occupying potentially suitable ruderal fields. If owls are determined to be present outside the nesting season (February 15–August 31), coordination with the CDFW will occur to passively relocate the burrowing owls. If nesting burrowing owls are determined to be present during the nesting season, construction activities within a 300 ft buffer of the occupied burrow will be prohibited until the end of nesting season or until it is determined that the owls are not utilizing the burrow as a nest.

2.18 Threatened and Endangered Species

2.18.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA), are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a No Effect finding. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the

coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

2.18.2 Affected Environment

This section is based on the *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013) prepared for the Project and a USFWS updated list of proposed, threatened, or endangered species list potentially occurring in the Project vicinity (April 18, 2013).

A literature review and records search were conducted to identify the existence or potential occurrence of threatened or endangered species in or within the vicinity of the Biological Study Area (BSA). Threatened or endangered plant species identified as potentially occurring in the vicinity of the BSA are:

- Marsh sandwort (*Arenaria paludicola;* federally endangered/State endangered)
- Nevin's barberry (*Berberis nevinii;* federally endangered/State endangered)
- Salt marsh bird's beak (*Cordylanthus maritimus* spp. *maritimus;* federally endangered/State endangered)
- Slender-horned spineflower (*Dodecahema leptoceras;* federally endangered/State endangered)
- Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum;* federally endangered/State endangered)
- Gambel's water cress (*Nasturtium gambelii;* federally endangered/State endangered)

The threatened or endangered animal species identified as potentially occurring in the BSA are:

- Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis;* federally endangered)
- Santa Ana sucker (*Catostomus santaanae;* federally threatened)
- Southwestern willow flycatcher (*Empidonax traillii extimus;* federally endangered/State endangered)

- Coastal California gnatcatcher (*Polioptila californica californica;* federally threatened)
- Least Bell's vireo (*Vireo bellii pusillus*; federally endangered/State endangered)
- San Bernardino kangaroo rat (*Dipodomys merriami parvus;* federally endangered)
- Stephens' kangaroo rat (*Dipodomys stephensi;* federally endangered/State endangered)

In addition to the literature review, reconnaissance-level surveys were conducted on June 20 and November 12, 2008, to characterize the general biological resources and to ascertain the presence or absence of threatened or endangered animal species and the likelihood of their occurrence in the BSA. An additional survey was conducted on August 6, 2009, to assess additional Project impact areas resulting from engineering revisions. Reconnaissance surveys were conducted on June 29, 2010, and March 13, 2013, to update existing conditions.

Table 2.18.A provides a list of species observed during the field surveys. No threatened or endangered animal species were observed or otherwise detected in the BSA at the time of the site visit. Two drainages (Drainages B and F) contain riparian habitat that could support special-status species associated with riparian areas. However, the majority of the vegetation in Drainage F consists of nonnative species and does not include suitable breeding habitat for least Bell's vireo. Portions of Drainage B are also vegetated with riparian habitat; however, there is not a dense understory to support least Bell's vireo in this drainage. The BSA does not contain, nor is it adjacent to, suitable habitat for any other threatened or endangered species identified in the literature search. Therefore, the threatened and endangered species listed above are considered absent from the BSA because suitable habitat for these species is not located within the BSA, and these species were not detected during the surveys.

2.18.3 Environmental Consequences

2.18.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to threatened and endangered species would occur.

Table 2.18.A Plant and Animal Species Observed

Scientific Name	Common Name
PLANT SPECIES OBSERVED	
Aizoaceae	**Carpet weed family**
Conicosia pugioniformis (nonnative species)	Narrow-leaved iceplant, roundleaf iceplant
Trianthema portulacastrum	Horse-purslane
Amaranthaceae	**Amaranth family**
Amaranthus albus (nonnative species)	Tumbling pigweed
Asteraceae	**Sunflower family**
Ambrosia cf. confertiflora	Weak-leaved burweed
Conyza bonariensis (nonnative species)	Flax-leaved horseweed
Encelia farinosa	Brittlebush
Lactuca serriola (nonnative species)	Prickly lettuce
Sonchus oleraceus (nonnative species)	Common sow thistle
Ambrosia acanthicarpa	Annual bur-sage
Helianthus annuus	Common sunflower
Boraginaceae	**Borage family**
Heliotropium curassavicum	Salt heliotrope
Brassicaceae	**Mustard family**
Hirschfeldia incana (nonnative species)	Shortpod mustard
Sisymbrium irio (nonnative species)	London rocket
Raphanus sativus (nonnative species)	Wild radish
Caprifoliaceae	**Honeysuckle family**
Sambucus mexicana	Blue elderberry
Chenopodiaceae	**Saltbush family**
Salsola tragus (nonnative species)	Russian thistle
Convolvulaceae	**Morning-glory family**
Ipomoea sp. (nonnative species)	Morning glory
Euphorbiaceae	**Spurge family**
Croton setigerus	Dove weed
Chamaesyce albomarginata	Rattlesnake weed
Ricinus communis (nonnative species)	Castor bean
Juglandaceae	**Walnut family**
Juglans sp.	Walnut
Malvaceae	**Mallow family**
Malva parviflora (nonnative species)	Cheeseweed
Moraceae	**Mulberry family**
Ficus carica (nonnative species)	Edible fig
Myrtaceae	**Myrtle family**
Eucalyptus sp. (nonnative species)	Eucalyptus
Oleaceae	**Olive family**
Olea europaea (nonnative species)	European olive
Onagraceae	**Evening primrose family**
Epilobium ciliatum	Green willow herb
Rosaceae	**Rose family**
Prunus ilicifolia	Hollyleaf cherry
Salicaceae	**Willow family**
Salix gooddingii	Goodding's willow
Salix lasiolepis	Arroyo willow
Simaroubaceae	**Quassia family**
Ailanthus altissima (nonnative species)	Tree of heaven
Solanaceae	**Nightshade family**
Datura sp.	Datura
Ulmaceae	**Elm family**
Ulmus sp.	Elm
Arecaceae	**Palm family**
Washingtonia robusta (nonnative species)	Mexican fan palm

Table 2.18.A Plant and Animal Species Observed (continued)

Scientific Name	Common Name
Cyperaceae	**Sedge family**
Bolboschoenus glaucus	Bulrush
Poaceae	**Grass family**
Avena fatua (nonnative species)	Wild oat
Bromus catharticus (nonnative species)	Rescue grass
Hordeum murinum (nonnative species)	Foxtail barley
Paspalum dilatatum (nonnative species)	Dallis grass
Agrostis viridis (nonnative species)	Water bentgrass
Bromus diandrus (nonnative species)	Ripgut brome
Cynodon dactylon (nonnative species)	Bermuda grass
Leptochloa uninervia	Mexican sprangletop
Pennisetum cf. clandestinum (nonnative species)	Kikuyugrass
Polypogon sp.	
Typhaceae	**Cattail family**
Typha angustifolia	Narrow-leaved cattail
ANIMAL SPECIES OBSERVED	
AVES	**BIRDS**
Charadriidae	**Plovers and Lapwings**
Charadrius vociferus	Killdeer
Columbidae	**Pigeons and Doves**
Zenaida macroura	Mourning dove
Corvidae	**Crows and Ravens**
Corvus brachyrhynchos	American crow
Hirundinidae	**Swallows**
Stelgidopteryx serripennis	Northern rough-winged swallow
Fringillidae	**Finches**
Carpodacus mexicanus	House finch

Source: *Natural Environment Study (Minimal Impacts) (NES[MI])* (October 2013).

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

No threatened or endangered species or their habitats are present within the BSA; therefore, no temporary impacts to threatened or endangered species would occur during construction of the Project.

2.18.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to threatened and endangered species would occur.

Separately, the Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. No threatened or endangered species or their habitats are present within the

BSA; therefore, no permanent impacts to threatened or endangered species will occur as a result of the I-215 Bi-County HOV Lane Gap Closure Project.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

No threatened or endangered species or their habitats are present within the BSA; therefore, no permanent impacts to threatened or endangered species would occur as a result of the Project.

2.18.4 Avoidance, Minimization, and/or Mitigation Measures

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

2.19 Invasive Species

2.19.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State's invasive species list currently maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

2.19.2 Affected Environment

This section is based on the *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013) prepared for the Project.

The California Invasive Plant Council (Cal-IPC) 2006 Invasive Plant Inventory (including the 2007 update) is based on information submitted by members, land managers, botanists, and researchers throughout the State as well as published sources. The inventory highlights nonnative plants that are serious problems in wildlands (natural areas that support native ecosystems, including national, State, and local parks; ecological reserves; wildlife areas; National Forests; Bureau of Land Management lands; etc.). The inventory categorizes plants as High, Moderate, or Limited based on the species' negative ecological impact in California. Plants categorized as High have severe ecological impacts. Plants categorized as Moderate have substantial and apparent, but not severe, ecological impacts. Plants categorized as Limited are invasive, but their ecological impacts are minor on a statewide level.

As shown in Table 2.19.A, a total of 16 nonnative plant species occurring on the Cal-IPC California Invasive Plant Inventory were identified in the Biological Study Area (BSA). Of these species, there are 10 with a moderate rating, and 6 with a limited rating.

Table 2.19.A Invasive Plant Species in the Biological Study Area

Scientific Name	Common Name	Rating
Aizoaceae	**Carpet weed family**	
Conicosia pugioniformis	Narrow-leaved iceplant, roundleaf iceplant	Limited
Brassicaceae	**Mustard family**	
Hirschfeldia incana	Shortpod mustard	Moderate
Sisymbrium irio	London rocket	Moderate
Raphanus sativus	Wild radish	Limited
Euphorbiaceae	**Spurge family**	
Ricinus communis	Castor bean	Limited
Moraceae	**Mulberry family**	
Ficus carica	Edible fig	Moderate
Myrtaceae	**Myrtle family**	
Eucalyptus sp.	Eucalyptus	Moderate
Oleaceae	**Olive family**	
Olea europaea	European olive	Limited
Simaroubaceae	**Quassia family**	
Ailanthus altissima	Tree of heaven	Moderate
Arecaceae	**Palm family**	
Washingtonia robusta	Mexican fan palm	Moderate
Poaceae	**Grass family**	
Avena fatua	Wild oat	Moderate
Hordeum murinum	Foxtail barley	Moderate
Bromus diandrus	Ripgut brome	Moderate
Cynodon dactylon	Bermuda grass	Moderate
Pennisetum cf. *clandestinum*	Kikuyugrass	Limited
Polypogon sp.		Limited

Sources: *Natural Environment Study (Minimal Impacts)* (NES[MI]) (October 2013) and the California Invasive Plant Council (Cal-IPC) 2006 *Invasive Plant Inventory*.

2.19.3 Environmental Consequences

2.19.3.1 Temporary Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no temporary impacts to invasive species would occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Impacts related to invasive species are considered permanent impacts because the introduction of invasive species into previously undisturbed areas would result in permanent impacts to the habitat. Therefore, impacts related to invasive species as a result of construction of the Project are described below under permanent impacts.

2.19.3.2 Permanent Impacts

Alternative 1 (No Build Alternative)

The No Build Alternative does not include any improvements to the interchange or local roads in the Project area; therefore, no permanent impacts to invasive species would occur.

Separately, the Interstate 215 (I-215) Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, discussed in Chapter 1.0, Section 1.1.2, will convert a portion of freeway-adjacent properties to transportation land uses within the Project area. Implementation of the I-215 Bi-County HOV Lane Gap Closure Project will comply with EO 13112, and no substantial impacts related to invasive species will occur.

Alternatives 3, 6, and Modified Alternative 7 (Preferred Alternative)

Construction of the Project has the potential to spread invasive species by the entering and exiting of construction equipment contaminated by invasive species, disturbances to soil surfaces, and improper removal and disposal of invasive species that result in the seed being spread along the highway. Invasive species also have the potential to be included in seed mixtures and mulch; however, none of the species on the California list of noxious weeds are currently used by the California Department of Transportation (Caltrans) for erosion control or landscaping. With implementation of Measure INV-1, potential Project-related permanent impacts related to invasive species would not be substantial.

2.19.4 Avoidance, Minimization, and/or Mitigation Measures

The following measure is required for Alternatives 3, 6, and Modified Alternative 7 to avoid Project impacts related to invasive species:

INV-1 **Executive Order 13112.** In compliance with Executive Order (EO) 13112, a weed abatement program will be developed to minimize the importation of nonnative plant material during and after construction. Eradication strategies will be employed should an invasion occur. At a minimum, this program will include:

a. During construction, the construction contractor will inspect and clean construction equipment at the beginning and end of each day and prior to transporting equipment from one project location to another.

b. During construction, soil and vegetation disturbance will be minimized to the greatest extent feasible.
c. During construction, the construction contractor will ensure that all active portions of the construction site are watered as needed due to dry or windy conditions to prevent excessive amounts of dust.
d. During construction, the construction contractor will ensure that all material stockpiled is sufficiently watered or covered to prevent excessive amounts of dust.
e. During construction, soil/gravel/rock will be obtained from weed-free sources.
f. Only certified weed-free straw, mulch, and/or fiber rolls will be used for erosion control.
g. After construction, affected areas adjacent to native vegetation will be revegetated with plant species native to the vicinity and approved by the California Department of Transportation (Caltrans) District Biologist.
h. After construction, all revegetated areas will avoid the use of species listed in California Invasive Plant Council's (Cal-IPC's) California Invasive Plant Inventory.
i. After construction, erosion control and revegetation sites will be monitored for 2 to 3 years after construction to detect nonnative species prior to the establishment of the native vegetation.
j. Eradication procedures (e.g., spraying and/or hand weeding) will be outlined should an infestation occur; the use of herbicides will be prohibited within and adjacent to native vegetation, except as specifically authorized and monitored by the District Biologist.

2.20 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases (GHGs), particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization's in 1988, has led to increased efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs related to human activity that include carbon dioxide (CO2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

There are typically two terms used when discussing the impacts of climate change. "Greenhouse Gas (GHG) Mitigation" is a term for reducing GHG emissions in order to reduce or "mitigate" the impacts of climate change. "Adaptation," refers to the effort of planning for and adapting to impacts due to climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels)[1].

Transportation sources (passenger cars, light duty trucks, other trucks, buses and motorcycles) in the state of California make up the largest source (second to electricity generation) of greenhouse gas emitting sources. Conversely, the main source of GHG emissions in the United States (U.S.) is electricity generation followed by transportation. The dominant GHG emitted is CO2, mostly from fossil fuel combustion.

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

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

2.20.1 Regulatory Setting

State

With the passage of several pieces of legislation including State Senate and Assembly Bills and Executive Orders, California launched an innovative and pro-active approach to dealing with greenhouse gas emissions and climate change at the state level.

Assembly Bill 1493 (AB 1493), Pavley. Vehicular Emissions: Greenhouse Gases (GHGs) (AB 1493), 2002: requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year. In June 2009, the U.S. Environmental Protection Agency (U.S. EPA) Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own GHG emission standards for motor vehicles beginning with model year 2009. California agencies will be working with Federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger cars model years 2017–2025.

Executive Order (EO) S-3-05: (signed on June 1, 2005, by Governor Arnold Schwarzenegger) the goal of this EO is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

AB 32 (AB 32), the Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." EO S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the State's Climate Action Team.

EO S-01-07: Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least ten percent by 2020.

Senate Bill 97 (Chapter 185, 2007): required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. The Amendments became effective on March 18, 2010.

Federal

Although climate change and GHG reduction is a concern at the federal level; currently there are, no regulations or legislation that have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the U.S. EPA nor Federal Highway Administration (FHWA) has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

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

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and EO 13514- *Federal Leadership in Environmental, Energy and Economic Performance*.

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

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be

anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)--in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009[1]. On May 7, 2010 the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a memorandum on May 21, 2010.[2]

The final combined U.S. EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG) if the

1 http://www.epa.gov/climatechange/endangerment.html.

2 http://epa.gov/otaq/climate/regulations.htm.

automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards will cut GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016).

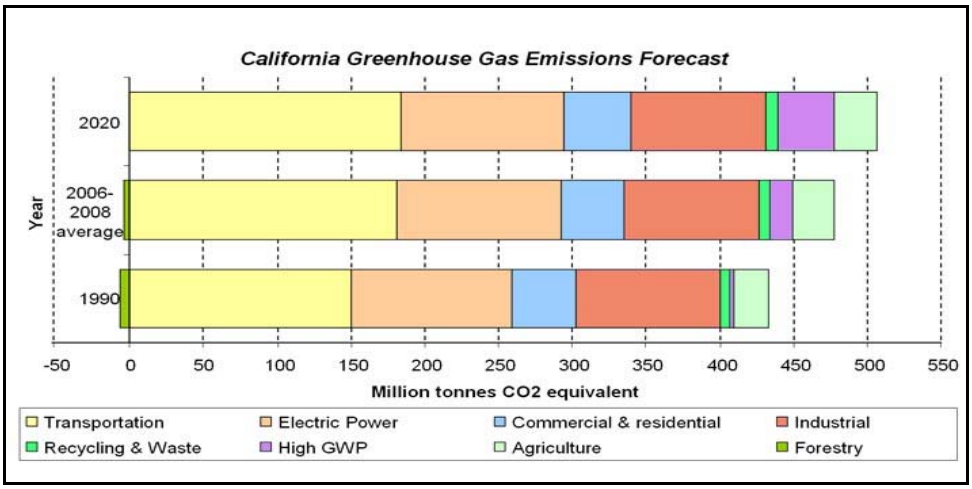
On January 24, 2011, the U.S. EPA along with the U.S. Department of Transportation and the State of California announced a single timeframe for proposing fuel economy and GHG standards for model years 2017-2025 cars and light-trucks. Proposing the new standards in the same timeframe (September 1, 2011)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

2.20.2 Project Analysis

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

The AB 32 Scoping Plan contains the main strategies California will use to reduce GHG. As part of its supporting documentation for the Draft Scoping Plan, ARB released the GHG inventory for California (Forecast last updated: 28 October 2010). The forecast is an estimate of the emissions expected to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

[1] This approach is supported by the AEP: Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), as well as the SCAQMD (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).



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

Figure 2.20.1 California Greenhouse Gas Forecast

Caltrans and its parent agency, the California State Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006 (see Climate Action Program at Caltrans [December 2006]).[1]

One of the main strategies in Caltrans Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour (see Figure 2.20.2 below). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO_2, may be reduced.

The purpose of the proposed project is to alleviate existing and future traffic congestion at the I-215/Barton Road interchange. The proposed project will not generate new vehicular traffic trips since new homes or businesses will not be constructed. However, there is a possibility that some traffic currently utilizing other

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

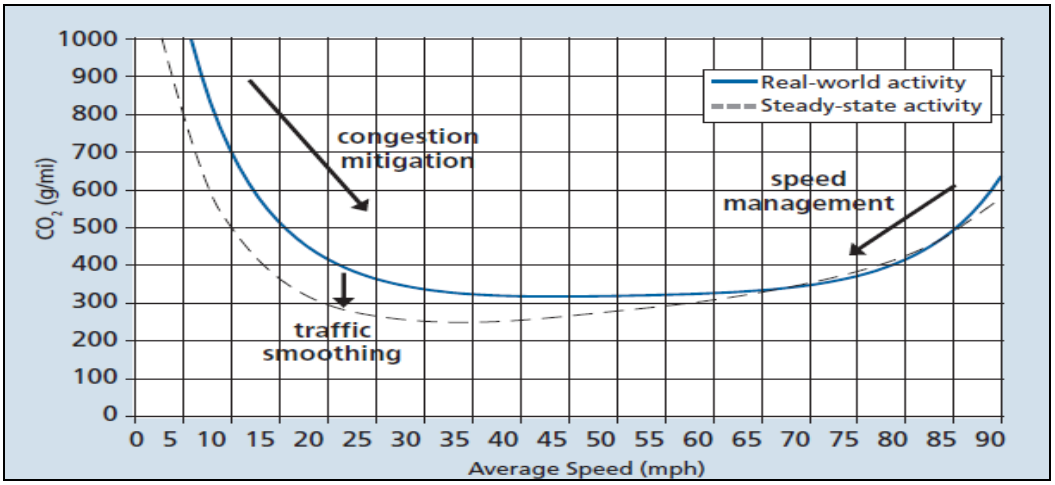


Figure 2.20.2 Possible Effect of Traffic Operation Strategies in Reducing On-Road CO_2 Emission[1]

routes would be attracted to use the new facility, thus resulting in slight increases in VMT. The impact of GHG emissions is a global rather than a local issue. However, due to lack of global models for project-level analyses, the impact of the Build Alternative on GHG emissions was calculated using traffic data for the project region.

The traffic study (December 2011) calculated the VMT and VHT for all of the vehicle trips within the project region (see Table 2.12J). This traffic data, in conjunction with the EMFAC2011 emission model, was used to calculate and compare the CO_2 emissions for the 2009 and 2040 regional conditions.

The results of the modeling were used to calculate the CO_2 emissions listed in Table 2.20.A. The CO_2 emissions numbers listed in Table 2.20.A are only useful for a comparison between project alternatives. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions will be because CO_2 emissions are dependent on other factors that are not part of the model, such as the fuel mix (EMFAC model emission rates are only for direct engine-out CO_2 emissions, not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components), rate of acceleration, and the aerodynamics and efficiency of the vehicles. As shown in Table 2.20.A, the

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

Table 2.20.A Change in Regional CO_2 Emissions (MT/year)

Alternative	Annual CO_2 Emissions (MT/year)	Increase from Existing (MT/year)	Increase from No Project (MT/year)	Percent Increase from No Project
2009 Existing[a]	1,156	-	-	-
2040 No Build[b]	1,549	393	-	-
2040 Alternative 3[b]	1,551	395	2.38	0.15%
2040 Alternative 6[b]	1,552	396	2.78	0.18%
2040 Alternative 7[b]	1,550	394	1.03	0.07%

Source: *Air Quality Analysis* (September 2013).
Mt/yr = metric tons per year
[a] 2009 Existing CO_2 emissions calculated using San Bernardino County specific average EMFAC2011 emission rates in 2009. Does not use Pavely and LCFS rates.
[b] 2040 CO_2 emissions calculated using San Bernardino County specific average EMFAC2011 emission rates in 2035. Uses Pavely and LCFS rates.

proposed project would result in a small increase (less than 1 percent) in CO_2 emissions within the region when compared to the without project conditions.

2.20.3 Construction Emissions

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. Daily and annual construction-related GHG emissions are presented in Table 2.20.B (model data is provided in Appendix D of the Air Quality Analysis). The emissions presented below are based on the best information available at the time of calculations in November 2013. The schedule for all improvements is anticipated to take approximately 24 months. The project schedule and disturbed area would be the same for all Build Alternatives; therefore, the emissions listed in Table 2.20.B would apply to Alternatives 3, 6, and Modified Alternative 7.

Table 2.20.B Maximum Project Construction Greenhouse Gas Emissions

Project Phases	CO_2
Grubbing/Land Clearing (lbs/day)	2,685.9
Grading/Excavation (lbs/day)	27,848.4
Drainage/Utilities/Sub-Grade (lbs/day)	10,965.1
Paving (lbs/day)	2,522.1
Maximum (lbs/day)	27,848.4
Total (MT/construction project)	**3,956.1**
Annual Total (MT/year)	**1,978.05**

Source: LSA Associates, Inc. (June 2013).

These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. As discussed below in Section 2.20.5, idling times would be restricted to 10 minutes in each direction for passenger cars during lane closures and 5 minutes for construction vehicles. Restricting idling times reduces harmful emissions from passenger cars and diesel-powered construction vehicles.

2.20.4 Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting CO_2 emissions. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008), studies have revealed that brief but rapid accelerations can contribute significantly to a vehicle's carbon monoxide and hydrocarbon emissions during a typical urban trip. Current emission-factor models are insensitive to the distribution of such modal events (i.e., cruise, acceleration, deceleration, and idle) in the operation of a vehicle and instead estimate emissions by average trip speed. This limitation creates an uncertainty in the model's results when compared to the estimated emissions of the various alternatives with baseline in an attempt to determine impacts. Although work by EPA and the CARB is underway on modal-emission models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling. In addition, EMFAC does not include speed corrections for most vehicle classes for CO_2 – for most vehicle classes emission factors are held constant which means that EMFAC is not sensitive to the decreased emissions associated with improved traffic flows for most vehicle classes. Therefore, unless a project involves a large number of heavy-duty vehicles, the difference in modeled CO_2 emissions due to speed change will be slight.

CARB is currently not using EMFAC to create its inventory of greenhouse gas emissions. It is unclear why the CARB has made this decision. Their website only states:

> REVISION: Both the EMFAC and OFFROAD Models develop CO_2 and CH_4 [methane] emission estimates; however, they are not currently used as the basis for [CARB's] official [greenhouse gas] inventory which is based on fuel usage information. . . However, ARB is working towards reconciling the emission estimates from the fuel usage approach and the models.

Other Variables

With the current science, project-level analysis of greenhouse gas emissions is limited. Although a greenhouse gas analysis is included for this project, there are numerous key greenhouse gas variables that are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2008 (http://www.epa.gov/oms/fetrends.htm)," which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy has improved each year beginning in 2005, and is now the highest since 1993. Most of the increase since 2004 is due to higher fuel economy for light trucks, following a long-term trend of slightly declining overall fuel economy that peaked in 1987. These vehicles also have a slightly lower market share, peaking at 52 percent in 2004 with projections at 48 percent in 2008. Table 2.20.C shows the alternatives for vehicle fuel economy increases studied by the National Highway Traffic Safety Administration in its Final EIS for New Corporate Average Fuel Economy (CAFE) Standards (October 2008).

Table 2.20.C Model Year 2015 Required Miles Per Gallon (mpg) by Alternative

No Action		25% Below Optimized	Optimized (Preferred)	25% Above Optimized	50% Above Optimized	Total Costs Equal Total Benefits	Technology Exhaustion
Cars	27.5	33.9	35.7	37.5	39.5	43.3	52.6
Trucks	23.5	27.5	28.6	29.8	30.9	33.1	34.7
Source: National Highway Traffic Safety Administration (2008)							

Second, near zero carbon vehicles will come into the market during the design life of this project. According to a March 2008 report released by University of California Davis (UC Davis), Institute of Transportation Studies:

> "Large advancements have occurred in fuel cell vehicle and hydrogen infrastructure technology over the past 15 years. Fuel cell technology has progressed substantially resulting in power density, efficiency, range, cost, and durability all improving each year. In another sign of progress, automotive developers are now demonstrating over 100 fuel cell vehicles (FCVs) in California – several in the hands of the general public – with configurations designed to be attractive to buyers. Cold-weather operation and vehicle range challenges are close to being solved, although vehicle cost and durability improvements are required before a commercial vehicle can be successful without incentives. The pace of development is on track to approach pre-commercialization within the next decade.
>
> "A number of the U.S. DOE 2010 milestones for FCV development and commercialization are expected to be met by 2010. Accounting for a five to six year production development cycle, the scenarios developed by the U.S. DOE suggest that 10,000s of vehicles per year from 2015 to 2017 would be possible in a federal demonstration program, assuming large cost share grants by the government and industry are available to reduce the cost of production vehicles."[1]

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

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

[1] Cunningham, Joshua, Sig Cronich, Michael A. Nicholas. March 2008. Why Hydrogen and Fuel Cells are Needed to Support California Climate Policy, UC Davis, Institute of Transportation Studies, pp. 9-10.

fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles.

2.20.5 Limitations and Uncertainties with Impact Assessment

Taken from p. 3-70 of the National Highway Traffic Safety Administration Final EIS for New CAFE Standards (October 2008), Figure 2.20.3 illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

"Cascade of uncertainties typical in impact assessments showing the "uncertainty explosion" as these ranges are multiplied to encompass a comprehensive range of future consequences, including physical, economic, social, and political impacts and policy responses."

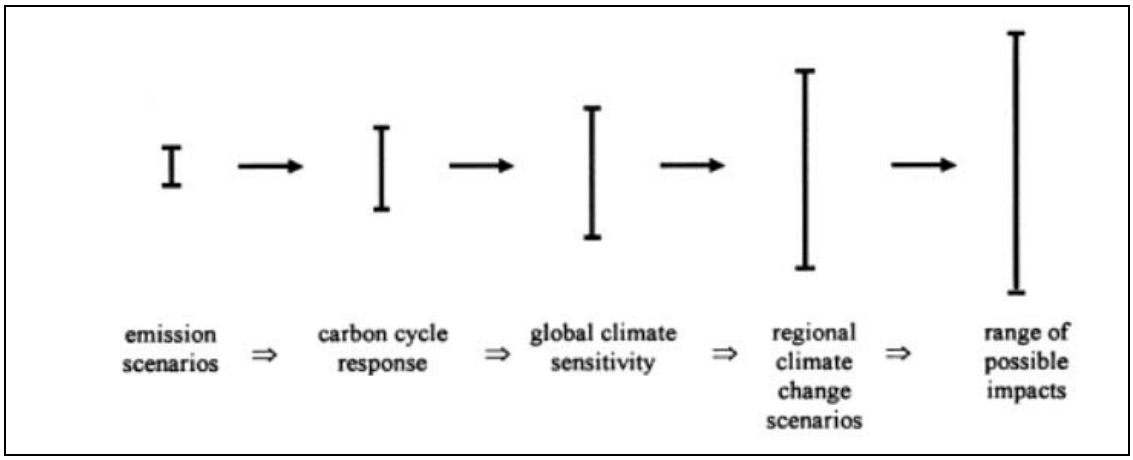


Figure 2.20.3 Cascade of Uncertainties

Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO_2 equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to

reduce greenhouse gas emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO2 from 2000 to 2030, which represents an increase of between 25 and 90%.[1]

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing "new" greenhouse gas emissions. It is difficult to assess the extent to which any project level increase in CO_2 emissions represents a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

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

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

[1] Intergovernmental Panel on Climate Change (IPCC). February 2007. Climate Change 2007: The Physical Science Basis: Summary for Policy Makers. http://www.ipcc.ch/SPM2feb07.pdf.

United States light vehicle fleet is expected to decline in the future, due primarily to rapid growth of emissions from developing economies (which are due in part to growth in global transportation sector emissions)." [NHTSA Draft EIS for New CAFE Standards, June 2008, pp.3-77 to 3-78]

2.20.6 CEQA Conclusion

As discussed above, both the future with project and future no build show increases in CO_2 emissions over the existing levels; the future build CO_2 emissions are higher than the future no build emissions. In addition, as discussed above, there are also limitations with EMFAC and with assessing what a given CO_2 emissions increase means for climate change. Therefore, it is Caltrans determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

2.20.7 Greenhouse Gas Reduction Strategies

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Former Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade. The Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together are expected to reduce congestion. The Strategic Growth Plan relies on a complete systems approach to attain CO2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as depicted in Figure 2.20.4, The Mobility Pyramid.

Figure 2.20.4 Mobility Pyramid

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by U.S. EPA and ARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the UC Davis.

The Department is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391(Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our

collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

Table 2.20.D summarizes Caltrans and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)[1] provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

The following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

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

1. Landscaping reduces surface warming, and through photosynthesis, decreases CO_2. Landscaping would be provided where necessary within the corridor to provide aesthetic treatment, replacement planting, or planting for purposes of minimizing impacts resulting from the project. The landscape planting would help offset any potential CO_2 emissions increase.
2. The project would incorporate the use of energy-efficient lighting, such as LED traffic signals, to the extent feasible. LED bulbs—or balls, in the stoplight vernacular—cost $60 to $70 apiece but last five to six years, compared to the

[1] http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

Table 2.20.D Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5% limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	3.6
Goods Movement	Office of Goods Movement	CalEPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					**2.66**	**18.67**

one-year average lifespan of the incandescent bulbs previously used. The LED balls themselves consume 10 percent of the electricity of traditional lights, which will also help reduce the project's CO_2 emissions.[1]

3. According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to ten minutes in each direction. In addition, the contractor must comply with Title 13, California Code of Regulations §2449(d)(3) was adopted by the ARB on June 15, 2008. This regulation restricts idling of construction vehicles to no longer than 5 consecutive minutes. Compliance with this regulation reduces harmful emissions from diesel-powered construction vehicles.

2.20.8 Adaptation Strategies

"Adaptation strategies" refer to how the Department and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[2], outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks.

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1 Knoxville Business Journal, "LED Lights Pay for Themselves," May 19, 2008 at http://www.knoxnews.com/news/2008/may/19/led-traffic-lights-pay-themselves/.

2 http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation

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

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop The California Climate Adaptation Strategy (Dec 2009)[1], which summarizes the best-known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report[2] to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

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1 http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF.

2 *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at http://www.nap.edu/catalog.php?record_id=13389.

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates;
- The range of uncertainty in selected sea level rise projections;
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data

All projects that have filed a Notice of Preparation as of the date of EO S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines.

The Interstate 215 / Barton Road interchange improvement project is currently not scheduled to begin construction until 2016, however, the Project location is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

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

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

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

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2.21 Cumulative Impacts

2.21.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

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

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

2.21.2 Methodology

The cumulative impact analysis methodology utilized was based upon the eight-step process set forth in the California Department of Transportation (Caltrans) Standard Environmental Reference (SER) Guidance for Preparers of Cumulative Impact Analysis (2005). The eight-step process is as follows:

- Identify resources to be analyzed
- Define the study area for each resource (i.e., Resource Study Area)
- Describe the current health and historical context for each resource
- Identify direct and indirect impacts of the proposed project

- Identify other reasonably foreseeable actions that affect each resource
- Assess potential cumulative impacts
- Report results
- Assess the need for mitigation

2.21.3 Resources Excluded from Cumulative Impacts Analysis

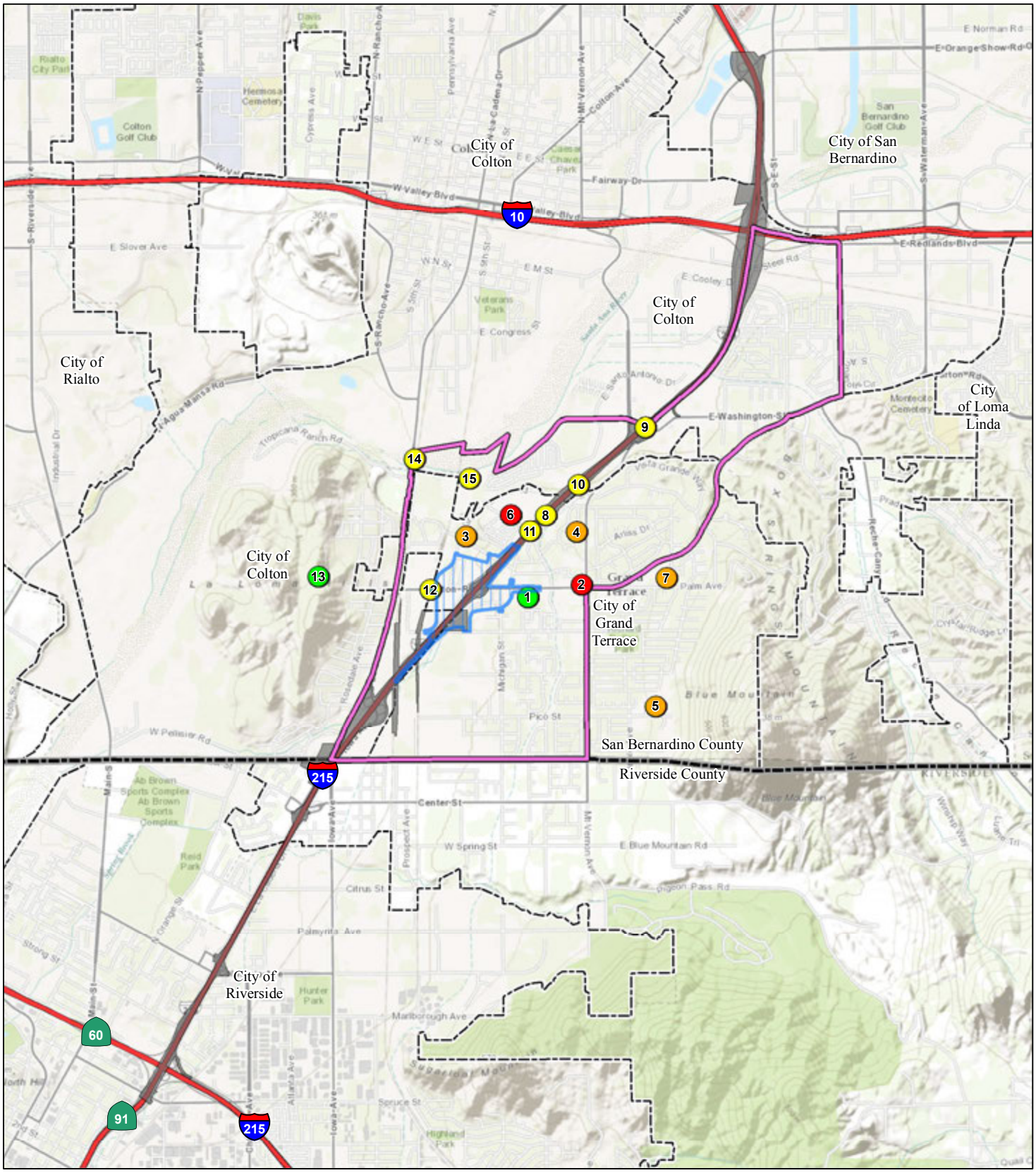
As specified in the Caltrans guidance, if the proposed Project would not result in a direct or indirect impact to a resource, it would not contribute to a cumulative impact on that resource, and need not be evaluated with respect to potential cumulative impacts. This cumulative impact analysis includes resources that would be potentially impacted by the Project and resources that are currently in poor or declining health, or that are at risk even if the Project's impacts to that resource would not be substantial.

The Project will not result in direct or indirect impacts to the following resources and, therefore, no discussion is provided:

- Farmlands or Timberlands
- Cultural Resources
- Floodplains
- Groundwater
- Paleontological Resources
- Natural Communities
- Wetlands
- Plant Species
- Animal Species
- Threatened and Endangered Species

2.21.4 Resources Evaluated for Cumulative Impacts

The following discussion of potential cumulative impacts is presented by environmental resource area. The reasonably foreseeable projects considered in this analysis are presented in Table 2.21.A and Figure 2.21.1. Table 2.21.A includes two commercial projects, four residential projects, one mixed-use project, one industrial project, and seven transportation facility projects. Most of the projects are infill projects, while the transportation projects are all along existing facilities. The following resources are evaluated in this section for cumulative impacts: community, visual/aesthetics, and surface water quality. In the context of the respective Resource Study Areas (RSAs), the three Build Alternatives studied would have a similar potential contribution to cumulative impacts.



LEGEND

- Project Area
- Community Impact RSA
- Visual/Aesthetics RSA
- City Boundaries
- County Boundary

Planned Projects*

- Commercial
- Mixed-Use
- Residential
- Transportation

0 2100 4200
FEET

FIGURE 2.21.1

I-215/Barton Road Interchange Improvement Project

Resource Study Areas (RSAs)

SOURCE: ESRI (2013); City of Grand Terrace (2013); City of Colton (2013); US Census 2010

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*Note: Locations are approximate.

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Table 2.21.A Planned Projects

Figure 2.1.3 Project ID Number	Project Name/Type	Location	Proposed Use/ Description	Status
City of Grand Terrace				
1	Town Square Master Development Plan	South side of Barton Road between Michigan Street/Gage Canal	209,611 sf over 5 development units; commercial, retail, and restaurant/fast food uses	Development Unit 1 (65,737 sf) approved with 45,000 sf already constructed. Auto Zone is moving one lot east to the Town Square project. Construction of the 7,842 sf building is anticipated to be completed in mid-2014.
2	Barton Plaza	Northwest corner of Barton Road and Mount Vernon Avenue	40,000 sf commercial	10,000 sf building constructed in Phase 1. Phases 2 and 3 have not started.
3	Techno-dynamics	21910 Vivienda Avenue	Single-family residential, 3 lots	Project approved. Project is not moving forward.
4	Greystone Group	11830 Mount Vernon Avenue	Single-family residential, 35 units	Project approved and map recorded. No construction has started.
5	Karger Pico Tract	North Side of Pico Street, east of Kingfisher Road	Single-family residential, 18 lots	Tentative tract map valid until 8/10/2016
6	SCE Office Building	22200 Newport Avenue (SCE Vista Substation)	12,257 sf office building	Approved 11/7/2013 by the Planning Commission.
7	Residential	12156 Preston Street	12 townhomes	Approved by the Planning Commission on December 19, 2013.
I-215 Freeway Projects				
8	I-215 Bi-County HOV Lane Gap Closure Project (SANBAG/ RCTC/Caltrans)	On I-215 between SR-60 and Orange Show Road	Add HOV lanes in each direction	Under construction. Planned for completion in late 2015.
9	I-215/Mount Vernon Avenue/Washington Street Interchange Improvement Project (SANBAG/Caltrans)	On I-215 at Mount Vernon Avenue/ Washington Street	Reconstruct interchange and local streets, add auxiliary lanes	Preliminary Engineering in progress. Planned for completion by 2020.
10	I-215 Bi-County Improvement Project (SANBAG/RCTC/ Caltrans)	On I-215 between SR-60 and Orange Show Road	Add one mixed-flow lane in each direction, add auxiliary lanes	Planned for completion prior to 2018.
11	Newport Avenue Overcrossing Over I-215 Reconstruction Project (SANBAG/Caltrans)	Over I-215 at Newport Avenue	Reconstruct overcrossing	Under construction. Planned for completion in mid-2014.
City of Colton				
12	The West Barton Road Connection	West Barton Road Bridge across the UPRR	Connection will provide for the ultimate design width for Barton Road of a 100 ft right-of-way.	Reprogramming funding. Planned for completion by 2015.
13	Pellissier Ranch Specific Plan	Pellissier Ranch Road	1,448 ac; 2,101 units residential, commercial, schools, parks	As of August 2012, this plan has been suspended indefinitely.
14	La Cadena Bridge over Santa Ana River Bridge Replacement Project	La Cadena Drive at the Santa Ana River	Reconstruct bridge	Preliminary Engineering. Planned for completion by 2017.
15	Washington Street Extension to La Cadena Drive Project	On Washington Street	Street extension and bridge over BNSF Railway	Project Study Phase. Planned for completion by 2030.

Sources: Sandra Molina, City of Grand Terrace Planning Manager (October 2013); Victor Ortiz, City of Colton Engineering Manager (July 2013); Mark Tomich, City of Colton Planning Director (October 2013).

2.21.4.1 Community

The RSA for cumulative community impacts consists of Census Tracts 71.06, 71.07, 71.09, and 71.10 within the Cities of Grand Terrace and Colton. Census tracts provide established boundaries for community demographics. As discussed in Section 2.3.1.2 of Section 2.3, Community Impacts, the four census tracts in the RSA are representative of the demographics of both Cities (with the exception of Census Tract 71.10, which represents the most affluent population among the study area census tracts).

The RSA was historically ranchland. The City of Colton was planned in conjunction with construction of the Southern Pacific Railway (currently the Union Pacific Railroad [UPRR]) and the start of industry in the late 19th century. Prior to World War II, the RSA was primarily a citrus-growing region that was transformed primarily to residential subdivisions with supporting retail. [1] Light industrial uses continue to be adjacent to the UPRR and the BNSF Railway. The development of predominantly commercial and industrial uses in the City of Colton resulted in the development of the City of Grand Terrace as a residential community. Currently, the RSA is characterized by residential subdivisions with commercial uses concentrated along Barton Road and the Interstate 215 (I-215) interchange and industrial uses adjacent to the railways.

Character and Cohesion

The RSA is an urban community bisected by I-215. The BNSF Railway and the UPRR provide a physical boundary to the west while the Santa Ana River borders the RSA to the north. Based on the analysis of demographic data and community cohesion indicators included in Section 2.3, Community Impacts, and the mix of land uses, the RSA does not exhibit a pronounced degree of community character and cohesion. In addition, the RSA's character as an urbanized community bisected by an existing regional transportation freeway (I-215) and a key primary arterial (Barton Road) also does not support a pronounced degree of community cohesion.

The Project involves a minor amount of residential and business displacements. The residences that would be potentially displaced are located in the vicinity of the freeway and are not part of a cohesive neighborhood. The businesses that would be potentially displaced are not key to community vitality based on the type of business.

[1] Information was summarized from the *Historical Resources Evaluation Report* for the I-215/ Barton Road Interchange Improvement Project (July 2011), which was based on information from several different sources.

The Build Alternatives would not divide an established community or substantially modify the character of the area. The Project is consistent with the circulation/mobility and land use elements of the City of Grand Terrace and City of Colton General Plans, which are the Cities' visions for the future through the year 2020 and 2030, respectively. Because the RSA is developed for the most part and the Project would not change the fundamental nature of the community, Project contribution of cumulative impacts to community character and cohesion are minimal.

With exception of the Pellissier Ranch Specific Plan, the planned projects shown on Figure 2.21.1 are infill projects surrounded by existing residential and commercial development. Approval of those projects by the respective City would be consistent with the respective City General Plan and vision for development of the area. Therefore, the planned development projects would not divide an existing community and would instead contribute toward improving community establishment and cohesion. The Pellissier Ranch Specific Plan is suspended indefinitely and may involve substantial revisions prior to implementation based on the City of Colton's decision to protect hillside development (refer to Section 2.2 Growth). The Mount Vernon Avenue-Washington Street Interchange Improvement Project and the I-215 Bi-County Improvement Project would displace freeway-adjacent businesses and residences. Although these projects combined would result in impacts to community cohesion, impacts are not anticipated to be substantial based on the nature of the RSA, as described above. The other bridge projects would not impact community cohesion.

Because the RSA does not display a pronounced degree of community cohesion, the planned development projects have the potential to support community character and cohesion, and the planned transportation projects would not divide the community or change community character, cumulative community character and cohesion would not be substantial.

Local Circulation

Because the RSA is bisected by I-215, local streets in vicinity of I-215 are used for access to I-215. This can result in congestion at interchanges during AM and PM peak hours such as the existing lack of available left-turn storage from westbound Barton Road to the southbound I-215 on-ramp. Left-turn queues prevent through traffic from moving through interchanges, and drivers are more likely to seek alternate local routes through neighborhoods. The I-215/Barton Road interchange has

constraints that discourage its use by large trucks; therefore, these trucks utilize other interchanges in the area and local roads to reach their destinations in the Project vicinity. In addition, alternative transportation is limited because many streets near the interchanges in the RSA do not have sidewalks, bicycle lanes, or crosswalks.

The Project would modify the alignment of some local roads in order to accommodate the new on- and off-ramps; however, access would be maintained to properties in the area. The Project would provide a new local access road adjacent to Grand Terrace Fitness Park; however, based on its location, this road would only be used by residents for local access and the road was planned during development of the park. The Project also includes standard sidewalks and bicycle lanes on Barton Road. The Project would also include signalized intersections with crosswalk facilities along Barton Road to eliminate the need for pedestrians to cross unsignalized traffic movements. These features would improve pedestrian access and improve pedestrian safety by reducing pedestrian-vehicular conflicts. Because the Project would improve local circulation and pedestrian and bicycle access, the Project would not contribute to cumulative local circulation impacts to the community.

The cumulative transportation projects would reduce congestion in the RSA along I-215, at the I-215/Mount Vernon Avenue-Washington Street interchange, and on Barton Road at the UPRR. The planned development projects would add or modify the number of trips associated with changes in property use and may require road improvements as part of project approval to support these developments. The *Revised Traffic Operations Analysis* evaluated the Project plus future planned growth in the RSA and concluded that study area intersections would improve in future conditions. Each individual planned development project would be required to mitigate for any local circulation impacts, and each transportation project would be required to maintain local circulation. Therefore, the Project, in combination with other planned projects would not cause a cumulative impact to local circulation in the RSA.

Noise

The primary source of noise in a community adjacent to a freeway is traffic. The sensitive receptors (e.g., residences, mobile home parks, RV park, and schools) along the freeway and primary arterial roads are exposed to the highest noise levels in the RSA. The communities in the RSA have been adjacent to a freeway for over 30 years.

Traffic noise level increases from the Build Alternatives would be minimal when compared to the No Build Alternative, as discussed in Section 2.13, Noise, and would

be reduced at sensitive receptors adjacent to the I-215/Barton Road northbound on-ramp and southbound off-ramp due to the sound barriers being constructed as part of the I-215 Bi-County High-Occupancy Vehicle (HOV) Lane Gap Closure Project, where no sound barriers currently exist. The Project's increase in traffic noise levels at receptors already exposed to traffic noise would be minimal.

Because the planned freeway projects would increase capacity and reduce congestion, they would likely increase traffic noise associated with additional vehicles traveling at faster speeds. The freeway projects would be required to evaluate the reasonability and feasibility of sound barriers to shield sensitive receptors from increased noise levels at locations where the Project would result in noise impacts. The planned residential projects in close proximity to the freeway or local roads would be required to analyze noise impacts and to construct sound barriers to shield the new sensitive receptors from traffic noise if noise levels would exceed local standards. The planned development projects (residential, offices, and retail) are not large noise-generating uses and are not anticipated to contribute to cumulative noise impacts in the RSA. Furthermore, the Project as analyzed in the *Noise Study Report* and the *Supplemental Noise Study Report*, along with planned future traffic volumes, does not cause a substantial noise impact. Therefore, the Project, in combination with other planned projects would not cumulatively alter the noise condition in the community.

Displacements

As discussed above, the RSA is bisected by I-215. Alternative 3 would displace up to 8 residences and 31 businesses, Alternative 6 would displace 2 residences and 19 businesses, and Modified Alternative 7 (the Preferred Alternative) would displace 2 residences and 21 businesses. However, the neighborhood residents do not depend solely on the businesses that would potentially be displaced for essential goods and services because there are similar types of businesses in the Project vicinity. As discussed in Section 2.3.1.3, Community Impacts, there are numerous businesses of similar types to those that would be potentially displaced within close proximity to the Project area. Therefore, there are replacement businesses available to the local community in case the displaced businesses could not be relocated near the interchange area.

Based on the results of the *Draft Relocation Impact Statement* and the *Final Relocation Impact Statement*, it is anticipated there are sufficient properties available for relocation of all the displaced businesses and residents in the Cities of Grand Terrace and Colton, with one possible exception. A gasoline station, which would

only be displaced if Alternative 3 became the approach to constructing the Project, might need to be relocated to the City of San Bernardino or another adjacent city. However, as noted previously, Modified Alternative 7 has been identified as the Preferred Alternative for the Project, and as such will be the basis for the Final Design and Construction phases of the Project.

Based on the business types that would be displaced by the Project, the majority of the displaced businesses are expected to serve the local as well as adjacent communities and, therefore, would be able to maintain their clientele after relocation.

The health of the RSA is not dependent on the businesses anticipated to be displaced as part of the Project. The community does not rely solely on the businesses potentially being displaced. In addition, the businesses would still be accessible to the community once relocated. Displacement of the businesses would not affect the health of the neighborhood, and no diminishment of the community would result. In addition, a relatively small number of businesses would be displaced, compared to the number of businesses that currently exist within the community. Because the Project would displace a limited number of residents, and would provide adequate relocation resources for displaced businesses, the Project's contribution to cumulative displacement impacts would be minimal.

The planned development projects would add or modify businesses or residences. Other than the I-215 Bi-County Improvement Project and the I-215/Mount Vernon Avenue-Washington Street Interchange Improvement Project, the transportation projects would not displace residents or businesses. Due to the freeway widening associated with the I-215 Bi-County Improvement Project, several businesses and residences directly adjacent to the freeway could be impacted. However, similar to the I-215/Barton Road Interchange Improvement Project, it is anticipated that the businesses could be relocated to surrounding areas and the residents would be relocated away from a freeway environment. Therefore, the I-215/Barton Road Interchange Improvement Project, in combination with other planned projects would not result in substantial cumulative impacts with respect to displacements in the community.

2.21.4.2 Visual/Aesthetics

The RSA for visual impacts is the footprint of the I-215 Bi-County HOV Lane Gap Closure Project, because this is the freeway segment that travelers utilize to access the I-215/Barton Road interchange to and from the freeway. The RSA is dominated by

the I-215 corridor; including the freeway mainline travel lanes, embankments, I-215 ramps, right-of-way, and adjacent development and roads. Landscaping in the RSA is typical of freeway corridors and includes grasses, low-lying shrubs, and some trees. The existing visual character of the study area is urban. The areas surrounding the I-215 right-of-way are characterized by moderate-density development, infrastructure, and open space/vacant land. Land uses within and surrounding the RSA are predominantly transportation (roads and railroads), commercial, and residential, with some agricultural uses east of I-215 in the Cities of Riverside and Grand Terrace. Visual resources that can be seen from the RSA include Blue Mountain, the La Loma Hills, and Box Springs Mountain; however, existing views of these resources are limited due to climatic conditions (i.e., smog), development, sound barriers, and/or freeway signs. In addition, they are not City- or State-designated visual resources.

As discussed in Section 2.6, Visual/Aesthetics, Alternatives 3 and 6 would result in a reduction in visual quality; however, this reduction would not be substantial because the views would be consistent with views of and around a freeway. Overall, Modified Alternative 7 would improve the key views. View points within the RSA do not currently have unobstructed views of visual resources such as the La Loma Hills or Blue Mountain. Therefore, implementation of any of the Build Alternatives would have a low-level visual impact due to the existing visual quality, and any impact to visual resources resulting from the Build Alternatives studied for the Project would be minimal.

Caltrans has developed the *I-215 Bi-County Aesthetic Concept* for the I-215 corridor between State Route 60 (SR-60) and Orange Show Road. The purpose of this concept is to provide for consistent landscaping, minimize aesthetic impacts throughout the corridor, and apply the concept to all planned freeway projects in the area including the Project.

The I-215 Bi-County HOV Lane Gap Closure Project includes construction of sound barriers that would obstruct views of I-215, freeway signs, and traffic on I-215. Because of implementation of the *I-215 Bi-County Aesthetic Concept* and the reduction of freeway traffic views for some sensitive viewers in the area, the Project is considered to be potentially providing some net benefit from some views. Although the cumulative transportation projects may include additional sound barriers, due to the existing conditions that obstruct views of the hills and mountains, and the fact that

the sound barriers would reduce views of freeway traffic and signs, there would be a net beneficial impact.

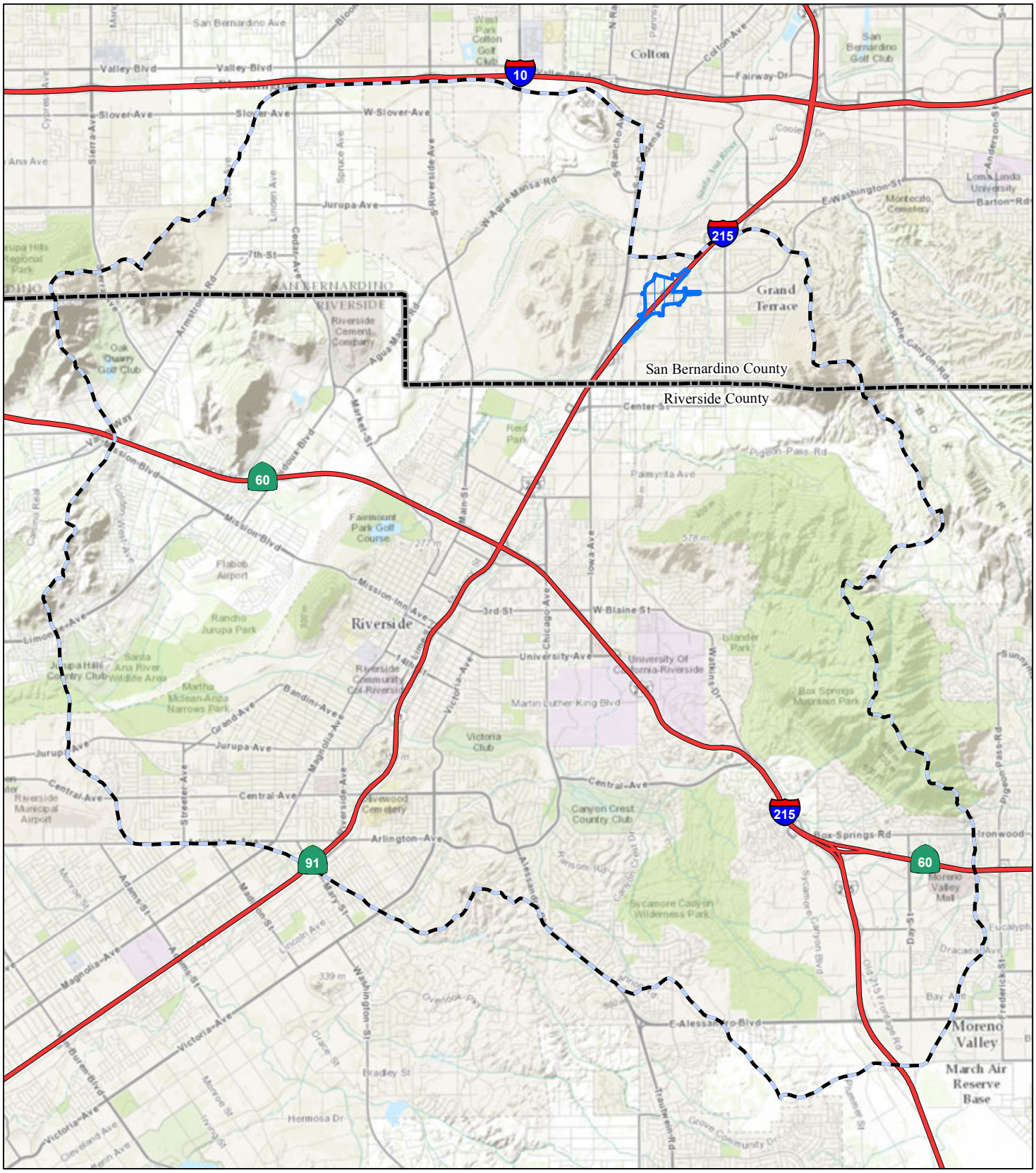
Planned development projects in the I-215 corridor vicinity would replace landscaping and construct sound barriers consistent with local standards. Because the planned development projects are primarily infill projects, and the Cities of Grand Terrace and Colton have aesthetic standards for development, visual/aesthetic impacts associated with the planned development projects would be minimal.

The Project, when combined with the other cumulative projects in the RSA, would provide a net beneficial visual impact from the additional sound barriers and replacement landscaping consistent with Caltrans and local requirements. Therefore, the Project in combination with other planned projects would not result in cumulative visual/aesthetic impacts.

2.21.4.3 Surface Water Quality

The RSA for cumulative impacts to surface water quality is the Riverside subwatershed (hydrologic sub-area) of the Middle Santa Ana River Watershed (hydrologic area) because the Project site is tributary to this watershed. The Riverside subwatershed is generally bound by Interstate 10 (I-10) on the north, the Box Spring Mountains on the east, Arlington Avenue in the City of Riverside on the south, and the Pedley Hills on the west and is shown in Figure 2.21.2. The Santa Ana River is the primary receiving water in the RSA. With exception of the Santa Ana River itself, the RSA is highly urbanized. The existing trend of urbanization in the Santa Ana River Watershed is projected to continue. Conversion of undeveloped land to transportation, commercial/industrial, retail, and residential uses results in hydromodification and increased loading of pollutants into surface waters and indirectly into groundwater. It also introduces new sources of pollutants associated with the new land uses.

As discussed in the *Water Quality Technical Study* (October 2013), the quality of surface water in the Santa Ana River Basin, in general, becomes progressively poorer as water moves along hydraulic flow paths. The highest quality water is typically associated with tributaries flowing from the surrounding mountains. Water quality is altered by a number of factors, including consumptive use, importation of water high in dissolved solids, runoff from urban and agricultural areas, and the recycling of water within the Santa Ana River Basin. Historically, the Santa Ana River and its major tributaries flowed year-round; however, diversion for irrigation has resulted in



LEGEND

- Project Area
- County Boundary
- Surface Water Quality RSA

FIGURE 2.21.2

0 0.75 1.5
MILES

SOURCE: ESRI (2013); CalWater (2004)

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I-215/Barton Road
Interchange Improvement Project
Surface Water Quality Resource Study Area

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decreased flow and groundwater recharge. Primary water quality concerns in the Middle Santa Ana River Basin include total dissolved solids (TDS), total inorganic nitrogen levels, contaminant plumes in groundwater, bacterial quality of surface waters, and impacts from confined animal feeding operations. Reach 4 of the Santa Ana River (from Mission Boulevard in Riverside to the San Jacinto Fault in San Bernardino) is listed as impaired for pathogens on the 2010 California 303(d) List of Water Quality Limited Segments.

The Project would impact two concrete channels in the RSA as a result of the extension of existing culverts to accommodate new ramps. The Project would only affect water quality during storm events, because the Project would not generate dry weather discharge or disturb natural drainages. The Project would comply with the requirements of the Construction General Permit, the Caltrans Storm Water Management Plan (SWMP), and Caltrans and City National Pollutant Discharge Elimination System (NPDES) permit requirements. In addition, the Project includes treatment best management practices (BMPs) to target pollutants of concern in storm water runoff. Based on an urbanized RSA, limited impacts, and application of regulatory requirements, the contribution of the Project to cumulative impacts to surface water quality is not considerable.

The I-215 Bi-County HOV Lane Gap Closure Project would also impact concrete channels as well as earthen channels in the Project area through the extension of culverts. The I-215 Bi-County HOV Lane Gap Closure Project, I-215 Bi-County Improvement Project, and the La Cadena Bridge over Santa Ana River Bridge Replacement Project would directly impact the Santa Ana River through replacement of bridge columns in the river. Planned transportation projects in the area are anticipated to impact channels/streams that cross these facilities, and development projects may result in minor impacts to improved channels in order to accommodate changes in drainage patterns.

With the exception of the La Cadena Bridge over Santa Ana River Bridge Replacement Project, the I-215 Bi-County HOV Lane Gap Closure Project, and the I-215 Bi-County Improvement Project, the planned projects would have minimal impacts to the Santa Ana River because they would not directly impact the river. Because of the urban nature of the RSA, impacts to surface waters would mostly occur to engineered flood control channels. The planned projects are also expected to impact only small drainage areas. Each project is responsible for addressing its impacts to surface water quality and must comply with water quality regulations. The

NPDES program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Since its introduction in 1972, the NPDES program has been responsible for water quality improvements in the State.[1] The planned projects would be required to comply with NPDES regulations, implement BMPs, and mitigate for direct impacts to surface waters through habitat replacement, restoration, or enhancement. Therefore, the Project, in combination with other planned projects would not result in substantial cumulative water quality impacts.

2.21.5 Avoidance, Minimization, and/or Mitigation Measures

No measures beyond those identified in Sections 2.1 through 2.20 are required to address cumulative impacts.

[1] State Water Resources Control Board. National Pollutant Discharge Elimination System (NPDES) (http://www.waterboards.ca.gov/water_issues/programs/npdes/, accessed October 28, 2013).