# VISUAL IMPACT ASSESSMENT

# PROPOSED INTERSTATE 5 HOV LANES IMPROVEMENTS BETWEEN STATE ROUTE 55 AND STATE ROUTE 57 PROJECT

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**Caltrans District 12**


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# TABLE OF CONTENTS

**Section** **Page**


1.0 PURPOSE OF STUDY ..... 5

2.0 PROJECT DESCRIPTION ..... 6
- 2.1 Project Location ..... 6
- 2.2 Project Description ..... 6
  - 2.2.1 Alternatives ..... 6
    - 2.2.1.1 Alternative 2A ..... 9
    - 2.2.1.2 Alternative 2B ..... 9
    - 2.2.1.3 Alternative 5A ..... 10
    - 2.2.1.4 Alternative 5B ..... 10
  - 2.2.2 Design Options ..... 10
    - 2.2.2.1 Option A ..... 11
    - 2.2.2.2 Option B ..... 11

3.0 ASSESSMENT METHOD ..... 13

4.0 VISUAL ENVIRONMENT OF THE PROJECT ..... 14
- 4.1 Project Setting ..... 14
- 4.2 Landscape Units ..... 16
- 4.3 Project Viewshed ..... 16

5.0 EXISTING VISUAL RESOURCES AND VIEWER RESPONSE ..... 17
- 5.1 FHWA Method of Visual Resources Analysis ..... 17
- 5.2 Existing Visual Resources ..... 17
  - 5.2.1 Existing Visual Character ..... 17
  - 5.2.2 Existing Visual Quality ..... 21
- 5.3 Methods of Predicting Viewer Response ..... 21
- 5.4 Existing Viewer Sensitivity ..... 21
  - 5.4.1 City of Tustin Existing Viewer Sensitivity ..... 21
  - 5.4.2 City of Santa Ana Existing Viewer Sensitivity ..... 22
  - 5.4.3 City of Orange Existing Visual Sensitivity ..... 24
- 5.5 Existing Viewer Groups, Viewer Exposure, and Viewer Awareness ..... 25

6.0 VISUAL IMPACT ASSESSMENT ..... 26
- 6.1 Method of Assessing Project Impacts ..... 26
- 6.2 Definition of Visual Impact Levels ..... 26
- 6.3 Analysis of Key Views ..... 27
- 6.4 Summary of Project Impacts ..... 34
- 6.5 Cumulative Impacts ..... 35

7.0 VISUAL MINIMIZATION/MITIGATION ..... 36

8.0 REFERENCES ..... 37

## LIST OF FIGURES

**Figure** **Page**

Figure 1: Regional Map ..... 7
Figure 2: Existing View Point Map ..... 18
Figure 3: Existing Views ..... 19
Figure 4: Existing Views ..... 20
Figure 5: Key View Point Map ..... 28
Figure 6: Key View 1 ..... 29
Figure 7: Key View 2 ..... 32

## LIST OF TABLES

**Table** **Page**

Table 1: Summary of Visual Quality Change to Key View 1 ..... 30
Table 2: Summary of Visual Quality Change to Key View 2 ..... 33

# 1.0 PURPOSE OF STUDY

The purpose of this Visual Impact Assessment (VIA) is to assess the visual impacts of the Proposed Interstate 5 HOV Lanes Improvements between State Route 55 and State Route 57 Project (proposed project) and to propose measures to mitigate any adverse visual impacts associated with the construction of the proposed project on the surrounding visual environment.

# 2.0 PROJECT DESCRIPTION

## 2.1 PROJECT LOCATION

The proposed project is located within the cities of Tustin, Santa Ana, and Orange in the County of Orange, as shown on Figure 1. Specifically, the proposed project is located on the Interstate 5 (I-5) from north of State Route 55 (SR-55) Interchange, post mile (PM) 29.1, to south of State Route 57 (SR-57) Interchange, PM 34.00. The total length of the proposed project is approximately 3.9 miles.

## 2.2 PROJECT DESCRIPTION

The land uses adjacent to the proposed project consist of the following:

**City of Tustin**

- High Density Residential
- Medium Density Residential
- Mobile Home Park
- Professional Office
- Public/Institutional

**City of Santa Ana**

- Medium Density Residential
- Low Density Residential
- Urban Neighborhood
- Professional & Admin. Office
- District Center
- Open Space
- General Commercial
- Industrial

**City of Orange**

- Medium Density Residential
- Low Density Residential
- Low Medium Residential
- General Commercial Max.

It should be noted that these land uses are within a 300-ft buffer from the Caltrans' right-of-way (ROW). This 300-ft buffer is referred to as the Study Area.

### 2.2.1 ALTERNATIVES

The proposed improvements include the addition of one HOV lane in each direction on I-5 to provide additional HOV capacity and reduce congestion. In addition, improvements to the First Street Entrance ramp to SB I-5 is proposed to improve operations in the general purpose lanes. All proposed improvements would be constructed within

Source: ESRI 2011

0 2 4 8 Miles

Scale: 1:250,000; 1 inch = 4 miles

**Figure 1**
**Regional Map**

I-5 (SR55 to SR57) HOV Lanes Improvement Project

*Path: P:\2011\60220190\06GIS\6.3_Layout\OCTA_I-5\regional_map2.mxd, 8/20/2012, LeeDA*

Caltrans' existing ROW limits. In addition, temporary construction related activities (staging areas and easements) would also be located within Caltrans' ROW limits. The following are proposed project related improvements that would be consistent across both of the proposed build alternatives (Alternatives 2A/2B and Alternatives 5A/5B), which are discussed in greater detail below.

- The following entrance/exit ramp gore areas would be slightly adjusted to accommodate the HOV widening:
    - SB I-5 Grand Avenue HOV entrance ramp
    - SB I-5 to Santa Ana Boulevard exit ramp
    - 17th Street to SB I-5 entrance ramp
    - SB I-5 to 17th Street exit ramp
    - NB I-5 to 17th Street exit ramp
    - SB I-5 to Main Street/Broadway exit ramp
    - Santa Clara Avenue to NB I-5 entrance ramp
    - Westbound (WB) SR-22 to NB I-5 entrance ramp
    - Eastbound (EB) SR-22 to SB I-5 connector
    - SB I-5 to EB SR-22 connector
    - Northbound (NB) I-5 to NB SR-57 connector
    - Main Street to SB I-5 Entrance ramp
- Reconstruction or the new construction of retaining walls, within the State ROW limits and along the proposed edge of shoulder at select locations to accommodate freeway widening and ramp reconstruction.
- Closure of the HOV barrier gap (between Lincoln Avenue and north of 17th Street) and relocation of the existing HOV concrete barriers on the northbound (NB) side of I-5 between Lincoln Avenue and the Santa Clara Avenue over-crossing entrance ramp.
- Relocation of the existing center median concrete barrier at various locations to facilitate the HOV lane additions.
- Relocation of the existing drainage inlets along the existing concrete barriers. These inlets would need to be removed and reconstructed in new locations accordingly.
- There are design options that would apply to each of the two build alternatives under evaluation. These design options involve existing structures that may be removed, including the Main Street HOV drop exit and entrance ramps and the SB I-5 First Street "horseshoe" exit ramp. These SB I-5 first Street ramp design options are independent of the HOV alternative selected. Additional detail is provided below following the Alternatives 2A/2B and Alternatives 5A/5B descriptions.
- Relocate overhead sign structures to allow freeway widening and install new overhead sign structures that tailor the two HOV build alternatives.
- Construct Storm Water Treatment BMPs where feasible within the existing right of way.

#### 2.2.1.1 ALTERNATIVE 2A

This alternative is a combination of both Alternatives 2 and 4 originally from the previously prepared Project Study Report (PSR) (Caltrans District 12; November 2010), that would eliminate or minimize some of the design exceptions from the two separate alternatives. Alternative 2A proposes the following design features:

- Remove existing concrete barriers located between the HOV-1 lane and General Purpose (GP) lanes and construct new concrete barriers approximately 2-ft to 6-ft towards the existing freeway centerline.
- Add new concrete barrier to continuously separate the two HOV lanes.
- Reconstruct drainage inlets along relocated/new concrete barriers, as required.
- The new HOV-2 lane would be added in the GP area with *continuous ingress/egress* striping throughout the project limits.
- The modified HOV-1 facility would feature a modified left shoulder, the HOV-1 lane and a modified right shoulder.
- The HOV-2 and adjacent GP lanes would consist of a modified left shoulder, the HOV-2 lane, four GP lanes, and a modified right shoulder.
- Three GP lanes (in each direction) between 17$^{th}$ Street to SB I-5 entrance ramp and Broadway Bridge would be reduced to 11-ft to avoid widening the 17$^{th}$ Street Undercrossing, avoid reconstructing 900-ft of sound wall on retaining wall, avoid reconstruction of the Main Street to SB I-5 entrance ramp and to clear existing bridge columns.
- California Highway Patrol (CHP) Enforcement Areas would be constructed between 17$^{th}$ Street and Main Street SB direction and between Broadway OC and SR-22 EB Connector OC NB direction and only used for the HOV-1 lane.
- This alternative would require the construction of Tie-Back retaining walls on NB and SB sides of I-5 at Lincoln Avenue Overcrossing and NB I-5 at SR-22 freeway abutment to accommodate the widening.
- Relocation of five overhead cantilevered sign structures and installation of overhead sign structures for the new HOV-1 and HOV-2 lane configurations would be required.
- Reconstruct pump station inlet and stairway on SB I-5 side near Lincoln Avenue Bridge.

All improvements would be within the existing freeway/roadway right-of-way boundaries.

#### 2.2.1.2 ALTERNATIVE 2B

Alternative 2B includes the same improvements as Alternative 2A. However, this alternative would remove the Main Street HOV Drop entrance and exit ramps.

#### 2.2.1.3 ALTERNATIVE 5A

This alternative is a combination of the previously prepared PSR Alternatives 2, 3, and 4 features. This combination of the features would require the least amount of design exceptions. Alternative 5A proposes to add the new HOV-2 lane adjacent to the existing HOV-1 lane and has the following design features:

- Removes the existing concrete barriers located between the HOV-1 lane and the GP lanes providing a *continuous ingress/egress* striping throughout the project limits, except at bridge columns.
- New SB/NB separated concrete barriers would be constructed closer to the freeway centerline from the existing barrier location in order to make room and eliminate design exceptions.
- In each direction on I-5, the HOV facility would feature a modified left shoulder, the two HOV-1 and HOV-2 lanes and a modified right shoulder that exists between the HOV lanes and the GP lanes at bridge columns.
- In each direction on I-5, there will be five GP lanes, with a modified right shoulder and a modified left shoulder that exists between the GP lanes and the HOV lanes at the bridge columns.
- California Highway Patrol (CHP) Enforcement Areas would be constructed between 17$^{th}$ Street and Main Street in the SB direction and between Broadway OC and SR-22 EB Connector OC in the NB direction.
- This alternative would require the construction of a Tie-Back retaining wall on the SB side of I-5 at Lincoln Avenue Overcrossing.
- Relocation of two overhead sign structures and installation of overhead sign structures for the new HOV-1 and HOV-2 lane configurations would be required.
- Reconstruct pump station inlet and stairway on SB I-5 side near Lincoln Avenue Bridge.

All improvements would be within the existing freeway/roadway right-of-way boundaries.

#### 2.2.1.4 ALTERNATIVE 5B

Alternative 5B includes the same improvements as Alternative 5A. However, this alternative would remove the Main Street HOV Drop entrance and exit ramps.

### 2.2.2 DESIGN OPTIONS

The following design options (Option A and B) may be combined with any of the above Alternatives (2A, 2B, 5A, and/or 5B):

| | |
|---|---|
| • Alternative 2A with Design Option A | • Alternative 5A with Design Option A |
| • Alternative 2A with Design Option B | • Alternative 5A with Design Option B |
| • Alternative 2B with Design Option A | • Alternative 5B with Design Option A |
| • Alternative 2B with Design Option B | • Alternative 5B with Design Option B |

2.2.2.1 OPTION A

This design option would close the existing I-5 SB entrance ramp at First Street and construct an entrance ramp at the Fourth Street interchange. This will result in approximately 825-ft increase of weaving length (1,550-ft to 2,375-ft) along SB I-5 between the Fourth Street entrance ramp and SR-55.

Proposed Engineering Features:

- Remove the existing First Street to SB I-5 entrance ramp and construct a new entrance ramp at Fourth Street to create a full diamond interchange. Remove the traffic signal at First Street and SB I-5 entrance ramp and restripe the entrance ramp to I-5 mainline and reconstruct the gore area.
- Close NB I-5 "horseshoe" exit ramp to Mabury Street/First Street, add a 2nd left turn lane on the NB I-5 exit ramp to WB Fourth Street and restripe portions of the NB exit ramp at this location.
- Convert the EB Fourth Street inside thru lane to a 2nd left turn lane to the NB I-5 entrance ramp.
- Reconfigure Mabury Street into a two-way street from Palm Street to First Street and modify the Mabury Street/First Street intersection accordingly. Add a left turn lane at EB First Street to NB Mabury Street. Close existing access to Mabury Street from Fourth Street.
- Restripe portions of First Street, Fourth Street, and Mabury Street to ensure operational continuity. Remove a portion of the existing slope and construct retaining (Tie-Back) wall in front of the existing west abutment of the First Street Overcrossing and the adjacent storm water pump station.
- For the existing storm water pump station, relocate maintenance access and reconstruct stair access to the ramp shoulder.
- Install new lighting, ramp metering system and CHP Enforcement Area at the new Fourth Street entrance ramp.

2.2.2.2 OPTION B

This design option would close the existing SB I-5 entrance ramp at First Street and construct an entrance loop ramp on the vacant parcel between First Street and Fourth Street and between Mabury Street and SB I-5 mainline within City and Caltrans right of

way. This would result in a 725-ft increase of the weaving length (1,550-ft to 2,275-ft) along the SB I-5 between the proposed First Street entrance loop ramp and the SB I-5 to SB SR-55 connector.

Proposed Engineering Features:

- Remove First Street entrance ramp and construct the new entrance loop ramp within the vacant parcel between First Street, Fourth Street and SB I-5 mainline. Remove traffic signal at First Street and SB I-5 entrance ramp. Restripe entrance ramp to mainline and reconstruct the gore area.
- Construct two retaining walls to support exterior curve of new entrance loop ramp
- Modify NB I-5 exit ramp to Mabury Street/First Street to remove the 2$^{nd}$ ramp lane prior to the interface with Mabury Street.
- Remove a portion of the existing slope and construct retaining (Tie-Back) wall in front of the existing west abutment of the First Street Overcrossing and the adjacent storm water pump station.
- For the existing storm water pump station, relocate maintenance access and reconstruct stair access to the ramp shoulder.
- Reconfigure Mabury Street as a two-way street, modify Mabury Street/First Street intersection accordingly. Add dual left turn lanes at EB First Street and an exclusive right turn lane for WB First Street to NB Mabury Street/SB I-5 entrance ramp.
- Restripe portions of First Street, South Elk Lane and Mabury Street to ensure operational continuity.
- Install new lighting, ramp metering system and CHP Enforcement Area at the new entrance loop ramp.

## 3.0 ASSESSMENT METHOD

The process used in this VIA generally follows the guidelines outlined in the publication *Visual Impact Assessment for Highway Projects*, Federal Highway Administration (FHWA), March 1981.

Six steps required to assess visual impacts were performed. They are as follows:

A. Define the project setting and viewshed.
B. Identify key views for visual assessment.
C. Analyze existing visual resources and viewer response.
D. Depict the visual appearance of project alternatives.
E. Assess the visual impacts of project alternatives.
F. Propose methods to mitigate adverse visual impacts.

# 4.0 VISUAL ENVIRONMENT OF THE PROJECT

## 4.1 PROJECT SETTING

The regional landscape establishes the general visual environment of the proposed project, but the specific visual environment upon which this assessment will focus is determined by defining landscape units and the project viewshed. A summary of the project regional landscape is provided below.

Orange County is made up of a rectangular land mass trending approximately 40 miles along the coast of the Pacific Ocean and extending inland approximately 20 miles, covers 798 square miles (*Orange County General Plan*, p. VI-24). The area is predominantly an alluvial plain, typically below 300 feet in elevation in the west and central sections. Several low-lying mesas interrupt this plain along the northern coast (*Ibid*.). The plain is semi-enclosed by the Santiago Foothills and the Santa Ana Mountains which rise to 5,600 feet on the east, the Puente and Chino Hills in the north, and the San Joaquin Hills to the south (*Ibid*.).

While Orange County consists of a diverse combination of mountains, hills, flatlands, and shoreline, the north central portion of Orange County where the proposed project is located is largely urbanized. The proposed project begins in the City of Tustin at I-5 and SR-55 interchange, then traverses north through the City of Santa Ana, and ends just north of the I-5 and SR-57 interchange in the City of Orange. A discussion of the land uses in each city in relation to the proposed project is described below.

<u>City of Tustin</u>

The City of Tustin is located in central Orange County and encompasses an area of 11.08 square miles (*City of Tustin General Plan*, p. 1). The City of Tustin is bounded to the south by the City of Irvine, to the north by the unincorporated portions of the County of Orange and the City of Orange, to the west by the City of Santa Ana, and to the east by unincorporated County territory and the City of Irvine (*Ibid*.). The City of Tustin is primarily built-out with minimal anticipated growth, with the exception of the Tustin Legacy development (*City of Tustin Hazard Mitigation Plan*, p. 2-3). As the City of Tustin is currently developed, there is a broad range of housing types and styles; a range of shopping, professional and commercial services; and light industrial areas (*Ibid*.). The southern end of the proposed project at I-5 and SR-55 interchange is surrounded by residential, mobile home park, and public/institutional land uses.

According to the City of Tustin's General Plan (2008), the proposed project has a Transportation Corridor land use designation. Specifically, the Transportation Corridor designation applies to the land within the corridors for I-5, SR-55, the Atchison, Topeka and Santa Fe railway, and Circulation Element roadways (*City of Tustin General Plan*, p. 44). Lands within these corridors are reserved for transportation purposes as the primary use. Secondary uses, such as open space linkages and landscaped areas, public and

private parking areas, and other transportation-related activities and facilities are also allowed.

City of Santa Ana

The majority of the proposed project crosses through the City of Santa Ana. The City of Santa Ana serves as the governmental and cultural center of Orange County and is one of the largest cities in California with a population over 300,000 (*City of Santa Ana General Plan*, p. 5). The City of Santa Ana is almost fully developed, consisting of approximately 58 percent residential development, 15 percent commercial uses, 14 percent industrial, 11 percent public and institutional uses, and two percent public parkland and open space (*Ibid*., p. 6). To the east, the Santa Ana Mountains frame the urban skyline of the City of Santa Ana as one travels north along I-5 between SR-55 and SR-57. The landform along I-5 within the project area is typical of the region and is relatively consistent from the SR-55 to the SR-57.

While there are no Orange County-designated scenic highways that run through the City of Santa Ana, a number of major transportation system and open space systems, such as the freeways, the Santa Ana River, Santiago Creek, and Harbor Boulevard, are of regional significance because many residents of Orange County form their image of Santa Ana from their travels along these corridors (*City of Santa Ana General Plan*, p. 9). The City of Santa Ana considers the Newport (SR-55), Santa Ana (I-5), and Garden Grove (SR-22) Freeways "high-speed scenic corridors" that operate at a regional scale. The project site is located within I-5 high-speed scenic corridor.

City of Orange

The City of Orange is an urbanized city where residential development represents the predominant land use with housing covering 46 percent of the City of Orange's land area (*City of Orange General Plan*, p. LU-10). Commercial and industrial uses represent approximately 14 percent of the City of Orange's land area, while natural hillsides, parks, and open space represent 32 percent (*Ibid.*). The I-5 and SR-57 interchange, the northern end of the proposed project, is located just south of the Uptown Orange Focus Area identified in the Land Use Element of the City of Orange's General Plan (2010). A focus area represents a location in the City of Orange where future land use change may occur (*Ibid*.). Each focus area has unique future development objectives, responding to priorities established in the City of Orange's Vision and input from the community (*Ibid.*). The Uptown Orange Focus Area, the most urban of the City of Orange's focus areas, adjoins the cities of Anaheim, Garden Grove, and Santa Ana, where substantial higher-density development is already underway. This focus area consists of a mix of major destination uses, including shopping (i.e., The Block at Orange), entertainment, offices, hotels, a hospital, and also residential uses. The land use plan for this focus area features an Urban Mixed-use designation for most of the focus area, which provides for integrated commercial retail, professional office, housing and civic uses. According to the City of Orange General Plan, convenient transit access, innovative housing options, and pedestrian-oriented design will be encouraged in this focus area (*Ibid*.).

## 4.2 LANDSCAPE UNITS

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.

Although the proposed project traverses through several districts within the City of Santa Ana (a total of nine districts, as described below) and crosses through a small portion of the cities of Tustin and Orange at I-5 and SR-55 interchange and I-5 and SR-57, respectively, the landscape is perceived as a single-type throughout its length. Decorative sound walls and landscaped slopes align either side of I-5 from the SR-55 to SR-57. Views of residential homes and commercial buildings can be seen above the walls and through the ornamental vines and trees along slopes adjacent to I-5. The general landform and vegetative cover throughout the project site are visually consistent and no atypical visual features are present. Therefore, this VIA analyzes the length of the proposed project as a single landscape unit.

## 4.3 PROJECT VIEWSHED

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

The viewshed for the proposed project is the landscape that is visible from I-5 within the project limits between SR-55 and SR-57.

# 5.0 EXISTING VISUAL RESOURCES AND VIEWER RESPONSE

## 5.1 FHWA METHOD OF VISUAL RESOURCE ANALYSIS

**Identify Visual Character** – Visual character is descriptive and non-evaluative which means it is based on defined attributes that are neither good nor bad in themselves. A change in visual character cannot be described as having good or bad attributes until it is compared with the viewer response to that change. If there is public preference for the established visual character of a regional landscape and resistance to a project that would contrast that character, then changes in the visual character can be evaluated.

**Assess Visual Quality** – Visual quality is evaluated by identifying the vividness, intactness and unity present in the viewshed. The FHWA states that this method should correlate with public judgments of visual quality well enough to predict those judgments. This approach is particularly useful in highway planning because it does not presume that a highway project is necessarily an eyesore. This approach to evaluating visual quality can also help identify specific methods for mitigating each adverse impact that may occur as a result of a project. The three criteria for evaluating visual quality can be defined as follows:

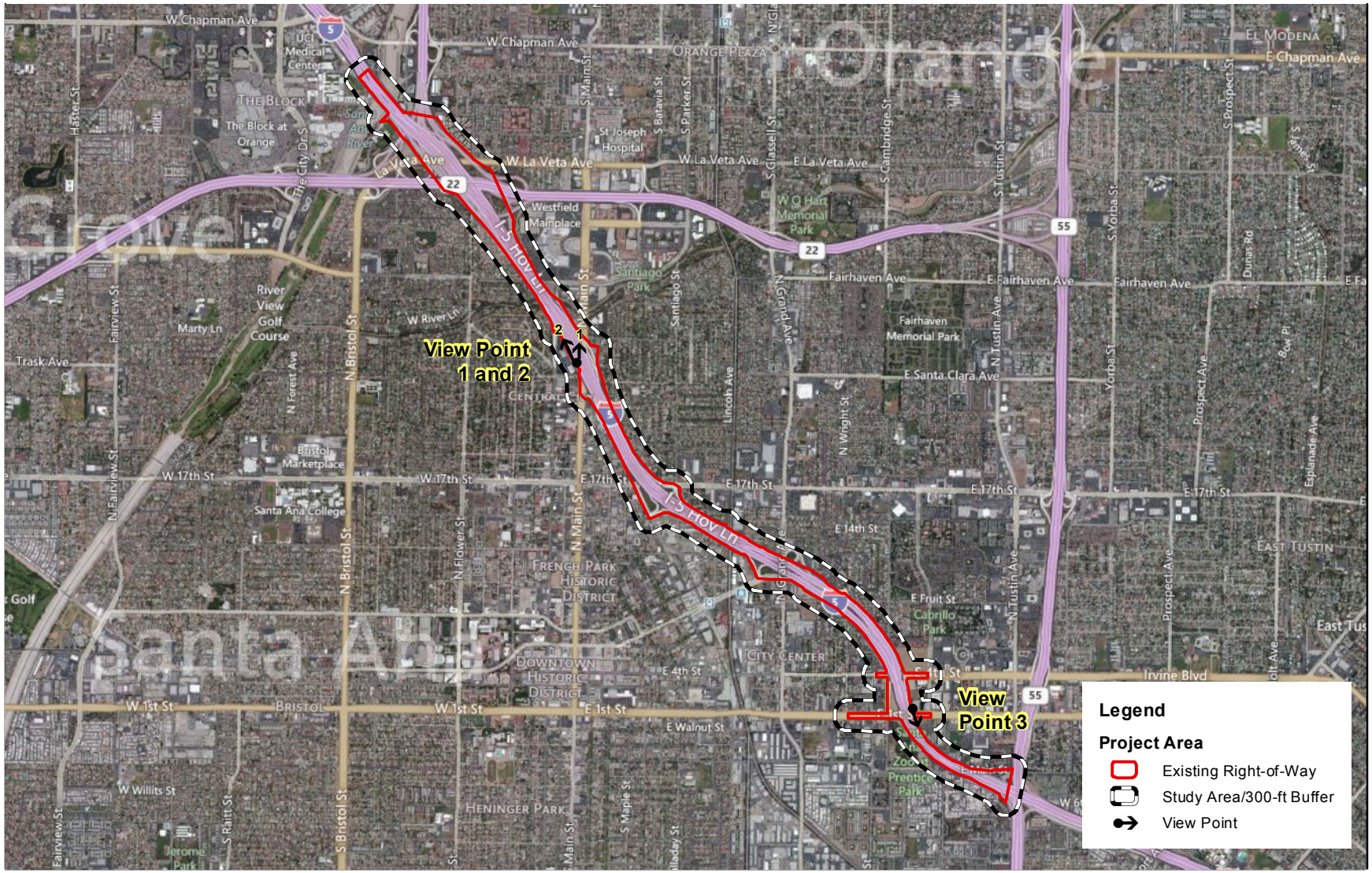
> **Vividness** is the visual power or memorability of landscape components as they combine in distinctive visual patterns.
>
> **Intactness** is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, 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 manmade components in the landscape.

## 5.2 EXISTING VISUAL RESOURCES

Existing views of the project area are provided in Figures 3 and 4. Figure 2 shows a map illustrating the location and direction of the existing views presented in Figures 3 and 4.

### 5.2.1 Existing Visual Character

The existing visual character of the project site and surrounding area is urban, consisting mostly of residential and commercial uses, with some public/institutional and open space. Decorative sound walls and landscaped slopes align I-5 from SR-55 to SR-57, constraining most views along the east and west edges of the freeway.




Source: ESRI 2012; AECOM 2012

0 1,750 3,500 7,000 Feet

Scale: 1:42,000; 1 inch = 3,500 feet

**Figure 2**
**Existing View Point Map**



*Path: P:\2011\60220190\06GIS\6.3_Layout\View Study\Ex_ViewPoint_Map.mxd, 8/20/2012, LeeDA*

**View 1**

**This view is from the Rancho Santiago Community College parking lot, looking north at the Interstate 5 freeway toward the Main Street HOV drop exit and entrance ramp.**

**View 2**

**This view is from the Rancho Santiago Community College parking lot, looking northeast at the Interstate 5 freeway toward the Main Street HOV drop exit and entrance ramp.**

Source: AECOM

**Figure 3**
**Existing Views**

**View 3**

**This view is from the Xerox parking structure near the First Street and Fourth Street off-ramp, looking south toward the Interstate 5 freeway.**

Source: AECOM

**Figure 4**
**Existing Views**

### 5.2.2 Existing Visual Quality

The project site has level topography and a largely uniform urban setting. There are some strong memorable urban landscape features that are immediately adjacent to the project site, such as the City of Santa Ana Water Tower, which offers some vividness to a part of the surrounding area of the project site. Overall, the vividness of the landscape unit is moderate. The general landform and vegetative cover throughout the project site and surrounding area are visually consistent and no atypical visual features are present. In addition, as stated above, most views along the east and west edges of I-5 between SR-55 and SR-57 are constrained by sound walls and ornamental vegetation. Thus, the intactness and unity of the landscape unit is moderate. Overall, the project site and surrounding area have a moderate visual quality.

## 5.3 METHODS OF PREDICTING VIEWER RESPONSE

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 highway project.

**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 resource 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. Analysts can learn about these special resources and community aspirations for visual quality through citizen participation procedures, as well as from local publications and planning documents.

**Viewer exposure** is typically assessed by measuring the number of viewers exposed to the resource change, type of viewer activity, duration of their view, speed at which the viewer moves, and position of the viewer. High viewer exposure heightens the importance of early consideration of design, art, and architecture and their roles in managing the visual resource effects of a project.

## 5.4 EXISTING VIEWER SENSITIVITY

### 5.4.1 City of Tustin Existing Viewer Sensitivity

The City of Tustin General Plan (2008) contains policies that illustrate the residents' values and expectations for their visual environment. For instance, the General Plan states that citywide visual linkages are important in establishing the community's identify. For the residents of Tustin, the pattern of landscape, buildings, sidewalks, lighting, and graphics are important urban design elements as they create an image which conveys the personality of the City of Tustin. The Land Use Element contains goals and policies to improve the visual urban design in the City of Tustin, including major freeways such as I-5 and SR-55. In addition, the Conservation/Open Space/Recreation

Element (COSR) conceptually identifies significant public scenic resources that should be preserved or improved upon through landscaping. The I-5 and SR-55 interchange, for example, is identified within the COSR as an area for "proposed freeway edge landscape buffering."

A list of the Land Use Element policies related to the proposed project is provided below:

Policy 5.8: Improve edge conditions and buffers between older residential neighborhoods and adjacent freeway edges and commercial and industrial uses.

Policy 6.1: Develop citywide visual and circulation linkages through strengthened landscaping, pedestrian lighting, bicycle trails (where feasible) and public identity graphics along major street corridors.

Policy 6.3: Improve the image of major highways through the use of pedestrian amenities, landscaping, lighting, graphics and/or other onsite and streetscape treatments.

Policy 7.5: (a) Focus retail development into consolidated, economically viable and attractive centers of adequate size and scale which offer a variety of retail goods and amenities; (b) reinforce quality highway and scenic development adjacent to the City's major transportation corridors; and (c) discourage typical strip commercial development.

### 5.4.2 City of Santa Ana Existing Viewer Sensitivity

The City of Santa Ana's General Plan (2010) also illustrates the residents' values and expectations for their visual environment, particularly for the City of Santa Ana's urban form. For example, the City of Santa Ana's recently adopted General Plan (2010) contains a Scenic Corridors Element that describes a number of major transportation systems (including I-5) and open space systems (including Santiago Creek) which are considered of regional significance because many residents form their image of the City of Santa Ana from their travels along these corridors. Again, according to the Scenic Corridors Element, the SR-55, I-5, and SR-22 freeways are designated as "high-speed scenic corridors" that operate on a regional scale. These freeways influence the City of Santa Ana's image; therefore, the Scenic Corridors Element calls for two types of high-speed scenic corridor treatment: buffer edges to screen unsightly or unnecessary views from the freeways; and design landscaped edges to promote selected views into the City of Santa Ana.

In addition, the City of Santa Ana's General Plan contains an Urban Design Element which provides a foundation for citywide development standards and design guidelines. The Urban Design Element contains goals and policies to promote the creation of an urban form that is both pleasing and functional. This Element identifies numerous districts, paths, landmarks, and gateways in the City of Santa Ana, many of which are

surrounding or found adjacent to the project site. A list of these features is provided below.

Santa Ana Urban Design Elements:

- *Districts:* Districts refer to those areas of the City of Santa Ana that have consistent design features with a strong context and interrelationship of activities. The following Districts are located adjacent to the project site: Northwest; North Main; Park Santiago; Cabrillo Park; Broadway; French Park; Intercity/Regional Transportation Center; Fourth Street Professional; and Metro East.

- *Paths*: Paths are the means by which people travel throughout the City of Santa Ana including freeways, streets, walkways, and bikeways. Distinct major paths found within and adjacent to the project site include First Street, Seventeenth Street, and Main Street.

- *Landmarks:* Landmarks are elements of the urban form containing design features that reinforce their uniqueness and memorability. Most of the existing landmarks in the City of Santa Ana are concentrated along I-5 and in the downtown area. The following landmarks are located adjacent to the project site: Main Place Mall/Main Street Concourse; City Water Tower; Regional Transportation Center; Birtcher Xerox Center; and Santa Ana Zoo.

- *Gateways:* Gateways are located at the City of Santa Ana's entry points and help to define boundaries and enhance the City's identity, while reinforcing a sense of place. The following gateways are located surrounding or immediately adjacent to the project site: Main Street at I-5; Seventeenth Street at I-5; Santa Ana Boulevard at I-5; Fourth Street at I-5; First Street at I-5; Lassan Rail Corridor; and Metro East.

A list of the Scenic Corridor and Urban Design programs and policies related to the proposed project are provided below:

Scenic Corridors Element Programs

- Screen unsightly uses which can be viewed from scenic corridors.

- Promote unique, image-enhancing freeway landscaping where highways pass through the City by providing continuing input to Caltrans landscape planning activities.

- Selectively landscape freeway corridor edges to screen undesirable scenes while promoting views of identifiable City features.

- Ensure that landscaping at freeway interchanges which correspond to major City entry points is more visually significant than is the case with other interchanges.

Urban Design Element Policies

Policy 2.1 Projects must acknowledge and improve upon their surroundings with the use of creative architectural design, streetscape treatments, and landscaping.

Policy 3.1 Landscaping will be promoted on freeway slopes, roadway medians, and parkways.

Policy 3.9 Maintain the open, natural and recreational features of Santiago Creek and the Santa Ana River, to enhance these amenities as a passive and active open space view corridor.

Policy 7.3 Freeway on and off ramps are expected to be landscaped in a manner to create a sense of place and arrival.

### 5.4.3 City of Orange Existing Viewer Sensitivity

The City of Orange's General Plan (2010) also contains policies that illustrate the residents' values and expectations for their visual environment. For instance, the Natural Resources Element of the General Plan includes policies to preserve the visual and aesthetic resources in the City of Orange. In addition, the Urban Design Element of the General Plan contains policies that address the arrangement, appearance, and functionality of the community. Specifically, the Urban Design Element focuses on place making and on those physical features which shape the setting for life in the City of Orange. This element addresses the design of buildings, groups of buildings, spaces and landscapes, and open space between buildings, and establishes the processes that make places successful and aesthetically appealing (*City of Orange General Plan*, pp. UD-1 – UD-2).

A list of the Land Use Element and Natural Resources Element policies related to the proposed project is provided below:

Land Use Element Policies

Policy 7.5: Work with and encourage other agencies and service providers to minimize potential visual and environmental impacts of their facilities on Orange.

Natural Resources Element Policies

Policy 7.3: Encourage the development of landscaped medians and parkway landscaping along arterial streets in public and private projects, and encourage the state to provide freeway landscaping.

## 5.5 EXISTING VIEWER GROUPS, VIEWER EXPOSURE, AND VIEWER AWARENESS

Two general viewer groups were considered for the evaluation of viewer response: those with views from the freeway and those with views to the freeway.

Viewers from the Freeway

This viewer group is comprised of the freeway user. For viewers traveling I-5 from SR-55 to SR-57, views are generally of short duration and consist primarily of urban buildings, such as office buildings, shopping centers, and houses, which can be seen above or through openings of the existing retaining and sound walls and adjacent to slopes landscaped with ornamental vegetation. Views of the Santa Ana Mountains can be seen to the east in the distance. The viewers along this segment of I-5 are primarily in motor vehicles and typically include tourists, local business owners and operators, work commuters, and private property owners.

The awareness of visual resources by these freeway users is anticipated to vary with their particular activity. Tourists typically have a high awareness of the visual resources around them, yet are expected to be less sensitive to specific changes in that environment. In general, freeway users in vehicles will experience the project site and surrounding area as a sequence of views and may not focus on specific roadway features. Local residents and business owners would be the most sensitive to visual issues due to their familiarity as well as their personal investment in the project site and surrounding area.

Viewers to the Freeway

This viewer group is comprised of all those who can see the proposed project or any of its components from off-site locations. In the case of the proposed project, the number of people with views to the project site is limited. Views of the proposed project are available from some commercial, public/institutional, and office buildings adjacent to the project site, as well as from access roads that intersect the freeway. However, long distance views of the project site are generally limited due to the undulating nature of I-5 and the existing soundwalls present for much of the length of the project corridor.

# 6.0 VISUAL IMPACT ASSESSMENT

## 6.1 METHOD OF ASSESSING PROJECT IMPACTS

The visual impacts of project alternatives were determined by assessing the visual resource change due to the project and predicting viewer response to that change. Visual resource change is the sum of the change in visual character and change in visual quality. The viewer response to project changes is the sum of viewer exposure and viewer sensitivity to the project as determined in the preceding section.

First, an assessment of the compatibility of the proposed project with the visual character of the existing landscape was conducted to determine the visual resource change. Next, a comparison of the visual quality of the existing resources with the project visual quality after construction was conducted. Specifically, a quantitative Visual Quality Evaluation (VQE) was conducted to assess the magnitude of the potential changes caused by the proposed project. The VQE compared the visual quality of both the existing and proposed conditions from each key view. A numerical rating between 1 and 7 was assigned for the existing quality from each key view, with 1 having the lowest value and 7 the highest value. View simulations were then prepared illustrating the likely appearance of each key view after project construction. Numerical ratings were then assigned to each of these proposed key views. The numerical difference, if any, between the existing and proposed conditions quantified the changes which may occur as a result of the proposed project. This numerical difference was compared to the expected sensitivities of potential viewer groups in order to determine a level of visual impact. The numerical rating system was based on the three criteria for evaluating visual quality (i.e., vividness, intactness, and unity), which were described previously in Section 5.1.

The overall resulting level of visual impact was determined by combining the severity of resource change with the degree to which people are likely to oppose the change.

## 6.2 DEFINITION OF VISUAL IMPACT LEVELS

**Low -** Minor adverse change to the existing visual resource, with low viewer response to change in the visual environment. May or may not require mitigation.

**Moderate -** Moderate adverse change to the visual resource with moderate viewer response. Impact can be mitigated within five years using conventional practices.

**Moderately High -** Moderate adverse visual resource change with high viewer response or high adverse visual resource change with moderate viewer response. Extraordinary mitigation practices may be required. Landscape treatment required will generally take longer than five years to mitigate.

**High -** A high level of adverse change to the resource or a high level of viewer response to visual change such that architectural design and landscape treatment cannot mitigate

the impacts. Viewer response level is high. An alternative project design may be required to avoid highly adverse impacts.

## 6.3 ANALYSIS OF KEY VIEWS

Because it is not feasible to analyze all the views in which the proposed project would be seen, it is necessary to select a number of key viewpoints that would most clearly illustrate the proposed project changes and the resulting visual effects. The key views selected represent the viewer groups as defined above that would potentially be affected by the project.

The location of these key views is shown in Figure 5.

**Key View 1**

*Orientation*

This view is from the Rancho Santiago Community College parking lot, looking north at I-5 freeway toward the Main Street HOV drop exit and entrance ramp.

*Existing Visual Quality/Character*

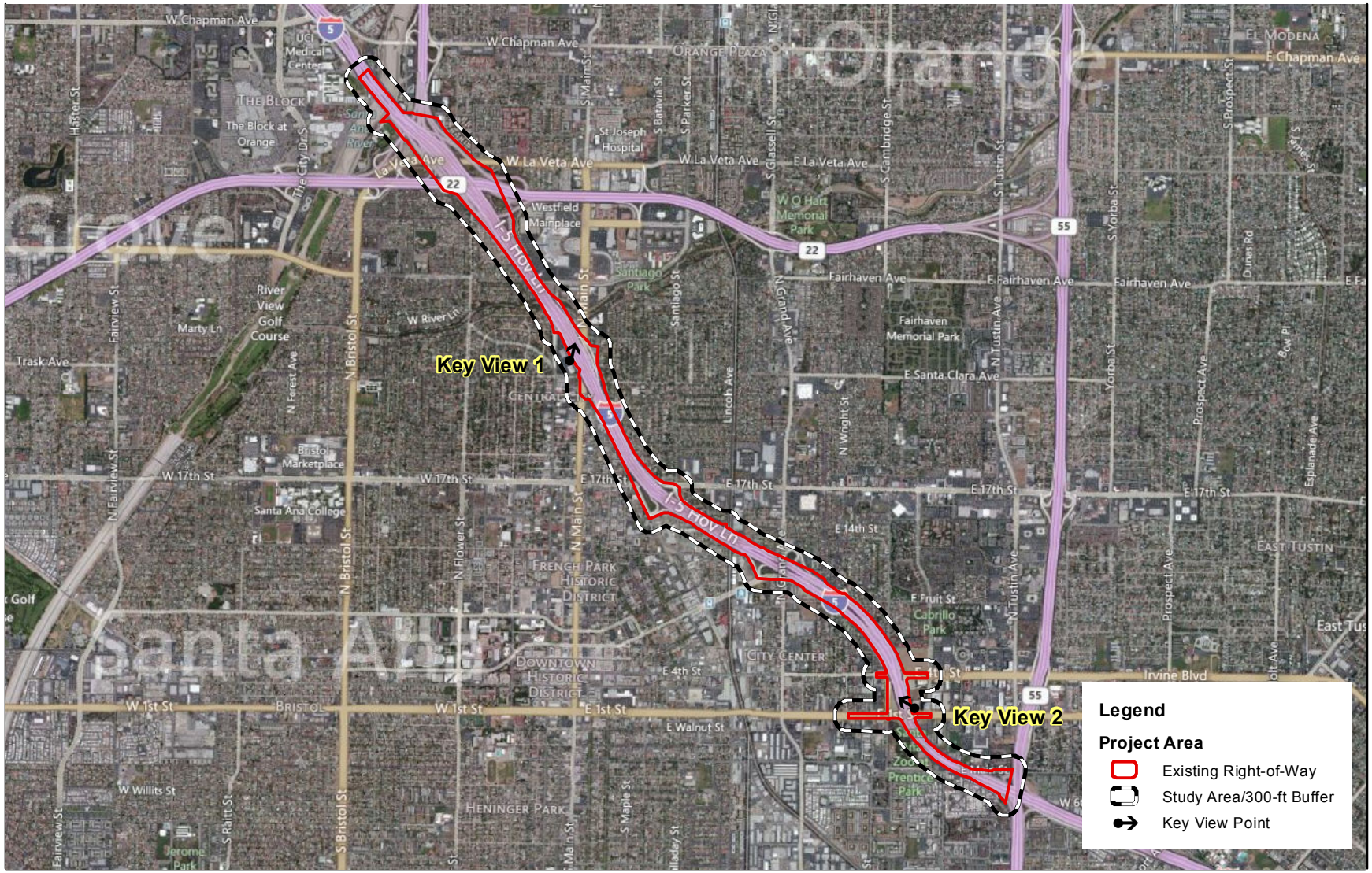
This view is representative of the views available from some public/institutional, commercial, and office buildings adjacent to the project site, as well as from access roads that intersect the freeway. The dominant feature in this view is I-5 freeway and Main Street HOV drop exit and entrance ramp. The existing character in this location is largely urban with limited ornamental landscaping visible beyond the Main Street HOV drop exit and entrance ramp on the far left and far right sides of the photo. The Discovery Center Museum (cube structure) is visible in the center background of this view and the OCTA office building is visible in the left-center background of this view. The vividness in this view is moderate largely due to the cube structure of the museum which offers a strong memorable feature in the landscape. The intactness and unity of this view are also moderate as the general landform and vegetative cover are visually consistent. Existing visual quality in this location is therefore moderate. Figure 6 depicts the Existing Key View 1.

*Proposed Project Features*

The proposed project proposes to remove the Main Street HOV drop exit and entrance ramp. Figure 6 depicts the proposed improvements for the Existing Key View 1 in a visual simulation.

*Change to Visual Quality/Character*

A numerical rating between 1 and 7 was assigned for the existing visual quality and proposed visual quality at Key View 1, as illustrated in Table 1 below. The numerical




Source: ESRI 2012; AECOM 2012

0 1,750 3,500 7,000 Feet

Scale: 1:42,000; 1 inch = 3,500 feet

**Figure 5**
**Key View Point Map**

**Existing Key View 1**

**Proposed Key View 1**

Source: AECOM

**Figure 6**
**Key View 1**

difference, if any, between the existing and proposed conditions quantifies the change which may occur as a result of the proposed project.

Table 1
Summary of Visual Quality Change to Key View 1[a]

| | Vividness | Intactness | Unity | Overall Visual Quality Rating[b] |
|---|---|---|---|---|
| Existing | 5.5 | 5.0 | 6.0 | 5.5 |
| Proposed | 6.0 | 5.0 | 6.0 | 5.7 |
| ***Visual Quality Difference[c]*** | | | | ***0.2*** |

Notes:
[a] A numerical rating was assigned for the existing and proposed quality from Key View 1, with 1 representing the lowest value and 7 representing the highest value.
[b] The overall visual quality rating is determined by taking the average of the vividness, intactness, and unity.
[c] The visual quality difference is determined by subtracting the difference between the existing overall visual quality rating and the proposed visual quality rating.

As illustrated in Figure 6 and in Table 1 above, the proposed removal of the Main Street HOV drop exit and entrance ramp would constitute a noticeable change that would not be adverse. The prominent built form associated with the HOV drop ramps structure would be removed allowing for uninterrupted views across I-5. With the elimination of the drop ramp, greater visibility of the Discovery Center Museum would be afforded, which would slightly enhance the vividness of this view. Additionally, the proposed improvements would be consistent with the existing urban/freeway visual character and would represent a minor change in the existing setting. These changes to the visual character and quality would be low.

*Viewer Response*

The proposed removal of the Main Street HOV drop exit and entrance ramp would be apparent from the commercial, public/institutional, and office buildings adjacent to the project site, as well as from access roads that intersect the freeway. This proposed improvement would also be visible to motorists traveling along the northbound and southbound sides of I-5 freeway.

However, sensitivity to this change in the visual environment would likely be low as this improvement is located within the freeway and would not represent an extreme change in the existing setting.

*Resulting Visual Impact*

As described above and illustrated in Table 1, the overall viewer response would be low, and the change in the visual quality and character would also be low. The resulting visual impact would therefore be low.

**Key View 2**

*Orientation*

This view is from the Xerox parking structure, looking northwest toward Fourth Street.

*Existing Visual Quality/Character*

This view is representative of the views available from some commercial and office buildings adjacent to the project site, as well as from access roads that intersect the freeway. The dominant features in this view are I-5 freeway, I-5 elevated HOV structure, and landscaped slope located parallel to the freeway. The elevated I-5 HOV structure and shrubs and trees along the slope adjacent to the freeway block most views beyond I-5 freeway. Through openings between the built features and gaps between the shrubs and trees, Mabury Street and adjacent vacant lot are visible at the top of the vegetated slope. Power poles and trees in between commercial buildings are also visible in the background of this view. The vividness in this view is moderate due to the well-maintained shrubs and trees along the slope adjacent to the freeway which create a distinctive visual pattern in this view. The intactness and unity are also moderate as the general landform and vegetative cover are visually consistent. Existing visual quality in this location is therefore moderate. Figure 7 depicts the Existing Key View 2.

*Proposed Project Features*

One of the proposed ramp modifications of the proposed project, Option A, would include closure of the existing I-5 SB entrance ramp at First Street and construction of a new entrance ramp at the Fourth Street interchange. The new entrance ramp is shown as a visual simulation on Figure 7.

This proposed ramp improvement would result in an approximately 825-foot increase of weaving length (1,550 feet to 2,375 feet) along SB I-5 between the Fourth Street entrance ramp and SR-55. The new Fourth Street entrance ramp would also include a California Highway Patrol (CHP) Enforcement area and small retaining wall.

*Change to Visual Quality/Character*

A numerical rating between 1 and 7 was assigned for the existing visual quality and proposed visual quality at Key View 2, as illustrated in Table 2 below. The numerical difference, if any, between the existing and proposed conditions quantifies the change which may occur as a result of the proposed project.

**Existing Key View 2**

**Proposed Key View 2**

Source: AECOM

**Figure 7**
**Key View 2**

Table 2
Summary of Visual Quality Change to Key View 2[a]

| | Vividness | Intactness | Unity | Overall Visual Quality Rating[b] |
|---|---|---|---|---|
| Existing | 3.5 | 4.0 | 4.0 | 3.8 |
| Proposed | 3.3 | 4.0 | 3.7 | 3.7 |
| ***Visual Quality Difference[c]*** | | | | ***0.1*** |

Notes:
[a] A numerical rating was assigned for the existing and proposed quality from Key View 2, with 1 representing the lowest value and 7 representing the highest value.
[b] The overall visual quality rating is determined by taking the average of the vividness, intactness, and unity.
[c] The visual quality difference is determined by subtracting the difference between the existing overall visual quality rating and the proposed visual quality rating.

As illustrated in Figure 7 and in Table 2 above, the proposed creation of the new Fourth Street entrance ramp in conjunction with the removal of some of the shrubs and trees on the slope would constitute a minor change. The slope would be re-landscaped following construction except where the paved entrance ramp, short retaining wall and CHP area (located to the right of the retaining wall) are proposed. It should be noted that a landscape plan will be prepared to detail the replacement planting, irrigation, and maintenance requirements as well as the wall aesthetics. These project elements would constitute a change to the immediate project ramp area which would slightly decrease the vividness and unity at this view; however, these changes would also be consistent with the existing urban/freeway setting and the change to the visual character and quality would be low.

*Viewer Response*

The proposed creation of the new Fourth Street entrance ramp in conjunction with the permanent removal of some of the shrubs and trees on the slope ramp would be apparent from the commercial and office buildings adjacent to the project site, as well as from access roads that intersect the freeway. This proposed improvement would also be visible to motorists traveling along the northbound and southbound sides of I-5 freeway.

However, sensitivity to this change in the visual environment would be low as this change represents a minor change in the existing setting. The proposed feature modifications, including the new SB I-5 on-ramp are all consistent with the existing visual attributes of I-5.

*Resulting Visual Impact*

As described above and illustrated in Table 2, the overall viewer response would be low, and the change in the visual quality and character would also be low. The resulting visual impact would therefore be low.

## 6.4 SUMMARY OF PROJECT IMPACTS

As described above, the project site has a moderate level of visual quality. The project site has undulating topography and a largely uniform urban setting. There are some strong memorable urban landscape features that are immediately adjacent to the project site, such as the City of Santa Ana Water Tower, which offers some vividness to a part of the surrounding area of the project site. Overall, the vividness of the landscape unit is moderate. The general landform and vegetative cover throughout the project site and surrounding area is ornamental in nature and these features are visually consistent with no unique visual features present. In addition, as stated above, most views along the east and west edges of I-5 between SR-55 and SR-57 are constrained by existing sound walls and ornamental vegetation. Thus, the intactness and unity of the landscape unit is moderate.

The only two areas where proposed changes may be more apparent to existing conditions are illustrated in Key Views 1 and 2 above. In Key View 1, the proposed removal of the Main Street HOV drop exit and entrance ramp would constitute a noticeable change that would not be adverse. With the elimination of the drop ramp more of the Discovery Center Museum would be visual from this view point. However, the proposed improvements would be consistent with the existing urban/freeway visual character and would represent a minor change in the existing setting. In addition, in Key View 2, the proposed creation of the new Fourth Street entrance ramp in conjunction with the removal of some of the shrubs and trees on the slope would constitute a minor change. The slope would be re-landscaped following construction except where the paved entrance ramp, short retaining wall and CHP area are located. These project elements would be consistent with the existing urban/freeway setting.

The proposed project would result in minimal changes to the existing visual character and visual quality of the project area. All proposed improvements would be constructed within Caltrans' existing ROW limits. In addition, temporary construction related activities (staging areas and easements) would also be located within Caltrans' ROW limits. The proposed improvements include the addition of one HOV lane in each direction on I-5 to provide additional HOV capacity and reduce congestion. In addition, modifications and improvements to the First and Fourth Street SB entrance ramps proposed to improve operations in the general purpose lanes. Views of these improvements would be limited primarily to the freeway users with some views available from surrounding office, institutional/public, and commercial buildings and access streets. These proposed improvements are consistent with the existing urban/freeway setting and represent minor changes in the existing views.

The overall viewer response in these two locations would be low, and the change in the visual quality and character would also be low. The proposed project would be consistent with the policies that illustrate the surrounding residents' values and expectations for their visual environment in the cities of Tustin, Santa Ana, and Orange.

## 6.5 CUMULATIVE IMPACTS

As described above, the proposed project will result in minor visual impacts. The proposed removal of the Main Street HOV drop exit and entrance ramp would constitute a noticeable change that would not be adverse. In addition, the proposed closure of the First Street entrance ramp and introduction of the new Fourth Street entrance ramp in conjunction with limited modifications to existing ornamental vegetation would constitute a minor change. The overall viewer sensitivity and response to the proposed project would be low. Therefore, the proposed project's potential contribution to cumulative impacts would not occur and no cumulative considerable effects would result.

## 7.0 VISUAL MINIMIZATION/MITIGATION

The proposed project results in minor changes to the visual environment. The change in visual quality and character is low. The overall viewer response to the visual change is moderate to high because of the local values of the community as identified in this study. As a result, there needs to be a landscape plan to show a replacement planting with a complimentary ornamental landscape. Additionally, there needs to be architectural treatments identification in the project plans for any walls for visual consistency to ensure aesthetic compatibility with the surrounding visual environment of the project area. The landscape plan and wall aesthetic treatments require the review and the approval of the Caltrans District 12 Landscape Architect in consultation with the Caltrans District 12 Maintenance Department.

## 8.0 REFERENCES

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