FINAL

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION

FAIRVIEW BRIDGE REPLACEMENT AND STREET IMPROVEMENTS (9TH STREET TO 16TH STREET) PROJECT

SANTA ANA, ORANGE COUNTY, CALIFORNIA

LSA

June 2020

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FAIRVIEW BRIDGE REPLACEMENT AND STREET IMPROVEMENTS (9TH STREET TO 16TH STREET) PROJECT

SANTA ANA, ORANGE COUNTY, CALIFORNIA

Submitted to:

Santa Ana Public Works Agency
20 Civic Center Plaza
Santa Ana, California 92701

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LSA Project No. WKE1702

LSA

June 2020

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LIST OF ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AB	Assembly Bill
ac	acre/acres
ACM	asbestos-containing material
ACS	American Community Survey
af	acre-feet
amsl	above mean sea level
APE	Area of Potential Effects
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
ASR	Archeological Survey Report
Basin	South Coast Air Basin
Basin 8-1	Coastal Plain of Orange County Groundwater Basin
Basin Plan	Santa Ana Regional Water Quality Control Board's Water Quality Control Plan
BMP	Best Management Practice
BSA	Biological Study Area
C2	General Commercial
CAAQS	California Ambient Air Quality Standards
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CGP	Construction General Permit
CH_4	methane

City	City of Santa Ana
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
ft	foot/feet
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GC	General Commercial
GCC	global climate change
GGUSD	Garden Grove Unified School District
GHG	greenhouse gas
GSA	Groundwater Sustainability Agency
GSP	groundwater sustainability plan
HA	Hydrologic Area
HCM	Highway Capacity Manual
HCP	Habitat Conservation Plan
HFC	hydrofluorocarbons
HPSR	Historical Property Survey Report
HRER	Historical Resources Evaluation Report
HRI	Historic Resources Inventory

HSA	Hydrologic Subarea
HU	Hydrologic Unit
ICU	intersection capacity utilization
in/sec	inches per second
ISA	Initial Site Assessment
IS/MND	Initial Study/Mitigated Negative Declaration
LACM	Natural History Museum of Los Angeles County
lbs/day	pounds per day
LED	light-emitting diode
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
LID	Low Impact Development
L_{max}	maximum instantaneous noise level
LOS	level of service
LR-7	Low-Density Residential
mi	mile/miles
MLD	Most Likely Descendant
MPAH	Master Plan of Arterial Highways
mph	miles per hour
MRZ	Mineral Resource Zone
MT	metric ton
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NADR	Noise Abatement Decision Report
NAHC	Native American Heritage Commission
NALMA	North American Land Mammal Age
NB	noise barrier
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NES	Natural Environment Study

NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
NOI	Notice of Intent
NOT	Notice of Termination
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	Noise Study Report
O	Open Space Land
O_3	ozone
OC	Orange County
OCFA	Orange County Fire Authority
OCTAM	Orange County Transportation Analysis Model
OHWM	ordinary high water mark
OPR	Office of Planning and Research
OS	Open Space
PCB	polychlorinated biphenyl
PFC	perfluorocarbons
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
PRDs	Permit Registration Documents
Project	Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project
R1	Single-Family Residence
R2	Two-Family Residence
REC	Recognized Environmental Condition
R factor	Revised Universal Soil Loss Equation
RMS	root-mean-square

ROG	reactive organic gases
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
SART	Santa Ana River Trail
SAUSD	Santa Ana Unified School District
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
sf	square feet
SF_6	sulfur hexafluoride
SGMA	Sustainable Groundwater Management Act
SMARA	Surface Mining and Reclamation Act
SMARTS	Storm Water Multiple Application and Report Tracking System
SO_2	sulfur dioxide
sq mi	square miles
SR	State Route
State	State of California
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TIA	Traffic Impact Analysis
TMN 2.5	Traffic Noise Model Version 2.5
TMP	Traffic Management Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VdB	vibration velocity decibels
VHFHSZ	Very High Fire Hazard Severity Zone
VMT	vehicle miles traveled
WDID	Waste Discharge Identification Number
WQMP	Water Quality Management Plan

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1.0 PROJECT INFORMATION

This chapter describes the proposed Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project (project) that is evaluated in this Initial Study/Mitigated Negative Declaration (IS/MND). Copies of all materials referenced in this IS/MND are available for review in the project file during regular business hours at the City of Santa Ana Public Works Agency. The IS/MND was released for public review and comment by the City of Santa Ana (City) from April 6, 2020 through May 12, 2020. Comments received on the IS/MND during this public review period are provided in Appendix F and comment responses are provided in Appendix G.

1. **Project Title:**

   Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

2. **Lead Agency Name and Address:**

   City of Santa Ana
   Public Works Agency
   20 Civic Center Plaza
   Santa Ana, California 92701

3. **Contact Person and Phone Number:**

   Kenny Nguyen, P.E.
   Senior Civil Engineer
   20 Civic Center Plaza
   Santa Ana, California 92701
   Phone: (714) 647-5632

4. **Project Location:**

   The Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project (Project) is located in the northwestern portion of Santa Ana in Orange County.

5. **Project Sponsor's Name and Address:**

   City of Santa Ana
   Public Works Agency
   20 Civic Center Plaza
   Santa Ana, California 92701

6. **General Plan Designation:**

   The City of Santa Ana (City) General Plan Circulation Element designates Fairview Street as a six-lane Major Arterial. The adjacent land uses are designated Low-Density Residential (LR-7), Open Space (OS), and General Commercial (GC).

7. **Zoning:**

   The Project site is a public street, and the adjacent land uses are zoned Single-Family Residence (R1), Two-Family Residence (R2), Open Space Land (O), and General Commercial (C2).

8. Description of Project:

The following describes the proposed Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project (Project) that is the subject of this Initial Study/Mitigated Negative Declaration (IS/MND) prepared pursuant to the California Environmental Quality Act (CEQA). The purpose of this IS/MND is to evaluate whether the proposed Project would result in any potential significant environmental effects.

Project Purpose and Need. Fairview Street consists of a north/south major arterial located in the northwestern portion the City. South of 9th Street, Fairview Street provides three lanes in each direction that are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic “bottleneck” during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

Additionally, the existing Fairview Street bridge has insufficient safety barriers and capacity to handle existing and projected traffic levels in the Project Area and is operating with the following deficiencies within the Project limits:

- No sidewalks, bike lanes, center median or barrier, or lighting; and
- Congestion on and around the existing bridge due to high traffic demands and a limited number of lanes relative to areas north and south of the bridge.

The purpose of the proposed Project is to improve pedestrian/bicyclist safety and traffic flow on and in the vicinity of Fairview Street bridge. The following goals/objectives have been identified for the proposed Project:

- Make the Fairview Street bridge design and capacity consistent with the Orange County Master Plan of Arterial Highways and the City of Santa Ana General Plan Circulation Element; and
- Provide for adequate vehicular capacity and greater pedestrian and bike safety on Fairview Street bridge.

As described below, the proposed Project would improve traffic flow and alleviate congestion in the study area. The proposed Project would also increase pedestrian safety at Fairview Street bridge by constructing new barrier rails, sidewalks, bicycle lanes, a raised median, and lighting on the proposed bridge structure.

Project Description. The proposed Project includes replacing the Fairview Street bridge over the Santa Ana River and widening Fairview Street between 9th Street and 16th Street. The proposed Project would widen Fairview Street from two lanes in each direction to three lanes in each direction in Santa Ana (refer to Figures 1 and 2). The Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

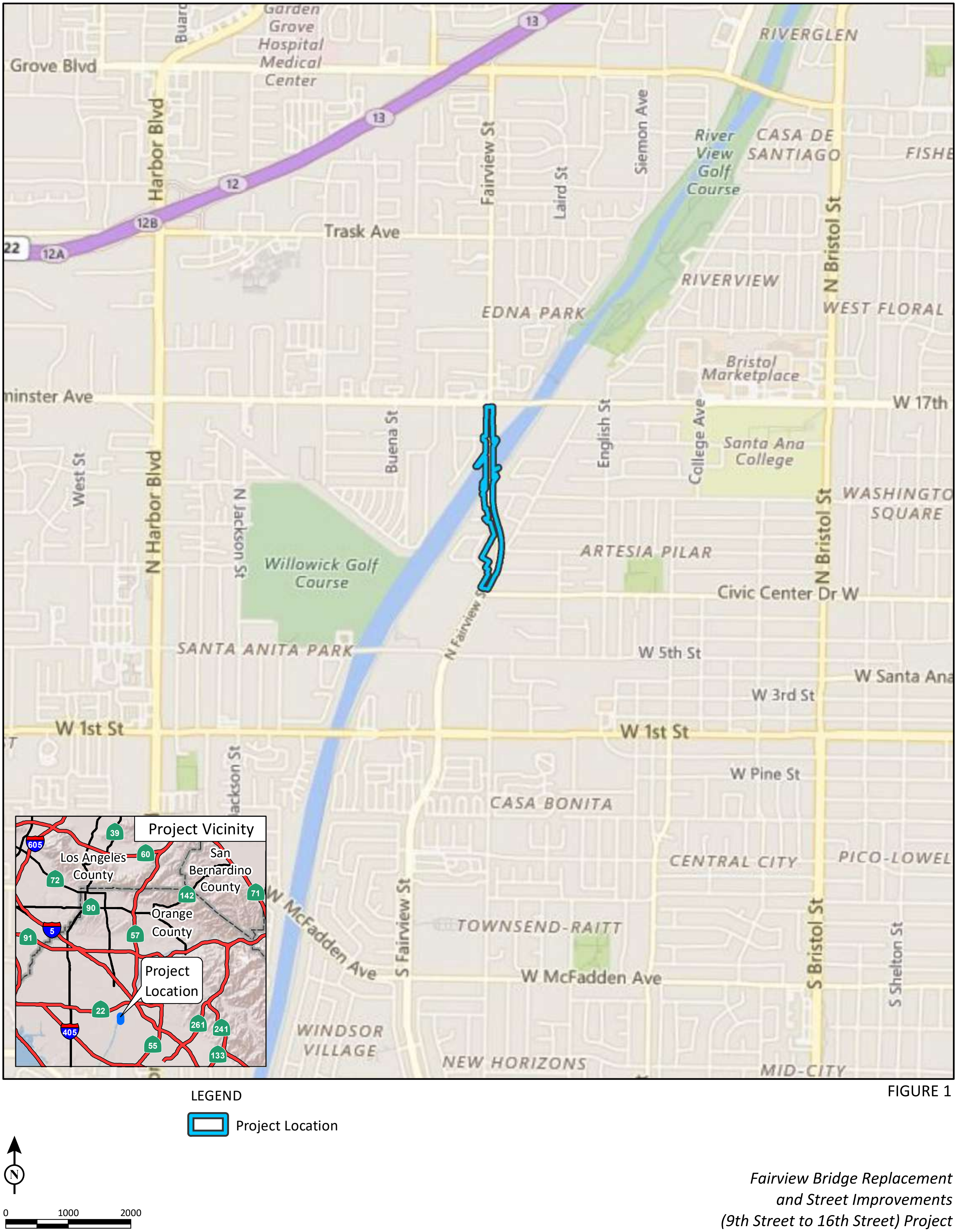

FIGURE 1

SOURCE: Bing (2015)

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Project Location

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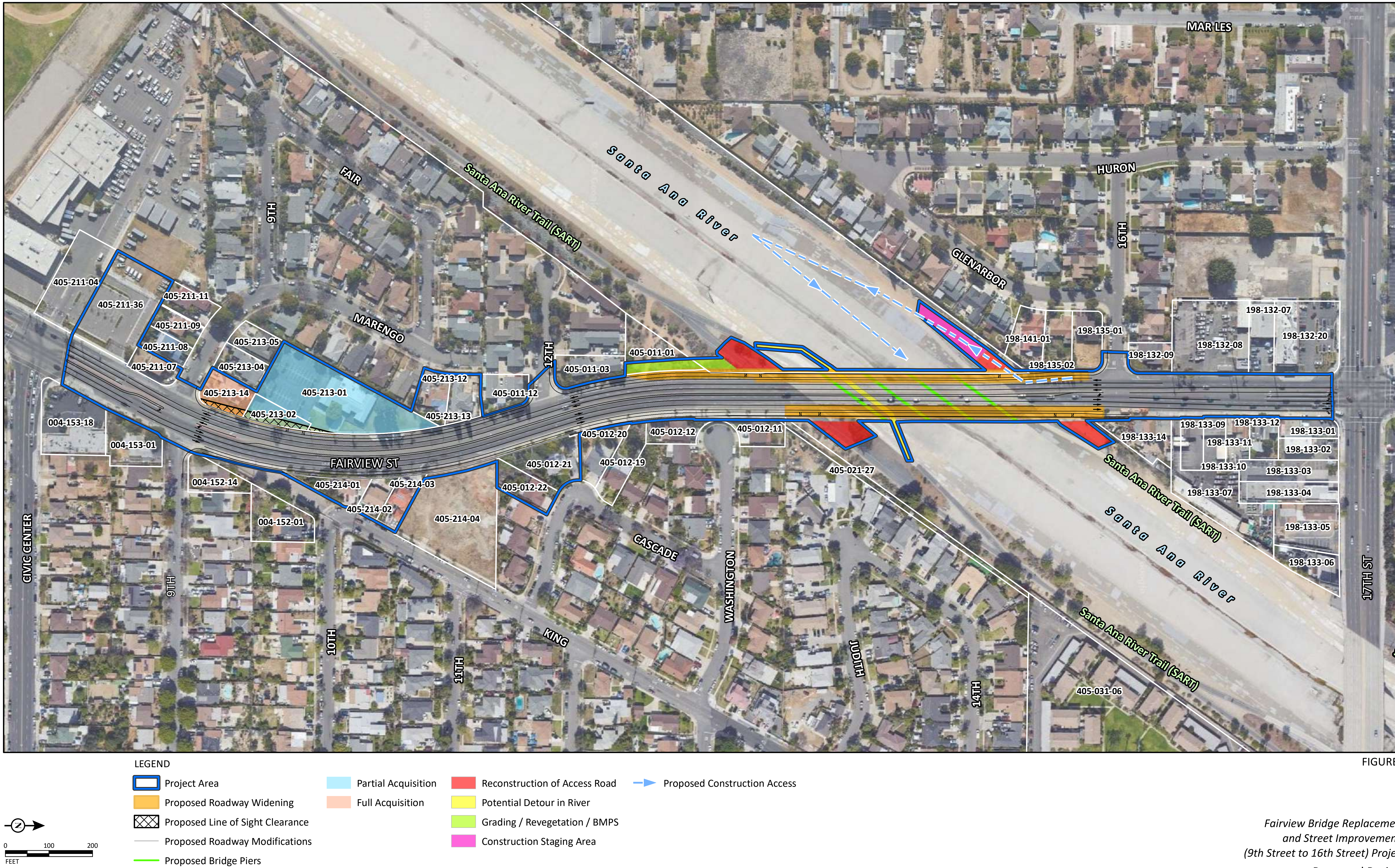

SOURCE: WKE (3/2018); Google (2016)

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FIGURE 2

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Proposed Project

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The proposed bridge would be expanded from approximately 52 feet (ft) to 100 ft in width and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

The proposed Project would include partial right-of-way acquisition from two parcels (two commercial parcels [Assessor's Parcel Numbers (APNs) 405-213-02 and 405-213-01]). The proposed Project would require one full residential acquisition (a multi-family residence; APN 405-213-14), as shown in Figure 2. Full acquisition of the residential property would be required, as the proposed road widening would result in the loss of a portion of the side yard and a corner of the structure.

Property acquisition is required to provide adequate line of sight (safe viewing distance) for vehicles turning onto Fairview Street from 9th Street. View obstructions taller than 2.5 ft (such as a property wall) would be removed to maintain line of sight. Access to all properties would be maintained during construction. The two commercial parcels with partial acquisitions would not require relocation or disruption to the current function of those properties.

An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. These utilities would be temporarily relocated during construction and then permanently relocated to the new bridge. In addition, there is the potential for relocation of one or more utility poles along the Project alignment.

Water quality best management practices (BMPs) would be included to treat storm water runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bicyclists would be detoured away from the Fairview Street bridge to the 17th Street bridge to cross the Santa Ana River by way of the Santa Ana River Trail (SART) between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists wishing to cross the Santa Ana River would be detoured to adjacent Santa Ana streets such as King Street.

Construction of the proposed Project would require temporary closures of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of the SART affected by Project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured, and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street (refer to Figures 3a and 3b for the detour plans). There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detour are being coordinated with Orange County (OC) Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the riverbed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the riverbed as shown on Figure 2.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the Project area (Figure 2). All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to preconstruction conditions or better prior to Project completion.

9. Surrounding Land Uses and Setting:

The Fairview Street bridge spans the Santa Ana River. The SART (Class I bikeway; i.e., an off-street bikeway) runs on the east side of the Santa Ana River. In addition, Fairview Street is surrounded by a variety of land uses, including single-family and multifamily residences, parks, restaurants, commercial uses, light industrial uses, and vacant lands.

10. Other Public Agencies Whose Approval Is Required (e.g., permits, financial approval, or participation agreements):

Approvals from the following agencies are required for the proposed Project:

- California Department of Transportation (Caltrans) Local Assistance Division: Roadway and Bridge Plans, National Environmental Policy Act (NEPA) compliance for use of federal funding, E-76 approval, and right-of-way certification

- United States Army Corps of Engineers (USACE): Compliance with the Nationwide Permit Program under Section 404 of the Clean Water Act and Section 408 (Section 14 of the Rivers and Harbors Act of 1899, 33 USC 408)

- California Department of Fish and Wildlife (CDFW): Streambed Alteration Agreement under Section 1602 of the Fish and Game Code

- Santa Ana Regional Water Quality Control Board (RWQCB): Water Quality Certification under Section 401 of the Clean Water Act

- Orange County Flood Control District: Encroachment permits

- Orange County: Easement

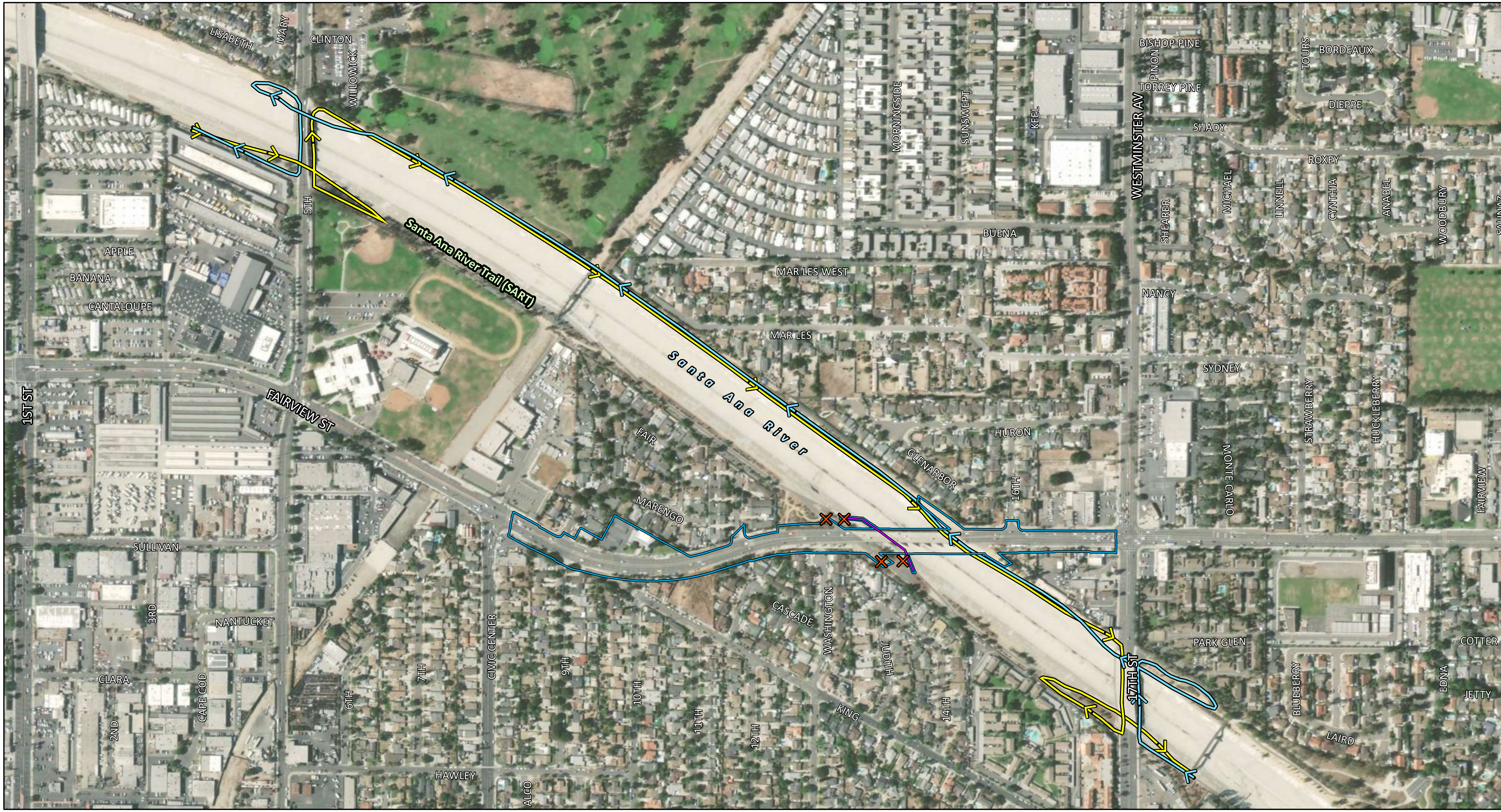

FIGURE 3A

LEGEND

- Project Area
- NB Trail Detour
- SB Trail Detour
- Potential Detour in River
- Trail Closure

0 225 450
FEET

SOURCE: WKE (3/2018); Google (2016)

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Detour for Eastern Trail Closure

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LEGEND

- Project Area
- NB Detour
- SB Detour
- Potential Detour in River
- Trail Closure

0 225 450
FEET

SOURCE: WKE (3/2018); Google (2016)

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FIGURE 3B

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Detour for Western Trail Closure

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11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code (PRC) section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

California Native American tribes traditionally and culturally affiliated with the Project site and area were notified of the proposed Project on April 11, 2018. No tribes requested consultation pursuant to PRC Section 21080.3.1; therefore, the City has fulfilled its obligations pursuant to Assembly Bill (AB) 52.

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2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist in Chapter 3.0.

☐ Aesthetics	☐ Agriculture/Forestry Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology/Soils	☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☐ Noise	☐ Population/Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities/Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

2.1 DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed Project MAY have a "Potentially Significant Impact" or "Potentially Significant Unless Mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Kenny Nguyen, P.E., Senior Civil Engineer

Date 4/1/20

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3.0 CEQA ENVIRONMENTAL CHECKLIST

3.1 AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐

3.1.1 Existing Setting

The Project area is characterized by suburban development and is surrounded by residential, commercial, and recreational uses. The current City of Santa Ana (City) General Plan Scenic Corridors Element designates Fairview Street as a secondary City entries corridor. The City's General Plan defines secondary corridors as corridors provide "stitching" to link neighborhoods, District Centers, and Mixed Use Corridors together. Their continuity is interrupted by the primary corridors; these intersection points should be used to give the traveler a sense of entering major activity centers.

The California Department of Transportation (Caltrans) Landscape Architecture Program administers the Scenic Highway Program, contained in the State Streets and Highways Code, Sections 260–263. State highways are classified as either Eligible for Scenic Designation, Officially Designated, or Connecting Federal Highway. Within Orange County, there is one Officially Designated State Scenic Highway (State Route 91 [SR-91]) and four Eligible State Scenic Highways (SR-1, SR-57, SR-74, and SR-91).[1]

3.1.2 Impact Analysis

a. Would the project have a substantial adverse effect on a scenic vista?

No Impact. Scenic vistas can generally be defined as natural landscapes that form views of unique flora, geologic, or other natural features that are generally free from urban intrusions. Typical scenic

1 California Department of Transportation. 2011. *California Scenic Highway Mapping System, Orange County*. Website: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed August 2019).

vistas include views of mountains and hills, large, uninterrupted open spaces, and waterbodies. Although the Fairview Street bridge crosses the Santa Ana River, this portion of the river is engineered and concrete-lined and does not contain vegetation. The Project area is not designated as a scenic vista by the City.

As identified above, Fairview Street is designed in the City's General Plan as a secondary City entries corridor. Although construction and operation of the proposed Project would result in a change in the visual environment, this change would be minimal because the proposed improvements would connect with the existing circulation system and would be similar to existing conditions. In addition, the proposed Project would replace the existing bridge structure with a new bridge of similar size and scale that would not block any of the existing views in the vicinity of the Project area. Therefore, the proposed Project would not substantially block or disrupt any views to scenic vistas compared to existing conditions. Therefore, there would be no impact to scenic vistas, and no mitigation is required.

b. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. Scenic resources are isolated occurrences of aesthetically pleasing natural or human-made forms. Although the Fairview Street bridge crosses the Santa Ana River, this portion of the river is engineered and concrete-lined and does not contain vegetation. Views of the Santa Ana River are accessible from the existing Fairview Street bridge and from the Santa Ana River Trail (SART). The replacement of the existing Fairview Street bridge over the Santa Ana River would not create a change in the existing nature and magnitude of the SART, and would not block any of the existing views of the Santa Ana River.

The nearest scenic highways to the Project area include SR-1, located approximately 8 miles (mi) west of the Project, designated as a State Highway Eligible for State Scenic Highway, and SR-91, located approximately 8 mi northeast of the Project, designated as an Officially Designated State Scenic Highway. The Project area is not visible from either scenic highway as classified by the Caltrans Scenic Highway Program in Orange County. Therefore, the proposed Project does not have the potential to damage scenic resources from designated scenic highways. There would be no impact to scenic resources or historic buildings within a designated State Scenic Highway. No mitigation is required.

c. In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact. The Project area is located in an urban area and is surrounded by residential, commercial, and recreational uses. The visual character immediately surrounding the Project area is representative of a built-out urban area containing a mix of residential, commercial, and open space uses. Implementation of the proposed Project would result in a minimal change in the existing visual environment because the proposed improvements would connect with the existing circulation system and would be similar to existing conditions. In addition, the proposed Project would replace the existing bridge structure with a new bridge of similar size and scale that would not block any of the existing views in the vicinity of the Project area. The proposed Project would also include a concrete barrier rail that would be integrated with the sidewalk on the bridge. Pedestrian-scale lights would be mounted on the concrete barrier rail on the bridge. The concrete barrier rail and street lights would be analyzed and determined during final design; however the proposed barrier rail and lights would be compatible with the existing character of the neighborhood and would be similar in concept to the First Street bridge over the Santa Ana River. The proposed materials and design of the proposed Project improvements would be consistent with the existing visual environment. In addition, the proposed Project is consistent with current zoning and applicable development standards, and with the General Plan Land Use designation and applicable General Plan policies. No impacts would occur, and no mitigation is required.

d. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant with Mitigation Incorporated. Fairview Street currently includes street lighting; however, the existing bridge structure does not have any street lighting. The proposed Project would include street lighting to improve safety on the bridge. As identified above, the proposed Project would also include a concrete barrier rail that would be integrated with the sidewalk on the bridge and would include mounted pedestrian-scale lights. These fixtures would be analyzed and determined during final design; however the proposed barrier rail and street lights would be compatible with the existing character of the neighborhood and would be similar in concept to the First Street bridge over the Santa Ana River. In addition, proposed street lighting would be typical of pole-mounted street lights used for bridges in the City, with lighting directed onto the roadway. The bridge would not include any reflective components that could increase glare. With implementation of Mitigation Measure AES-1, proposed street lighting would not result in excess illumination and light spillover to the Santa Ana River. Therefore, the proposed Project's potential light and glare impacts on daytime or nighttime views in the Project area would be less than significant with mitigation.

3.1.3 Mitigation Measures

Mitigation Measure AES-1	**Street Lighting.** Low-light level, energy-efficient, and directed illumination, and separate pedestrian-scale lighting integrated with aesthetically enhanced bridge barrier shall be specified in the design and construction of the proposed Project.

3.2 AGRICULTURE AND FORESTRY RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

3.2.1 Existing Setting

Maps of designated farmlands are compiled by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP), pursuant to the provisions of Section 65570 of the California Government Code. These maps use data from the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey and current land use information utilizing eight mapping categories, and represent an inventory of agricultural resources within the State. The maps depict currently urbanized lands and a qualitative sequence of agricultural designations. Maps and statistics are produced biannually using a process that integrates aerial photo interpretation, field mapping, a computerized mapping system, and public review. Orange County FMMP maps were reviewed to determine the potential for impacts to farmland as a result of the proposed Project.

3.2.2 Impact Analysis

a. Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The Project area is classified as Urban and Built-Up Land, according to the FMMP.[2] The Project area is not located on land that is designated as Prime Farmland or Farmland of Statewide

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2 California Department of Conservation. 2014. *Orange County Important Farmland 2014*. Website: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2014/ora14.pdf (accessed August 2019).

Importance. Therefore, implementation of the proposed Project would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the Orange County Important Farmland Map, to a nonagricultural use. The proposed Project would not convert any farmland to a nonagricultural use. Therefore, there would be no impact, and no mitigation is required.

b. Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The Project area consists of low-density residential, open space, and general commercial land uses as designated by the City General Plan Land Use Element.[3] There are no agricultural uses on or in the vicinity of the Project area. In addition, the Project area is not enrolled in a Williamson Act contract.[4] Therefore, the proposed Project would not conflict with any zoning for agricultural uses or any Williamson Act contract, and no impacts would occur. No mitigation is required.

c. Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

No Impact. As stated above, the Project area consists of low-density residential, open space, and general commercial land uses. The Santa Ana River, which runs directly underneath the Fairview Street bridge, is zoned for open space use. As stated above, no land on or in the vicinity of the Project area is zoned for agricultural uses. There are no existing agricultural or farmland operations on the Project site or in the surrounding area. Therefore, the proposed Project would not conflict with existing zoning for forest land or timberland, and no impacts would occur. No mitigation is required.

d. Would the project result in the loss of forest land or conversion of forestland to non-forest use?

No Impact. As stated above, no land on or in the vicinity of the Project area is zoned for forest land. Therefore, the proposed Project would not result in the loss of forest land or the conversion of forest land to nonforest use, and no impacts would occur. No mitigation is required.

e. Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. As stated above, no land on or in the vicinity of the Project site is zoned for agricultural or forest land. The proposed Project would not include other changes in the existing environment that would result in conversion of farmland to nonagricultural use, or forest land to nonforest use. Therefore, no impacts would occur. No mitigation is required.

[3] City of Santa Ana. 1998b. *City of Santa Ana General Plan Land Use Element.* February 2.

[4] California Department of Conservation. 2014. op. cit.

3.3 AIR QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

3.3.1 Existing Setting

The following section is based on air quality modeling and analysis conducted by LSA. The air quality modeling worksheets are provided in Appendix B.

The Project area is located within Santa Ana, which is part of the South Coast Air Basin (Basin). The Basin includes all of Orange County and portions of Los Angeles, Riverside, and San Bernardino Counties. Air quality within the Basin is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD adopted the 2016 Air Quality Management Plan (AQMP) in March 2017.[5]

The main purpose of an AQMP is to describe air pollution control strategies that will bring the area into attainment in a timely manner. A nonattainment area is considered to have worse air quality than the National Ambient Air Quality Standards (NAAQS) and/or the California Ambient Air Quality Standards (CAAQS), as defined in the federal Clean Air Act. The Basin is in nonattainment for the federal and State standards for ozone (O_3) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). In addition, the Basin is in nonattainment for the State particulate matter less than 10 microns in diameter (PM_{10}) standard, and in attainment/maintenance for the federal PM_{10} and carbon monoxide (CO) standards.

For transportation-related projects, the most effective way to reduce air pollution impacts is to reduce emissions from mobile sources, the principal contributor to the air basin. The 2016 AQMP also includes transportation control measures developed by the Southern California Association of Governments (SCAG) from the 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The 2016–2040 RTP/SCS includes chapters on the challenges in a changing region, creating a plan for our future, and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and State requirements placed on SCAG. Local

5 South Coast Air Quality Management District. 2016. *Final 2016 Air Quality Management Plan*. March.

governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under the California Environmental Quality Act (CEQA).

3.3.2 Impact Analysis

a. Would the project conflict with or obstruct implementation of the applicable air quality plan?

No Impact. Consistency with the 2016 AQMP for the Basin would be achieved if a project is consistent with the goals, objectives, and assumptions in the respective plan to achieve the federal and State air quality standards. Per the SCAQMD California Environmental Quality Act Air Quality Handbook,[6] there are two main indicators of a project's consistency with the applicable AQMP: (1) whether the project would increase the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the 2016 AQMP; and (2) whether the project would exceed the 2016 AQMP's assumptions for 2030 or yearly increments based on the year of project buildout and phasing.

For the proposed Project to be consistent with the AQMP, the project should be listed in the RTP/SCS. The proposed Project is listed in the financially constrained list of projects in the 2016 RTP/SCS under RTP ID: 2A0704 and listed in the Federal Transportation Improvement Program (FTIP) under ID# ORA170007. The 2017 FTIP Consistency Amendment 17-18 was approved by SCAG on February 23, 2018, and by the Federal Transit Administration (FTA)/Federal Highway Administration (FHWA) on March 26, 2018. The design concept and scope of the proposed Project is consistent with the project description in the 2016 RTP and 2017 FTIP and the "open to traffic" assumptions of SCAG's regional emissions analysis. Therefore, the proposed Project would not conflict with or obstruct implementation of the AQMP, and no impacts would occur.

b. Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant with Mitigation Incorporated. The SCAQMD is currently designated as nonattainment for the federal and State standards for O_3 and $PM_{2.5}$. In addition, the Basin is in nonattainment for the State PM_{10} standard. The SCAQMD's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

6 South Coast Air Quality Management District. 1993. CEQA Air Quality Handbook. Website: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/ceqa-air-quality-handbook-(1993) (accessed June 2019).

In developing thresholds of significance for air pollutants, the SCAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts is unnecessary. The following analysis assesses the potential project-level air quality impacts associated with construction and operation of the proposed Project.

The SCAQMD used the NAAQS/CAAQS emission concentrations as a guide to establish the CEQA project-level thresholds for reactive organic gases (ROG), oxides of nitrogen (NO_X), CO, sulfur dioxide (SO_2), PM_{10}, and $PM_{2.5}$. The SCAQMD has established thresholds of significance for criteria pollutant emissions generated during both construction and operation of projects as shown in Table 3.3.A below.

Table 3.3.A: SCAQMD Construction and Operation Thresholds of Significance (lbs/day)

	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Thresholds	75	100	550	150	150	55
Operation Thresholds	55	55	550	150	150	55

Source: SCAQMD (1993).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District
SO_2 = sulfur dioxide

The following sections describe the proposed Project's construction- and operation-related air quality impacts.

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, ROG, directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs; e.g., diesel exhaust particulate matter).

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, and paving roadway surfaces. Construction-related effects on air quality from most roadway 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 CO, NO_X, ROG, PM_{10}, and $PM_{2.5}$. 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 drying. 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 also depend on soil moisture, the silt content of soil, wind speed, and the amount of equipment operating at the time. Larger dust particles would settle near the source, while finer 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, NO_X, ROG, 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. Areas within 500 feet (ft) of California Air Resource Board (CARB) defined sensitive land uses would be labeled 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. Off-road diesel fuel meeting federal standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under State law and CARB 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 construction emissions were estimated for the proposed Project using the Sacramento Metropolitan Air Quality Management District's Road Construction Emissions Model, Version 9.0.0, which is consistent with the guidance provided by the SCAQMD for evaluating construction impacts from roadway projects. The maximum amount of construction-related emissions during a peak construction day is presented in Table 3.3.B. The PM_{10} and $PM_{2.5}$ emissions assume a 50 percent control of fugitive dust as a result of watering and associated dust-control measures.[7] The Project construction emissions presented below are based on the best information available at the time of calculations and specify that the schedule for Project construction is anticipated to take approximately 2 years.

As shown in Table 3.3.B, with the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., a minimum of twice per day), construction emissions associated with the proposed Project would be less than significant for ROG, CO, PM_{10}, and $PM_{2.5}$ emissions; however, NO_x emissions would exceed the SCAQMD threshold, resulting in a potentially significant impact. Additional emission reduction methods such as applying water or a dust palliative, a dust control plan, track-out reduction measures, equipment maintenance, spill control, and reducing vehicle idling are necessary to avoid substantial criteria pollutant impacts. Mitigation Measure AQ-1 includes these emission reduction methods and an additional measure to require cleaner engines. Table 3.3.C shows the proposed Project's mitigated construction emissions.

7 South Coast Air Quality Management District. 2007. *Fugitive Dust Mitigation Measure Tables. Table XI-A: Construction & Demolition*. Website: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mitigation-measures-and-control-efficiencies/fugitive-dust (accessed November 2019).

Table 3.3.B: Maximum Daily Project Construction Emissions without Mitigation

Project Phase	ROG	CO	NO_X	Total PM_{10}	Total $PM_{2.5}$
Grubbing/Land Clearing (lbs/day)	2.47	20.23	28.14	8.71	1.67
Grading/Excavation (lbs/day)	17.10	125.59	198.35	15.98	8.52
Drainage/Utilities/Subgrading (lbs/day)	10.86	85.86	118.05	12.81	5.55
Paving (lbs/day)	2.89	31.02	29.87	1.73	1.64
Maximum (lbs/day)	**17.10**	**125.59**	**198.35**	**15.98**	**8.52**
SCAQMD Threshold (maximum lbs/day)	**75.0**	**550.0**	**100.0**	**150.0**	**55.0**
Exceeds?	**No**	**No**	**Yes**	**No**	**No**

Source: Sacramento Metropolitan Air Quality Management District *Road Construction Emissions Model* (May 2018), compiled by LSA (July 2018).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District

Table 3.3.C: Maximum Daily Project Construction Emissions with Mitigation

Project Phase	ROG	CO	NO_X	Total PM_{10}	Total $PM_{2.5}$
Grubbing/Land Clearing (lbs/day)	1.39	26.74	4.94	7.76	1.77
Grading/Excavation (lbs/day)	7.94	150.72	17.92	8.54	2.41
Drainage/Utilities/Subgrading (lbs/day)	4.96	95.18	12.94	8.23	2.16
Paving (lbs/day)	1.82	35.13	9.10	0.42	0.32
Maximum (lbs/day)	**7.94**	**150.72**	**17.92**	**8.54**	**2.41**
SCAQMD Threshold (maximum lbs/day)	**75.0**	**550.0**	**100.0**	**150.0**	**55.0**
Exceeds?	**No**	**No**	**No**	**No**	**No**

Source: Sacramento Metropolitan Air Quality Management District *Road Construction Emissions Model* (May 2018), compiled by LSA (July 2018).
CO = carbon monoxide
lbs/day = pounds per day
NO_X = oxides of nitrogen
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gases
SCAQMD = South Coast Air Quality Management District

As shown in Table 3.3.C, with the implementation of standard construction measures (providing 50 percent effectiveness) such as frequent watering (e.g., a minimum of twice per day) as well as other emission reduction methods specified in Mitigation Measure AQ-1, all criteria pollutant emissions would be below SCAQMD daily thresholds. Fugitive dust, exhaust, and NO_x emissions from construction activities would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or State ambient air quality standard. Therefore, impacts would be less than significant with mitigation incorporated.

Long-Term (Operational) Emissions. The purpose of the proposed Project is to improve pedestrian/bicyclist safety and traffic flow on and in the vicinity of the Fairview Street bridge. The proposed Project would not construct or permit the construction of any trip-generating land uses. Because the Project would add lane capacity to the Fairview Street bridge, some traffic currently using other routes would use the widened Fairview Street bridge, which would increase VMT in the area, which could increase criteria pollutant emissions. On the other hand, the improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways, which would have the potential to reduce vehicle trips and increase the use of alternate means of transportation. Therefore, the Project would not result in a significant increase in the generation of vehicle trips that would increase criteria pollutant emissions. The proposed Project would result in low levels of off-site emissions due to energy generation associated with lighting along the roadway segment and the Fairview Street bridge. However, these emissions would be minimal and would not exceed the pollutant thresholds established by the SCAQMD.

In addition, the Project's Traffic Impact Analysis (TIA; Appendix A) shows that the intersections of Fairview Street/17th Street and Fairview Street/9th Street operate at unsatisfactory level of service (LOS) E or worse during one or both peak hours in existing conditions. The unsatisfactory LOS (average vehicle delay at intersections in the Project area) cause more idling emissions to occur.

The proposed widening of Fairview Street from four through lanes to six through lanes between 9th Street and 16th Street would accommodate future traffic volumes with satisfactory LOS. The increase in traffic capacity would increase average vehicle speeds and reduce the average vehicle delay during peak-hour traffic, both of which would reduce the rate of vehicle emissions. Therefore, the proposed Project would result in a beneficial impact to regional and local air quality. As a result, Project operation would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or State ambient air quality standard, and no mitigation is required.

c. Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant with Mitigation Incorporated. Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The closest sensitive receptors include the single-family and multifamily residences located adjacent to Fairview Street. In addition, the REACH Academy Community Day Intermediate and High School is located adjacent to the southern border of the Project site.

Construction of the proposed Project may expose these surrounding sensitive receptors to airborne particulates and fugitive dust, as well as a small quantity of construction equipment pollutants (i.e., usually diesel-fueled vehicles and equipment). The Construction Contractor would be required to minimize emissions by following standard construction practices and complying with SCAQMD rules (i.e., Rules 402 and 403). Rule 402 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site. Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. As described in Response 3.3.2(b), additional construction emissions reduction methods would be implemented as specified in Mitigation Measure AQ-1. With implementation of Mitigation Measure AQ-1, sensitive receptors would not be exposed to substantial pollutant concentrations during construction.

As discussed above, increase in traffic capacity would increase average vehicle speeds and reduce the average vehicle delay during peak-hour traffic, both of which would reduce the rate of vehicle emissions. Therefore, the proposed Project would result in a beneficial impact to regional and local air quality. As such, the proposed Project would not result in an increase in air pollution compared to existing conditions. Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations during Project operation.

d. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact. SCAQMD's *CEQA Air Quality Handbook* identifies various secondary significance criteria related to odorous air contaminants. Substantial odor-generating sources include land uses such as agricultural activities, feedlots, wastewater treatment facilities, landfills, or heavy manufacturing uses. The proposed Project does not include any such uses or activities that would result in other emissions such as those leading to odors. Some objectionable odors may emanate from the operation of diesel-powered construction equipment during construction of the proposed Project that could be noticed by people adjacent to the construction area. However, these construction odors would be limited to the construction period, would disperse quickly, and would not adversely affect a substantial number of people. Therefore, construction impacts would be less than significant, and no mitigation is required.

The proposed Project would consist of road widening and bridge replacement, which would not produce other emissions leading to odors that would adversely affect a substantial number of people. Project operation impacts would be less than significant, and no mitigation is required.

3.3.3 Mitigation Measures

Mitigation Measure AQ-1 **Construction Emissions Control.** The Construction Contractor will adhere to the following procedures during construction and will provide the City of Santa Ana (City) Public Works Director or designee with documentation that these procedures were implemented during construction activities:

- The contractor will adhere to the Greenbook (2018 or most current) specification: Section 3-12.2 Air Pollution Control. The Contractor will not discharge smoke, dust, equipment exhaust, or any other air contaminants into the atmosphere in such quantity as will violate any federal, State, or local regulations. The contractor will also abate dust nuisance by cleaning, sweeping and spraying with water, or other means as necessary.

- The contractor will adhere to the Caltrans Standard Specifications for Construction, Sections 14.9-01, 14.9-02, 14-9.03, 18-1.02C, and 18-1.03 (or Greenbook [2018 or most current] equivalent specifications). 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.

- Water or a 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 in compliance with the SCAQMD Rule 403 (Fugitive Dust).

- Soil binder will be spread on any unpaved roads used for construction purposes, and on all Project construction parking areas (providing an estimated 50 percent reduction of fugitive emissions) in compliance with the SCAQMD Rule 403 (Fugitive Dust).

- Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions in compliance with the SCAQMD Rule 403 (Fugitive Dust).

- Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low-sulfur fuel as required by CCR Title 17, Section 93114.

- 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 in compliance with the SCAQMD Rule 403 (Fugitive Dust).

- Equipment and material storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly in compliance with the SCAQMD Rule 402 (Nuisance).

- Environmentally sensitive areas 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 [as required by CCR Title 13, Section 2485(c)].

- Track-out reduction measures will be used, such as gravel pads at Project access points to minimize dust and mud deposits on roads affected by construction traffic, in accordance with the

State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4).

- 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 during transportation in compliance with the SCAQMD Rule 403.

- Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce PM emissions [State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4)].

- 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 (consistent with the traffic control plan approved by the City of Santa Ana Traffic Engineer).

- Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown PM 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 require controls such as dampened straw [Caltrans Standard Specifications for Construction, Sections 18.1-02C (Dust Control Binders) and 18-1.03 (Construction – Dust Palliatives) or Greenbook (2018 or most current) equivalent].

- During demolition, 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 shall be either sufficiently watered or securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized 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.

- Project construction plans will show the duration of construction. Ozone precursor emissions from construction equipment vehicles will be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications.

- 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.

- Construction activities will adhere to the City Special Provisions, Greenbook (2018 or most current) standard specifications, or California Department of Transportation (Caltrans) Standard Specifications for Construction, Sections 14-9.02 and 14-9.03, as applicable.

- Should the Project geologist determine that asbestos-containing materials (ACMs) are present at the Project area during final inspection prior to construction, the appropriate methods will be implemented to remove ACMs.

- All construction vehicles both on and off site shall be prohibited from idling in excess of 5 minutes.

- The Construction Contractor shall require that all off-road diesel-powered construction equipment with greater than 50 horsepower used for the Project meets the California Air Resources Board Tier 4 emissions standards.

3.4 BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

3.4.1 Existing Setting

The discussion of existing biological resources in, and in the vicinity of, the Project area and the analyses of the potential effects of the proposed Project on those resources provided in this section are based on the Natural Environment Study[8] (NES; Appendix A) for the Project.

The Biological Study Area (BSA) is located in Santa Ana in Orange County along Fairview Street between Civic Center Drive and 17th Street, as shown in Figure 4. The 27.32-acre (ac) BSA encompasses the Project direct impact areas (temporary and permanent) as well as a buffer area to account for any potential proximity effects (e.g., noise, vibration, dust, or lighting) that may occur outside the direct impact areas.

8 LSA Associates, Inc. 2018a. *Natural Environment Study (Minimal Impacts)*. December.

LSA

LEGEND

- Biological Study Area (BSA)
- Existing Pier Walls (0.09 acres total)
- Proposed Pier Walls (0.05 acres total)
- Potential Bike Detour in River*
- Proposed Roadway Widening
- Corps of Engineers (4.18 acres)
- CDFW (5.55 acres)

*Note: Potential bike detour footprint is approximate.

0 100 200
FEET

SOURCE: Google (2018)

I:\WKE1702\GIS\AquaticResources.mxd (2/17/2020)

FIGURE 4

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Aquatic Resources

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The BSA is almost entirely developed with residential, commercial, and transportation uses. Vegetation within the BSA primarily consists of ornamental trees and shrubs, lawns, and several disturbed and barren areas. Fairview Triangle Park contains ornamentally planted native trees and shrubs, and is located in the central portion of the BSA adjacent to the Santa Ana River.

Elevations range from approximately 80 to 95 ft above mean sea level (amsl) across the entire BSA. The topography of the BSA gently slopes downhill from east to west. The climate is classified as Mediterranean (i.e., arid climate with hot, dry summers and moderately mild, wet winters), with the average annual precipitation being 13.6 inches. Although most of the precipitation occurs from November through March, thunderstorms may occur at other times of the year and can cause high precipitation rates. On average, monthly high temperatures range between 69 degrees Fahrenheit (°F) and 85°F, and monthly low temperatures range between 46°F and 64°F.

The proposed Project is located within the Santa Ana River Watershed, which covers an area of approximately 210 square miles (sq mi) in Orange County. The headwaters of the entire 2,650 sq mi Santa Ana River Watershed begin in the San Bernardino Mountains and cross Riverside and Orange Counties before ultimately entering the Pacific Ocean. Flows within the Santa Ana River can be attributed to storm water runoff, urban runoff, and treated wastewater.

3.4.1.1 Biological Conditions in the Study Area

The primary vegetation/land cover type in the BSA is classified as developed with four subtypes, including flood control channel, transportation, ornamental landscaping, and disturbed or barren. The BSA is located within urban portions of Santa Ana with no connection to undisturbed or natural lands.

3.4.1.2 Habitats and Natural Communities of Concern

Jurisdictional Waters. Section 404 of the Clean Water Act (CWA) and Section 1602 of the California Fish and Game Code regulate activities affecting resources under the jurisdiction of the United States Army Corps of Engineers (USACE) and the California Department of Fish and Wildlife (CDFW), respectively. “Waters of the United States” under the jurisdiction of USACE include navigable coastal and inland waters, lakes, rivers, and streams and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce.

The BSA contains one jurisdictional drainage feature (the Santa Ana River), as discussed in further detail in the corresponding *Jurisdictional Delineation Report* (Appendix D of the NES).

Special-Status Plant Species. Plant species are considered to be of special concern based on the following: (1) federal, State, or local laws regulating impacts to them; (2) limited distributions; and/or (3) the presence of habitat required by the special-status plants occurring in the vicinity of the BSA. One plant species (Ventura marsh milk-vetch), which is federally and State-listed as endangered, was identified by the United States Fish and Wildlife Service (USFWS) as potentially occurring within the vicinity of the BSA, although there are no known nearby occurrence records. The CDFW California Natural Diversity Database (CNDDB) indicated three additional special-status plant species (Gambel’s water cress, salt spring checkerbloom, and chaparral sand-verbena) with historical occurrences within 3 mi of the BSA. However, all of these historical occurrences are presumed extirpated, and no suitable habitat for these plant species occurs within the BSA.

Special-Status Animal Species. Animal species are considered to be of special concern based on the following: (1) federal, State, or local laws regulating impacts to them; (2) limited distributions; and/or (3) the habitat requirements of special-status animals occurring in the vicinity of the site. The coastal California gnatcatcher is the only listed species identified by the USFWS as potentially occurring within the vicinity of the BSA.[9] However, there are no known occurrences of this species within the BSA or immediate vicinity, and suitable habitat for the species is absent from the BSA. The CNDDB indicated six additional special-status wildlife species (coast horned lizard, Crotch bumble bee, western yellow-billed cuckoo, California black rail, peregrine falcon, and western mastiff bat) with historical occurrences within 3 miles of the BSA. However, most of these historical occurrences are presumed extirpated and, with the exception of marginally suitable habitat for western mastiff bat, suitable habitat for these wildlife species is absent from the BSA.

The BSA contains suitable habitat for two nonlisted, special-status avian species identified in the CNDDB records search (Cooper's hawk and California horned lark). The existing Fairview Street bridge also contains suitable roosting habitat for several common and nonlisted, special-status bat species, and foraging habitat for these bat species is present within the BSA along the Santa Ana River. Each of these species is discussed in further detail below.

3.4.2 Impact Analysis

a. Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant with Mitigation Incorporated. Potential impacts to special status species are described below.

Special-Status Plant Species. Based on survey results, no special-status plant species were observed or are expected to occur within the BSA due to a lack of suitable habitat. A list of plant species observed in the BSA during the surveys is included in Appendix B of the NES. Therefore, the proposed Project is not expected to affect any special-status plant species because they are considered absent from the BSA. As such, no compensatory mitigation or minimization measures are warranted because special-status plant species are considered absent from the BSA.

Special-Status Animal Species. As indicated above, the BSA contains suitable habitat for two nonlisted, special-status avian species identified in the CNDDB records search (the Cooper's hawk and California horned lark). The existing Fairview Street bridge also contains suitable roosting habitat for several common and nonlisted, special-status bat species, and foraging

9 United States Fish and Wildlife Service. 2018. *Information, Planning, and Conservation System (IPaC) Trust Resource Report*. Website: https://ecos.fws.gov/ipac/ (accessed February 2018).

habitat for these bat species is present within the BSA along the Santa Ana River. Each of these species is discussed in further detail below.

- **Cooper's Hawk.** The Cooper's Hawk is a medium-sized raptor that occurs in wooded areas and is frequently encountered in urban areas with mature trees and open foraging areas such as parks. It is a California Special Animal, which is an administrative designation made by the CDFW and carries no formal legal status. However, Section 15380 of the *State CEQA Guidelines* indicates that these species should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein. The species is fairly common within the vicinity of the BSA and urban areas that contain large trees and open fields. Several mature ornamental trees located along the streets and residential areas within the BSA serve as potentially suitable nesting habitat for this species.

  The Cooper's hawk is the only special-status animal species observed within the BSA during the field surveys. An individual Cooper's hawk was observed flying over the BSA and perching on several large trees during the survey conducted on February 20, 2018. No evidence of nesting by this species was observed in the BSA during the surveys, and mature trees are limited in number within the BSA.

  The proposed Project is not expected to directly or adversely impact the Cooper's hawk because potentially suitable nesting habitat is limited in the BSA, and the removal of ornamental vegetation along Fairview Street would not impact suitable nesting habitat for this species. However, potential impacts to the Cooper's hawk and other nesting birds protected under the California Fish and Game Code would be mitigated by avoiding disruptions to nesting activity consistent with the Fish and Game Code. Mitigation Measure BIO-1, as detailed in Section 3.4.3 (Mitigation Measures BIO-1 through BIO-9), includes specific requirements to conduct a preconstruction nesting bird survey if vegetation removal, construction, or grading activities are planned to occur within the nesting bird season (February 1 to September 30) consistent with CDFW requirements.

  With implementation of Mitigation Measure BIO-1, potential impacts to the Cooper's hawk and other nesting birds would be less than significant.

- **California Horned Lark.** The California horned lark is a small songbird that is known to occur within the vicinity of the BSA. It is a subspecies of horned lark and is considered a California Special Animal, which is an administrative designation made by the CDFW and carries no formal legal status. However, Section 15380 of the *State CEQA Guidelines* indicates that these species should be included in an analysis of Project impacts if they can be shown to meet the criteria of sensitivity outlined therein. The subspecies utilizes open grasslands and fields and prefers bare ground for nesting. Several disturbed or barren areas in the BSA provide potentially suitable habitat for this subspecies, but it is considered marginal because of the proximity to busy urban streets and associated anthropogenic disturbances.The field survey was conducted during the breeding season, and no California horned larks were observed in or near the BSA.

The proposed Project is not expected to impact the California horned lark because it has a low probability of occurrence in the BSA. During the breeding season, the California horned lark is the only subspecies of horned lark in nondesert Southern California; however, from September through April or early May, other subspecies visit the area. Like the Cooper's hawk, impacts to the California horned lark would be mitigated by avoiding disruptions to nesting activity consistent with the Fish and Game Code. Mitigation Measure BIO-1, as identified above, includes specific requirements to conduct a preconstruction nesting bird survey if vegetation removal, construction, or grading activities are planned to occur within the nesting bird season (February 1 to September 30) consistent with CDFW requirements. Therefore, with implementation of Mitigation Measure BIO-1, potential impacts to the California horned lark would be less than significant.

- **Special-Status Bat Species.** The BSA contains potentially suitable habitat for seven special-status bat species. Two of these species are considered California Special Animals (the Yuma myotis and hoary bat), and the remaining five bat species are California Species of Special Concern (the pallid bat, western mastiff bat, southwestern yellow bat, pocketed free-tailed bat, and big free-tailed bat). "Species of Special Concern" is an administrative designation from the CDFW and carries no formal legal status. However, all bat species (regardless of listing status) and other nongame mammals are protected by California Fish and Game Code Section 4150, which states that all nongame mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by the California Fish and Game Commission. Activities resulting in the mortality of nongame mammals (e.g., destruction of an occupied bat roost, resulting in the death of bats) or disturbance that results in the loss of a maternity colony of bats (including the death of young) may be considered a "take" by the CDFW. Furthermore, any structure occupied by a bat maternity colony of any species is considered a native wildlife nursery site that is essential to the viability of local populations.Many bats use crevices or hollow cavities in bridges and culverts as day roosts and/or the open spaces between bridge beams or girders for night roosting. Bat species that commonly use human-made structures for day and/or night roosting include the pallid bat and Yuma myotis. Other species that may use these types of roosts occasionally include the western mastiff bat, pocketed free-tailed bat, and big free-tailed bat, although the pocketed free-tailed bat and big free-tailed bat are more commonly found in rocky desert areas and are considered rare in California. Bats may also roost in trees situated in the vicinity of human-made structures. Although bat roosts in structures can be relatively easy to identify, tree roosts are more cryptic and require close examination. Some species of bats (e.g., the western yellow bat and hoary bat) day roost in the foliage of trees. Other bat species (e.g., the pallid bat) commonly day roost in crevices or cavities found in mature trees and snags.

  Within the BSA, suitable bat roosting habitat is present within the existing Fairview Street bridge, and suitable foraging habitat is present along the Santa Ana River.

  The Fairview Street bridge over the Santa Ana River is a concrete tee beam bridge. This type of bridge contains structural elements that are suitable for and commonly used by both day- and night-roosting bats. Crevice habitat suitable for day-roosting bats (including maternity colonies) is present in the two hinges and in portions of a longitudinal joint near the middle of the structure, while night-roosting habitat is present throughout the bridge structure in the spaces between the concrete girders (refer to Appendix C, Representative Site Photos, of the NES). These girders form cavities in the underside of the bridge deck that trap warm air and offer shelter from the wind. Cliff swallow mud nests were also present throughout the girders of the bridge at the time of the assessment. The swallow mud nests may also provide day-roosting habitat for bat species, including the Yuma myotis and Mexican free-tailed bats, which have been documented day roosting in swallow mud nests and may use the mud nests observed on the bridge structure.

Although the Santa Ana River is unvegetated and concrete-lined in the vicinity of the Fairview Street bridge, water within the channel as well as ornamental vegetation associated with nearby residences provides foraging habitat for a variety of bat species, thereby increasing the likelihood that this structure is used for roosting.

No bats were observed during the daytime habitat assessment or the nighttime emergence survey; however, some scattered guano was observed beneath the hinges, confirming the use of these crevices by individual bats.

A concrete double-box culvert is situated within 300 ft of the Fairview Street bridge over the Santa Ana River. This culvert structure was not entered during the assessment because the entrances to each box were partially gated and because there were indications of human habitation, both of which presented potential safety considerations and reduced the likelihood that roosting bats were present.

Since the existing Fairview Street bridge over the Santa Ana River will be demolished for the proposed Project, potential direct and indirect impacts to roosting bats may occur. However, there is no evidence of maternity colonies roosting within the BSA. Potential impacts to bats would be mitigated by avoiding potential for take of individual roosting bats, incorporating alternate bat roosting habitat into the design of the new bridge, removing swallow nests in the fall (i.e., September or October) and ensuring they do not fall to the ground or are otherwise destroyed, minimizing indirect impacts during nighttime work associated with lighting, and designing new bridge lighting such that light would not overspill into the Santa Ana River.

Mitigation Measures BIO-2 and BIO-3 include specific requirements to minimize the potential for take of individual roosting bats and impacts to suitable day- and night-roosting bat habitat within the Fairview Street bridge over the Santa Ana River. Mitigation Measure BIO-4 includes requirements to avoid potential impacts to bats day roosting in the swallow mud nests at the Fairview Street bridge over the Santa Ana River. In addition, Mitigation Measures BIO-5 and BIO-6 include requirements to minimize any potential indirect impacts to bats foraging and night roosting at the Fairview Street bridge over the Santa Ana River.

Since the proposed Project would not affect the culverts and any potential impacts to bats would be avoided by implementing Mitigation Measures BIO-2 through BIO-6 above, potential impacts to bats would be reduced to a less-than-significant level.

Therefore, with implementation of Mitigation Measures BIO-1 through BIO-6, the proposed Project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. Impacts would be less than significant with mitigation incorporated.

b. Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Less Than Significant Impact. Habitats are considered to be of special concern based on the following: (1) federal, State, and/or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals.

There are no habitats or natural communities of concern within or immediately adjacent to the BSA. The BSA is composed entirely of developed areas, with some ornamental and weedy vegetation. The BSA has low biological value to native plant and wildlife species. Therefore, the proposed Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW or USFWS. This impact would be less than significant. No mitigation is required.

c. Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less Than Significant with Mitigation Incorporated. As identified above, the BSA contains one jurisdictional drainage feature (the Santa Ana River), as discussed in further detail in the corresponding *Jurisdictional Delineation Report* (Appendix D of the NES). The Santa Ana River within the BSA is an unvegetated, concrete-lined intermittent drainage feature. This channel conveys flows attributed to local urban runoff and seasonal storm water. The low-flow channel located within the center of the channel bed had standing water at the time of the field survey. The Santa Ana River has an ordinary high water mark (OHWM) determined to be 21 ft up from the channel bed. Downstream of the BSA, the channel has a direct nexus to the Pacific Ocean (a navigable Water of the United States) and is tidally influenced at its mouth. However, the tidal influence does not extend to the BSA, and there are no waters subject to jurisdiction under Section 10 of the Rivers and Harbors Act. There are no wetlands or riparian areas present within the BSA. The total acreage of potential nonwetland USACE jurisdiction within the BSA is 4.18 ac.

Because there is no current publicly issued guidance on determining Regional Water Quality Control Board (RWQCB) jurisdictional areas, jurisdiction was determined based on the federal definition of Waters of the United States as recommended by the State Water Resources Control Board's *Workplan: Filling the Gaps in Wetland Protection*.[10] RWQCB jurisdiction is considered coincident with USACE jurisdiction (4.18 ac) for purposes of CWA Section 401 certification.

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10 Regional Water Quality Control Board. 2004. *Workplan: Filling the Gaps in Wetland Protection*.

Under California Fish and Game Code Section 1602, the CDFW takes jurisdiction over rivers, streams, and lakes. The State's jurisdiction generally includes the streambed/lakebed to the top of the bank and to the outer edge of associated riparian vegetation, where present. Within the BSA, California Fish and Game Code aquatic resources extend beyond the OHWM to the top of the bank within the trapezoidal portions of the Santa Ana River. There is no associated riparian vegetation within the BSA. The total acreage of potential CDFW streambed jurisdiction within the BSA is 5.55 ac.

The proposed Project involves replacing the existing Fairview Street bridge with a wider roadway bridge. As shown on Figure 4, eight existing pier walls within the riverbanks (totaling approximately 0.09 ac) would be replaced with four new pier walls (totaling approximately 0.05 ac) within delineated USACE/RWQCB and CDFW nonwetland aquatic resources. The total proposed permanent fill is 0.05 ac for USACE/RWQCB- and CDFW-delineated aquatic resources. Since the proposed support structures are smaller in area than the existing support structures, a net increase in channel capacity/Waters of the United States would occur under the proposed Project.

Specifically, there would be a net decrease of 0.0175 ac of permanent fill within delineated Waters of the United States, and a net decrease of 0.04 ac of permanent fill within delineated CDFW aquatic resources.

As shown on Figure 4, a potential temporary bike detour route would be constructed within the Santa Ana River channel. This potential detour route would be constructed and deconstructed during dry-season work within the channel. The detour route would have a dirt base with an asphalt surface, and would be entirely removed following construction of the proposed Project. Impacts associated with the potential bike detour route shown on Figure 4 would amount to 0.11 ac of temporary fill within delineated Waters of the United States and 0.13 ac of temporary fill within delineated CDFW aquatic resources. In addition, temporary fills associated with dewatering activities and/or materials staging within the BSA will likely be required to complete the bridge removal and replacement. Such temporary fills would not permanently reduce channel capacity or result in the loss of aquatic resources. Indirect effects such as dust and construction-related runoff are also possible, but such impacts would be effectively avoided or minimized by implementing standard best management practices (BMPs) during construction.

No compensatory mitigation is required because the proposed Project would not adversely impact any jurisdictional wetlands, riparian areas, or Waters of the United States. A net increase of channel capacity/Waters of the United States would occur with implementation of the proposed Project.

Since work would be occurring within jurisdictional aquatic resources, resource agency permits (USACE Section 404 Nationwide Permit authorization, CDFW Section 1602 Streambed Alteration Agreement, and RWQCB Section 401 Water Quality Certification) will likely be required for the proposed Project. The purpose of these permits is to ensure that projects that impact jurisdictional areas do not impair water quality or habitat. The resource agency permits will include specific conditions to be implemented to avoid substantial impacts to water quality or habitat. Mitigation Measure BIO-7 requires the submittal of permit applications and compliance with permit conditions.

In order to avoid impacts to aquatic resources within the Santa Ana River and adjacent habitat areas, standard BMPs are necessary to protect water quality and prevent the spread of invasive species. Mitigation Measure BIO-8 includes BMPs to prevent loose soil or pollutants associated with the proposed Project from inadvertently entering the channel to protect water quality. Mitigation Measure BIO-9 includes BMPs to prevent the spread of invasive plant species that could degrade aquatic habitat areas.

Therefore, with implementation of Mitigation Measures BIO-7 through BIO-9, the proposed Project would not have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Impacts would be less than significant with mitigation incorporated.

d. Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less Than Significant Impact. An official Endangered Species Act Species List was obtained from the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) on March 16, 2018. An updated official species list was received on October 28, 2018, and is included in Appendix A of the NES. No Essential Fish Habitat is present in the BSA, and a *No Effect* determination was made for the Federal Endangered Species Act (FESA) listed species identified during the literature review; therefore, no further consultation with NOAA Fisheries is anticipated to be required.

As identified above, the BSA encompasses the Project direct-impact areas (temporary and permanent) as well as a buffer area to account for any potential proximity effects (e.g., noise, vibration, dust, or lighting) that may occur outside the direct-impact areas. The BSA is located within urban portions of Santa Ana with no connection to undisturbed or natural lands. The proposed Project would have limited permanent impacts to vegetation in the BSA, which mainly consists of ornamental or ruderal (weedy) species that have low habitat value for most native animal species. The wildlife species that occur in the Project vicinity are adapted to the urban–wildland interface, and the Project would not introduce new affects to the area. The noise, vibration, light, dust, or human disturbance within construction areas would only temporarily deter wildlife from using areas in the immediate vicinity of construction activities. These indirect effects could temporarily alter migration behaviors, territories, or foraging habitats in select areas. However, because these are temporary effects, it is likely that wildlife already living and moving in close proximity to urban development would alter their normal functions for the duration of the Project construction and then reestablish these functions once all temporary construction effects have been removed. The proposed Project would not place any permanent barriers within any known wildlife movement corridors or interfere with habitat connectivity. Therefore, the proposed Project would not have a substantial impact on native resident or migratory fish, migratory wildlife corridors, or native wildlife nursery sites. Impacts would be less than significant, and no mitigation is required.

e. Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The Project area is located in an urban setting. The City's General Plan Conservation Element establishes objectives that focus on the preservation of open space and cultural resources, and protecting the public's health and welfare. In addition, the City's Municipal Code Chapter 33, Article VII, Regulation of the Planting, Maintenance, and Removal of Trees establishes policies, regulations, and standards to ensure that the City continues to realize the benefits provided by its urban forest. The Project would require removal of vegetation and ornamental trees and replacement of the existing bridge and would comply with the City's tree ordinance. No impact would occur, and no mitigation is required.

f. Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The Project area is not within the boundaries of any an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or State habitat conservation plan. Therefore, the proposed Project would not conflict with the provisions of an adopted HCP, NCCP, or other approved conservation plan, and no impacts would occur. No mitigation is required.

3.4.3 Mitigation Measures

Mitigation Measure BIO-1 **Nesting Bird Surveys and Avoidance.** If vegetation removal, construction, or grading activities are planned to occur within the nesting bird season (February 1 to September 30), the City of Santa Ana (City) Public Works Director or designee shall ensure that a qualified biologist conducts a preconstruction nesting bird survey no more than three days prior to the start of such activities. The nesting bird survey shall include the Project site and areas immediately adjacent to the site that could potentially be affected by Project-related activities such as noise, vibration, increased human activity, and dust, etc. For any active nest(s) identified, the qualified biologist shall establish an appropriate buffer zone around the active nest(s). The appropriate buffer shall be determined by the qualified biologist based on the species, location, and nature of the proposed activities. Project activities shall be avoided within the buffer zone until the nest is deemed no longer active by the qualified biologist.

Mitigation Measure BIO-2 **Bat Eviction/Exclusion.** To avoid direct mortality of individual bats, the City Public Works Director or designee shall ensure that humane evictions (if bats are present) and exclusions of roosting bats shall be performed under the supervision of a California Department of Fish and Wildlife (CDFW) approved bat biologist prior to bridge demolition activities. Eviction/exclusion activities shall be performed in the fall (September or October) prior to bridge demolition. Exclusion activities may be implemented in one or two phases at the discretion of the qualified bat biologist and in coordination with the City Public Works Director or designee and Project Design Team.

Mitigation Measure BIO-3 **Alternate Bat Roosting Habitat.** The City Public Works Director or designee shall ensure that alternate bat roosting habitat is incorporated into the design of the new bridge to replace crevice habitat lost from removal of the existing Fairview Street bridge over the Santa Ana River. The specifications for this replacement habitat shall be designed in consultation with a qualified bat biologist.

Mitigation Measure BIO-4 **Swallow Nest Removal.** The City Public Works Director or designee shall ensure that if swallow nests are removed to prevent swallows from nesting within the Project area during construction activities, they shall be removed in the fall (i.e., September or October) prior to expected or potential overwintering use by bats, and in a manner that ensures they do not fall to the ground or are otherwise destroyed, unless the absence of bats is confirmed through inspection by a qualified bat biologist.

Mitigation Measure BIO-5 **Nighttime Lighting during Construction.** To minimize temporary indirect impacts during nighttime work for Project construction within 200 feet of the bridge structures, the Construction Contractor shall ensure that night lighting is used only in the area actively being worked on and focused on the direct area of work, and airspace access to and from the roost features of a structure shall not be obstructed except in direct work areas.

Mitigation Measure BIO-6 **New Bridge Lighting.** To avoid permanent indirect impacts to roosting and foraging bats, the City Public Works Director or designee shall ensure that bridge lighting on the new bridge is designed and installed in such a way that light overspill into the Santa Ana River and beneath the bridge is limited to the greatest extent practicable.

Mitigation Measure BIO-7 **Resource Agency Permits.** Prior to construction of the Project, the City Public Works Director or designee shall submit resource agency permit applications and obtain permits authorizations from the United States Army Corps of Engineers (USACE) (Section 404 Nationwide Permit authorization), CDFW (Section 1602 Streambed Alteration Agreement), and Regional Water Quality Control Board (Section 401 Water Quality Certification). The City Public Works Director or designee shall ensure compliance with all permit conditions.

Mitigation Measure BIO-8 **Best Management Practices (BMPs) during Construction.** The Construction Contractor shall ensure that all equipment maintenance, staging, dispensing of fuel or oil, or any other such activities shall occur in designated upland areas. The designated upland areas shall be located in such a manner as to prevent any spill runoff from entering Waters of the United States and other jurisdictional waters. Silt fencing and straw wattle shall be placed in such a manner that they are able to catch or filter sediment or other construction-related debris to prevent it from entering aquatic areas, where necessary. All construction-related debris and trash shall be disposed of or secured to prevent any such waste from entering aquatic areas.

Mitigation Measure BIO-9 **Invasive Species.** In order to prevent the spread of invasive species (Executive Order 13112), the Construction Contractor shall ensure that any plants removed or soil disturbed during the course of construction are contained and properly disposed of off site. All mulch, topsoil, seed mixes, or other plantings used during landscaping activities and any erosion-control BMPs implemented shall be free of invasive plant species seeds or propagules. No vegetation listed on the California Invasive Plant Council (Cal-IPC) inventory shall be installed on the Project, and all plant palettes proposed for the Project shall be reviewed by a qualified biologist during the Final Design phase.

3.5 CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	☐	☒
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

3.5.1 Existing Setting

The discussion of cultural resources on and in the vicinity of the Project area and the analyses of the potential effects of the proposed Project on cultural resources provided in this section are based on the Historical Property Survey Report[11] (HPSR) and its attached reports (Historical Resources Evaluation Report [HRER] and Archeological Survey Report [ASR]) for the proposed Project.

The Area of Potential Effects (APE) for the proposed Project totals 11.93 ac, as shown in Appendix C. The APE includes areas where physical impacts as well as indirect effects from the proposed Project would occur. These are generally limited to the proposed Project's proposed and existing right-of-way and include the horizontal and vertical limits associated with ground-disturbing activities. The vertical APE within the areas of direct effects will extend to a maximum depth of 15 ft for bridge abutments.

3.5.1.1 Cultural and Archaeological Resources

On March 5, 2018, a record search was conducted at the South Central Coastal Information Center of the California Historical Resources Information System at California State University, Fullerton. The records search identified eight cultural resources studies that included parts of the APE. These studies include 4 surveys, 2 literature searches, 1 monitoring study, and 1 Environmental Impact Statement (EIS). An additional 31 studies have been conducted within 1 mi of the APE. These studies include 24 surveys, 2 literature searches, 3 evaluations/assessments, 1 project authorization, and 1 EIS.

There are no previously recorded sites within the APE. There have been 44 resources recorded within 1 mi of the APE (1 prehistoric and 43 historic). The prehistoric resource (a habitation site that is no longer extant) is approximately 1 mi from the APE. Of the historic resources, 1 is a railroad bridge and the other 42 are buildings. The buildings include 28 single-family residences, 10 commercial buildings, 1 single-family residence/commercial building, 2 hotels/motels, and 1 school.

11 LSA, 2019a. *Historic Property Survey Report*. June.

The Office of Historic Preservation Historic Property Data File includes properties in both Santa Ana and Garden Grove. There are 18 listed properties in Santa Ana within 1 mi of the APE. All of the properties are buildings constructed between 1898 and 1955. Seventeen of the buildings were determined ineligible for National Register of Historic Places (NRHP) listing, while one needs reevaluation. In Garden Grove, the Historic Resources Inventory (HRI) identifies 11 properties with 1 mi of the APE. These properties include nine buildings, an 1880 eucalyptus vat, and a 1976 storm drain. The storm drain was determined ineligible for National Register listing, while the eucalyptus vat needs reevaluation. The nine buildings were constructed between 1949 and 2000. All nine buildings were determined to be ineligible for listing in the National Register.

The earliest available online aerial photograph of the area dates from 1953. It shows that although there were residential housing tracts in the area, the land along what would become Fairview Street was still open agricultural land except at the north where Westminster Avenue/17th Street is, and at the south, where several buildings are just southwest of the current APE. A 1963 aerial photograph is the first to show Fairview Street and the Fairview Street bridge. By 1963, tract housing existed alongside the APE and the areas adjacent to the APE were more than half developed. A 1972 aerial photograph shows that the Fairview Street Bridge is much larger than that depicted on the 1963 aerial. The bridge on the 1972 aerial appears to be the currently existing bridge. By 1972, several undeveloped areas existed adjacent to the APE, although these did not exist in the next available aerial photograph dated 1995. Little change has occurred to the APE since 1995.

On March 16, 2018, LSA archaeologist Ivan Strudwick conducted a field survey of 3.92 ac of the total 11.93 ac APE. The survey areas consisted of approximately 2,650 ft of Fairview Street between Westminster Avenue/17th Street and Civic Center Drive West. The APE is mainly a paved, developed area, although patches of exposed sediment with some variation of ground visibility were found. One archaeological resource, an isolated fragment of marine shell, was found during the survey. Under CEQA, isolated finds are not considered important/significant resources. As such, the isolated shell fragment is not important and requires no additional evaluation for the proposed Project.

On April 4, 2019, architectural historians Casey Tibbet and Eugene Heck conducted an intensive-level pedestrian survey of the historic-period built environment in the APE. During the survey, Ms. Tibbet took digital photographs of the exteriors of the historic-period buildings and features and made detailed notations regarding their current conditions, integrity levels, physical characteristics, and setting. In addition, Ms. Tibbet and Mr. Heck completed a reconnaissance-level survey of the general setting and of the buildings and features.

3.5.2 Impact Analysis

a. Would the project cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

No Impact. According to the HPSR, all resources were determined to be ineligible for listing in the National Register and are not eligible to qualify as historical resources as defined in Section 15064.5 of CEQA. As a result, there are no resources in the Project area that are considered historical resources as defined in Section 15064.5 of CEQA. Therefore, the proposed Project would not cause a substantial adverse change in the significance of a historical resource. Therefore, no impacts to historical resources would occur as a result of the construction and operation of the proposed Project. No mitigation is required.

b. Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Less Than Significant with Mitigation Incorporated. A single shell fragment (*Chione californiensis*) was found in the APE in an undeveloped area on the west side of Fairview Street just south of the Santa Ana River. No other cultural resources were found in the vicinity; thus, the resource is an isolated find. Isolated finds are not considered important/significant under CEQA. As such, the isolated shell fragment found in the current APE is not an important resource and requires no further evaluation.

No additional archaeological resources were identified within the APE through archival research or the field survey. The majority of the APE consists of paved asphalt and concrete sidewalk along Fairview Street from Westminster Avenue/17th Street south to Civic Center Drive. A small amount of acreage also includes areas outside of the sidewalk including adjacent streets, and the building, lawn, and parking lot at 1002 Fairview Street.

All surveyable areas in the APE exhibited high levels of disturbance from road and bridge construction and adjacent home construction. Buried utilities have also added to the disturbance of the APE. The entire APE has been substantially altered during previous construction activities. As such, the likelihood of encountering intact archaeological resources is very low. However, if previously unidentified cultural materials are unearthed during construction, work should be halted in that portion of the Project area until a qualified archaeologist can assess the significance of the find. As a precautionary measure to avoid any impacts to potential archaeological resources, Mitigation Measure CULT-1 requires a professional archaeologist to evaluate any cultural material encountered during construction. Therefore, with implementation of Mitigation Measure CULT-1, the proposed Project would not cause a substantial adverse change in the significance of an archaeological resource.

c. Would the project disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant with Mitigation Incorporated. No known human remains are known to exist in or near the Project area. However, there is a possibility that unanticipated human remains may be encountered during ground-disturbing Project-related activities. As a precautionary measure, Mitigation Measure CULT-2 requires adherence to California Code of Regulations (CCR) Section 15064.5(e), State Health and Safety Code Section 7050.5, and Public Resources Code (PRC) Section 5097.98, with respect to discovery of human remains during construction activities. With implementation of Mitigation Measure CULT-2, the proposed Project would reduce the potential for impacts to unknown buried human remains to a less-than-significant level.

3.5.3 Mitigation Measures

Mitigation Measure CULT-1 **Cultural Resources Discovery.** If archaeological cultural resources are encountered during construction, the Construction Contractor shall ensure that work within 50 meters (165 feet) of the area of the discovery is stopped and will notify the City of Santa Ana (City) Public Works Director or designee. A professional archaeologist (i.e., an archaeologist registered with the Register of Professional Archaeologists) will be contacted and will visit the site to assess the nature and significance of the find. The archaeologist will then develop proper mitigation measures for the discovery. Work could continue on other parts of the Project while cultural resources mitigation takes place.

Mitigation Measure CULT-2 **Human Remains.** The City Public Works Director or designee shall verify that all construction plans specify the requirements of California Code of Regulations (CCR) Section 15064.5(e), State Health and Safety Code Section 7050.5, and Public Resources Code (PRC) Section 5097.98.

In the event that human remains are encountered in the Project area during construction activities, work within 50 feet of the discovery shall be redirected and the County Coroner notified immediately consistent with the requirements of CCR Section 15064.5(e). If the remains are determined to be Native American, the County Coroner shall notify the Native American Heritage Commission (NAHC), which shall determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The MLD recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated items in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment.

Consistent with CCR Section 15064.5(d), if the remains are determined to be Native American and an MLD is notified, the City Public Works Director or designee shall consult with the MLD, as identified by the NAHC, to develop an agreement for treatment and disposition of the remains.

3.6 ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

3.6.1 Existing Setting

In 2002, the Legislature passed Senate Bill (SB) 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

The CEC is in the process of adopting the 2019 Integrated Energy Policy Report.[12] The 2019 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2019 Integrated Energy Policy Report covers a broad range of topics, including implementation of SB 350, integrated resource planning, distributed energy resources, transportation electrification, solutions to increase resiliency in the electricity sector, energy efficiency, transportation electrification, barriers faced by disadvantaged communities, demand response, transmission and landscape-scale planning, the California Energy Demand Preliminary Forecast, the preliminary transportation energy demand forecast, renewable gas (in response to SB 1383), updates on Southern California electricity reliability, the natural gas outlook, and climate adaptation and resiliency.

3.6.2 Impact Analysis

a. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?

Less Than Significant Impact. This analysis evaluates energy consumption for both construction and operation of the proposed Project, including diesel fuel use for construction off-road equipment.

12 California Energy Commission. 2019. *2019 Integrated Energy Policy Report.* Docket #19-IEPR-01.

Construction. Construction of the proposed Project would require the use of energy to fuel grading vehicles, trucks, and other construction vehicles. All or most of this energy would be derived from nonrenewable resources. Construction activities are not anticipated to result in an inefficient use of energy, as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the proposed Project. Energy usage on the Project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. Therefore, construction energy impacts would be less than significant. No mitigation is required.

Operation. Typically, energy consumption is associated with fuel used for vehicle trips and natural gas and electricity use. Energy use consumed during operation of the proposed Project would be associated with fuel used for vehicle trips and electricity consumption associated with the proposed Project. Operation of the proposed Project would not require the consumption of natural gas.

The purpose of the proposed Project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element. Currently, the Fairview Street bridge is utilized by bicyclists and pedestrians to cross over the Santa Ana River, but there are no existing sidewalks or bikeways on the bridge. As part of the proposed Project, the Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. These features would improve the safety of the area for both motorized and nonmotorized travel.

Vehicles using the roadway would continue to consume energy. Because the Project would add lane capacity to the Fairview Street bridge, some traffic currently using other routes would use the widened Fairview Street bridge, which would increase VMT in the area, which could increase fuel demand. On the other hand, the improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways, which would allow for a decreased dependence on nonrenewable energy resources. In addition, non-vehicular energy use consumed by the proposed Project would be associated with minimal electricity consumption associated with lighting along the Project segment. Therefore, implementation of the proposed Project would not result in a long-term substantial demand for electricity and natural gas, nor would the Project require new service connections or construction of new off-site service lines or substations to serve the Project. The nature of proposed improvements would not require substantial amounts of energy for either construction or maintenance purposes. Therefore, the proposed Project would not use nonrenewable resources in a wasteful or inefficient manner. Therefore, operational energy impacts would be less than significant. No mitigation is required.

b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less Than Significant Impact. As indicated above, energy usage in the Project area during construction would be temporary in nature. In addition, energy usage associated with operation of the proposed Project would be relatively small in comparison to the State's available energy sources, and energy impacts would be negligible at the regional level. Because California's energy conservation planning actions are conducted at a regional level, and because the Project's total impact on regional energy supplies would be minor, the proposed Project would not conflict with California's energy conservation plans as described in the CEC's 2019 Integrated Energy Policy Report. Further, the proposed Project includes pedestrian and bicycle safety improvements to promote the use of alternative modes of transportation, which allow for a decreased dependence on nonrenewable energy resources and a reduction in energy use. Thus, as shown above, the proposed Project would avoid or reduce the inefficient, wasteful, and unnecessary consumption of energy and not result in any irreversible or irretrievable commitments of energy. Impacts would be less than significant. No mitigation is required.

3.7 GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

3.7.1 Existing Setting

This section is based on the Preliminary Geotechnical Information study[13] and Paleontological Analysis Memorandum (Appendix A).[14]

3.7.1.1 Geologic and Soils Information

The Project area is located in the Los Angeles physiographic basin, which is a large, relatively flat, low-lying, coastal area surrounded by mountains on the north, east, and southeast. The Project area is located in the southeastern part of the basin known as the Tustin Plain. Regional geologic studies indicate that Holocene-age, flood-plain sediments extend to a depth of a few hundred feet and overlie coarse sand and gravel of the Holocene-age Talbert aquifer. Quaternary-age sediments are about 2,000 ft thick in the region. The Quaternary sediments overlie Tertiary-age sedimentary rocks. The Mesozoic–age crystalline basement rocks are about 14,000 ft below the Project area.

[13] Earth Mechanics, Inc. 2018. *Preliminary Geotechnical Information*. March 20.

[14] LSA Associates, Inc. 2019d. *Paleontological Analysis of the Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project, Santa Ana, Orange County, California*. September 7.

The Project area is relatively flat and situated at an elevation of about 100 ft. In the natural regime, the Project area is within the Santa Ana River flood plain, and the portion of the river through the Project area is confined to a concrete-lined channel.

Exploratory boreholes, drilled in the years 2003 and 2004 in the Project area, show that the area is underlain by nonindurated alluvial sediments ranging from clay to sand to gravel. The soils are Holocene-age flood-plain sediments of the Santa Ana River. Generally, the soils within the Project area consist of alternating, interbedded layers of sand with varying fines content, lean clay with varying amounts of sand, and few silt layers. The deeper sand layers include trace to moderate amounts of fine to coarse gravel.

3.7.1.2 Paleontological Resources

Project plans, geologic maps of the Project area, and relevant geological and paleontological literature were reviewed to determine which geologic units are present in the Project area and whether fossils have been recovered in the Project area or from those or similar geologic units elsewhere in the region. In addition, a search for known fossil localities was conducted through the Natural History Museum of Los Angeles County (LACM) to determine the status and extent of previously recorded paleontological resources within and surrounding the Project area. A field survey of the Project area was also conducted to note the sediments at the surface; relocate any known paleontological localities, if present; and identify any unrecorded paleontological resources exposed on the surface of a Project area.

Results of the literature review indicate that the Project area is located at the northern end of the Peninsular Ranges Geomorphic Province, a 900 mi long northwest-southeast-trending structural block that extends from the Transverse Ranges in the north to the tip of Baja California in the south. Within this larger region, the Project is located in the Los Angeles Basin, a broad alluvial lowland bounded to the north and east by the San Gabriel and Santa Ana Mountains, respectively, and by the Pacific Ocean to the southwest.

Geologic mapping by Morton and Miller shows that the Project area contains Very Young Wash Deposits and Young Alluvial Fan Deposits. In addition, because the Project area has been previously developed, some amount of Artificial Fill is likely present at the surface above the geologic unit mapped by Morton and Miller. Ages for the geologic epochs and subdivisions are based on the International Chronostratigraphic Chart prepared by the International Commission on Stratigraphy and Walker et al.

Artificial Fill consists of sediments that have been removed from one location and transported to another location by human activity, rather than by natural means. The transportation distance can vary from a few feet to many miles, and composition is dependent on the source and purpose. While Artificial Fill may contain fossils, these fossils have been removed from their original location and are thus out of stratigraphic context. Therefore, they are not considered important for scientific study. As such, Artificial Fill has no paleontological sensitivity.

The Very Young Wash Deposits are late Holocene in age (less than 4,200 years ago) and consist of unconsolidated sand and gravel in active washes, channels on active alluvial fans, and ephemeral streams. These deposits accumulated along river and stream channels as floods and debris flows carried sediment down from higher elevations. The size, color, and types of clasts in these deposits are dependent on the local bedrock from which they were derived, with boulder-size clasts more common closer to the mountains and in areas prone to flash floods. These deposits are mapped along the Santa Ana River channel in the Project area. Although Holocene deposits can contain remains of plants and animals, only those from the middle to early Holocene (4,200 to 11,700 years ago) are considered scientifically important. Older deposits that may contain scientifically important fossils may be encountered at undetermined depths below these late Holocene deposits. Therefore, the Very Young Wash Deposits are considered to have low paleontological sensitivity.

Young Alluvial Fan Deposits, which are Holocene to late Pleistocene in age (less than 126,000 years ago), consist of unconsolidated gravel, sand, and silt with occasional cobbles and boulders near mountain fronts. These sediments were deposited by flooding streams and debris flows coming down from higher elevations and generally form a fan or lobe shape at the base of hills and mountains. As noted above, only fossils from the middle to early Holocene (4,200 to 11,700 years ago) are considered scientifically important. These Holocene deposits overlie older Pleistocene deposits, which have produced scientifically important fossils elsewhere in the region. These older deposits span the end of the Rancholabrean North American Land Mammal Age (NALMA), which dates from 11,000 to 240,000 years ago and was named for the Rancho La Brea fossil site in central Los Angeles. The presence of *Bison* defines the beginning of the Rancholabrean NALMA, but fossils from this time also include other large and small mammals, reptiles, fish, invertebrates, and plants. There is a potential to find these types of fossils in the older sediments of this geologic unit, which may be encountered below a depth of approximately 10 ft. Therefore, these deposits are assigned low paleontological sensitivity from the surface to a depth of 10 ft and high sensitivity below that mark.

According to the locality search conducted by the LACM, there are no known fossil localities within the boundaries of the proposed Project. The LACM reports that the Project area is underlain by deposits of younger Quaternary alluvium overlying older Quaternary alluvium (i.e., Young Alluvial Fan Deposits). The museum notes that these deposits typically do not contain scientifically significant fossils in the uppermost layers however; they may produce important fossils at depth.

The closest vertebrate locality in these older Quaternary deposits is LACM 1339, south-southwest of the Project area near the top of the bluffs along Adams Avenue in Costa Mesa. This locality produced a specimen of horse (*Equus*) at a depth of 43 feet below the street. The next closest locality is LACM 2032, northeast of the Project area near the intersection of Mission Road and Daly Street. That locality yielded specimens of mammoth (*Mammuthus*) and camel (Camelidae) at a depth of 15 ft below the top of the bluff. Locality LACM 4943, which is located northeast of the Project area near the intersection of Glassell Street and Fletcher Avenue in Orange, produced a specimen of horse (*Equus*) at a depth of 8 to 10 ft below the surface.

The LACM believes that shallow excavations in the Young Alluvial Fan Deposits in the Project area are unlikely to encounter any scientifically important vertebrate fossils. However, the museum notes that deeper excavations into these deposits may encounter scientifically significant vertebrate remains and should be monitored to recover those remains. A copy of the letter describing the locality search results from the LACM is provided in Appendix A.

3.7.2 Impact Analysis

a. Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant Impact. No active surface faults are mapped or known to cross Santa Ana, and Santa Ana is not located in an Alquist-Priolo Earthquake Fault Zone. However, Santa Ana is in close proximity to two major faults: the Newport-Inglewood Fault Zone and the Whittier-Elsinore Fault Zone. The San Andreas and Raymond Faults are also proximate to Santa Ana. However, the Project area is not located on any active faults or any inactive fault lines.

The proposed Project includes roadway improvements and would not include the construction or rehabilitation of structures for human occupancy. Therefore, potential for the exposure of people or structures to potential substantial adverse effects related to fault rupture as provided in the Alquist-Priolo Earthquake Fault Zoning Act is less than significant. No mitigation is required.

ii. Strong seismic ground shaking?

Less Than Significant Impact. Strong seismic ground shaking has the potential to occur in the Project area and in the surrounding area due to high rates of seismic activity throughout Southern California. The extent of ground shaking associated with an earthquake depends on the size of the earthquake and the geologic material of the underlying area. As discussed in Response 3.7.2(a)(i), no active surface faults are mapped or known to cross Santa Ana; however, Santa Ana is subject to seismic shaking from faults located outside Santa Ana. The Project improvements would comply with applicable provisions of the most recent California Building Code (CBC), as well as City roadway design requirements, including requirements regarding seismic design and structural features. These regulations detail specific measures, including seismic design parameters, to minimize the risk of loss, injury, or death resulting from strong ground shaking.

With adherence to seismic engineering and design criteria, seismic ground-shaking hazards at the proposed Project would be less than significant. No mitigation is required.

iii. Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Liquefaction occurs when shallow, loose, unconsolidated, fine- to medium-grained sediments saturated with water are subjected to shaking as a result of an earthquake. This causes the soils to lose cohesion, leading to liquefaction. The possibility of seismic-related liquefaction occurring in the Project area is dependent on the occurrence of a substantial earthquake in the vicinity, the presence of sufficient groundwater to cause high pore pressures, soil grain size, plasticity, relative density, and the confining pressures of the soils in the Project area.

As discussed above, the proposed Project does not propose habitable structures and thus would not expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure (e.g., liquefaction). The original roadway design and proposed Project improvements are subject to California geotechnical standards and regulations (e.g., the CBC) to reduce impacts related to seismic hazards, including liquefaction. Therefore, the proposed Project would result in less-than-significant impacts related to seismic events, including liquefaction. No mitigation is required.

iv. Landslides?

No Impact. Seismically induced landslides and other slope failures are common occurrences during, or soon after, earthquakes in areas with significant ground slopes. Currently, there are no State-issued seismic hazard zone maps for the City.[15] The proposed Project would not introduce any new topographical features or elements that would increase the risk of landslide within the Project vicinity. Therefore, there would be no potential impacts to the proposed Project related to landslides. No mitigation is required.

b. Would the project result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. The Project area is an existing roadway, and the majority of the area is paved. Because the Project area is developed, existing topsoil has already been removed or otherwise disturbed. However, during construction, earthwork and grading activities would disturb and expose soils along the shoulder of Fairview Street. Construction activities are subject to the CBC and would be required to comply with the Construction General Permit (CGP) issued by the State Water Resources Control Board (SWRCB).

The National Pollutant Discharge Elimination System (NPDES) program regulates storm water and non-storm water discharges associated with construction or demolition activities including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance equal to or greater than 1 ac. The NPDES program requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which will prescribe BMPs that the discharger will use to protect storm water runoff and provide erosion control. Implementation of a SWPPP and the BMPs would minimize the impacts related to soil erosion to less-than-significant levels. Compliance with the CGP and the City's Water Quality Ordinance will reduce potential impacts related to erosion and loss of topsoil associated with the proposed project to levels considered less than significant. No mitigation is required.

15 California Department of Conservation. 2006. Seismic Hazard Zones. Website: http://maps.conservation.ca.gov/cgs/informationwarehouse/ (accessed August 2019).

c. Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Less Than Significant Impact. As discussed above in Response 3.7.2(a)(iii) and Response 3.7.2(a)(iv), liquefaction is not anticipated to be a concern, and the Project site is not located within an earthquake-induced-landslide area. The proposed Project would not introduce any new topographical features or elements that would change the existing geologic setting of the Project area. The proposed Project is located in a seismically active region; however the Project area is an existing roadway and the majority of the area is paved. As such, on-site geologic and soils issues such as on-site soil stability including landslides, lateral spreading, subsidence, liquefaction, and collapse are not significant due to the nature of the Project. Therefore, implementation of the proposed Project would not result in impacts associated with unstable geologic conditions. Impacts related to geologic unit stability that could result in lateral spreading, subsidence, liquefaction, or collapse would be less than significant. No mitigation is required.

d. Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Less Than Significant Impact. Expansive soils generally have a substantial amount of clay particles, which can give up water (shrink) or absorb water (swell) in response to dry and moist conditions and can result in cracking and structural failure of pavement and foundations. The extent or range of the shrink/swell is influenced by the amount and kind of clay present in the soil. The occurrence of these soils is often associated with geologic units having marginal stability. Soils comprised of sand and gravel are not expansive soils. The soils within the Project area consist of alternating, interbedded layers of sand with varying fines content, lean clay with varying amounts of sand, and few silt layers.[16] The deeper sand layers include trace to moderate amounts of fine to coarse gravel.[17] As soils within the Project area consist of sand, lean clay with sand, and silt layers, the proposed Project is not expected to create substantial risks to life or property due to expansive soils. In addition, the Project area is an existing roadway and the majority of the area is paved. Therefore, the Project would not create substantial risks to life or property due to expansive soils. Impacts would be less than significant and no mitigation is required.

e. Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The proposed Project is an improvement to the existing roadway and does not include the construction of, or connections to, a septic or alternative wastewater disposal system. Therefore, the proposed Project would not result in impacts related to the soil's capability to adequately support the use of septic tanks or alternative wastewater disposal systems, and no impacts would occur. No mitigation is required.

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16 Earth Mechanics, Inc. 2018. op. cit.

17 Ibid.

f. Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant with Mitigation Incorporated. A paleontological resources records search and literature review were conducted to determine the paleontological sensitivity of the Project area. The majority of Project excavation is anticipated to be shallower than a depth of 10 ft, with only the bridge abutments possibly extending to a depth of 15 ft. Any Artificial Fill present within the Project area has no paleontological sensitivity, the Very Young Wash Deposits have low paleontological sensitivity, and the Young Alluvial Fan Deposits have low paleontological sensitivity from the surface to a depth of 10 ft and high paleontological sensitivity below a depth of 10 ft. However, because much of the Project area has been previously developed, excavation into any existing native deposits for the abutments will have a limited impact area. Excavation of the proposed Project may inadvertently encounter and impact paleontological resources. Therefore, if paleontological resources are encountered during the course of ground disturbance, work in the immediate area of the find is required to be redirected, and a paleontologist is required to assess the find for scientific significance to avoid significant impacts to paleontological resources. Mitigation Measure GEO-1 includes these requirements. Therefore, with implementation of Mitigation Measure GEO-1, impacts to paleontological resources would be less than significant.

3.7.3 Mitigation Measures

Mitigation Measure GEO-1 **Paleontological Resources Discovery.** If paleontological resources are encountered during the course of ground disturbance, the Construction Contractor shall stop work in the immediate area of the find, notify the City Public Works Director or designee, and contact a qualified paleontologist to assess the find for scientific significance. If determined to be significant by the qualified paleontologist, the fossil shall be collected from the field. The qualified paleontologist may also make recommendations regarding additional measures, such as paleontological monitoring and documentation. If found, scientifically significant resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, cataloged, and curated into the permanent collections of a museum repository. If scientifically significant paleontological resources are collected, a report of findings shall be prepared to document the collection.

3.8 GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

3.8.1 Existing Conditions

Global climate change (GCC) describes alterations in weather features (e.g., temperature, wind patterns, precipitation, and storms) that occur across the Earth as a whole. Global temperatures are modulated by naturally occurring components in the atmosphere (e.g., water vapor, carbon dioxide [CO_2], methane [CH_4], and nitrous dioxide [N_2O]) that capture heat radiated from the Earth's surface, which in turn warms the atmosphere. This natural phenomenon is known as the "greenhouse effect." That said, excessive human-generated greenhouse gas (GHG)[18] emissions can and are altering the global climate.

The CEQA statutes, the Governor's Office of Planning and Research (OPR) guidelines, and the changes to the *State CEQA Guidelines* currently prescribe specific quantitative thresholds of significance or a particular methodology for conducting an impact analysis related to GHG effects on global climate. In contrast, as with most environmental topics, significance criteria are left to the judgment and discretion of the lead agency.

Currently, there is no Statewide GHG emissions threshold that has been used to determine the potential GHG emissions impacts of a project. Thresholds and threshold methodology are still being developed and revised by air quality districts in the State. To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD convened a GHG CEQA Significance Threshold Stakeholder Working Group. This Working Group proposed a tiered approach for evaluating GHG emissions for development projects where SCAQMD is not the lead agency. The applicable tier for the proposed Project is Tier 3; if GHG emissions are less than 3,000 metric tons (MT) of CO_2 equivalent (CO_2e) per year, Project-level and cumulative GHG emissions would be less than significant.

Individual GHGs have varying global warming potentials and atmospheric lifetimes. Because it is not possible to tie specific GHG emissions to actual changes in climate, this evaluation focuses on the Project's emission of GHGs. CO_2e is a consistent methodology for comparing GHG emissions because

18 The principal greenhouse gases (GHGs) of concern contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Water vapor is the largest naturally occurring GHG; however, it is not identified as an anthropogenic constituent of concern.

it normalizes various GHGs to the same metric. GHG emissions are typically measured in terms of metric tons of CO_2e. Therefore, for the purpose of this technical analysis, the concept of CO_2e is used to describe how much global climate change a given type and amount of GHG may cause, using the functionally equivalent amount or concentration of CO_2 as the reference. The GHG emissions estimates were calculated using the Roadway Construction Emissions Model Version 9.0.0. In addition, the Project's consistency with the City's adopted City Climate Action Plan (CAP)[19] is discussed below.

3.8.2 Impact Analysis

a. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact. The following sections describe the proposed Project's construction- and operation-related GHG impacts.

Construction GHG Emissions. GHG emissions associated with the proposed Project would occur over the short term from construction activities, consisting primarily of emissions from equipment and vehicle exhaust. The calculation presented below includes construction emissions in terms of annual CO_2e GHG emissions.

Construction activities produce combustion emissions from various sources such as grubbing/land clearing, grading/excavation, drainage/utilities/subgrading, paving, construction equipment hauling materials to and from the site, and motor vehicles transporting the construction crew. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change. Table 3.8.A presents the annual construction emissions based on the Roadway Construction Emissions Model emission estimates. Results indicate that Project construction would generate approximately a total of 1,693.17 MT of CO_2e.

Table 3.8.A: Project Construction Greenhouse Gas Emissions

Project Phase	CO_2 (tons/phase)	CH_4 (tons/phase)	N_2O (tons/phase)	CO_2e (tons/phase)
Grubbing/Land Clearing (lbs/day)	114.49	0.03	0.00	105.22
Grading/Excavation (lbs/day)	1,794.29	0.53	0.02	1,645.73
Drainage/Utilities/Subgrading (lbs/day)	1,302.57	0.31	0.02	1,193.70
Paving (lbs/day)	442.70	0.10	0.02	409.16
Maximum (tons/phase)	2,012.65	0.56	0.03	1,845.34
Total (tons/construction project)	**3,654.05**	**0.97**	**0.06**	**3,353.81**
Amortized Emissions	**146.16**	**0.04**	**0.00**	**134.15**

Source: Sacramento Metropolitan Air Quality Management District *Road Construction Emissions Model* (May 2018), compiled by LSA (July 2018).
CH_4 = methane; CO_2e = carbon dioxide equivalent; MT = metric tons
CO_2 = carbon dioxide; lbs/day = pounds per day; N_2O = nitrous oxide

19 City of Santa Ana. 2015. *Final Climate Action Plan.* December.

Per SCAQMD guidance, due to the long-term nature of the GHGs in the atmosphere, instead of determining the significance of construction emissions alone, the total construction emissions are amortized over 30 years (an estimate of the life of a project) and included in the operations analysis. To amortize the emissions over the life of a project, the SCAQMD recommends calculating the total GHG emissions for the construction activities and dividing that total by a 30-year project life. Amortized over 30 years, the total construction emissions would generate approximately 134.15 MT of CO_2e per year.

As discussed above, according to SCAQMD, a project would have less-than-significant GHG emissions if it would result in less than 3,000 MT of CO_2e per year. Based on the analysis results, the proposed Project would result in approximately 134.15 MT of CO_2e per year, which would be well below the SCAQMD's numeric threshold of 3,000 MT of CO_2e per year. Therefore, construction of the proposed Project would not generate significant GHG emissions that would have a significant effect on the environment. Therefore, construction emissions would be less than significant, and no mitigation is required.

Operational Emissions.The purpose of the proposed Project is to improve pedestrian/bicyclist safety and traffic flow on and in the vicinity of the Fairview Street bridge. The proposed Project would not construct or permit the construction of any trip-generating land uses. Because the Project would add lane capacity to the Fairview Street bridge, some traffic currently using other routes would use the widened Fairview Street bridge, which would increase VMT in the area, which could increase GHG emissions. On the other hand, the improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways, which would have the potential to reduce vehicle trips and increase the use of alternate means of transportation. Therefore, the Project would not result in a substantial increase in the generation of vehicle trips that would increase GHG emissions. The proposed Project would result in low levels of off-site emissions due to energy generation associated with lighting along the roadway segment and the Fairview Street bridge. However, these emissions would be minimal and would not exceed the pollutant thresholds established by the SCAQMD. Therefore, the proposed Project would not generate any GHG emissions or result in new vehicle trips that would contribute to an increase in GHG emissions. GHG emissions generated by the proposed Project would be less than significant, and no mitigation is required.

b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact. The City's CAP represents the City's commitment to improving the quality of life by reducing carbon pollution and energy use, both from its own operations and from the community as a whole. To develop this CAP, an inventory was conducted to determine baseline GHG emissions from the community and from municipal operations for the calendar year 2008. A forecast was made of business-as-usual emissions in the absence of any emissions reduction actions. This forecast was then adjusted to account for the emissions reduction expected from Statewide policies and from actions that have already been taken by the City since the baseline inventory.

The CAP establishes emissions reduction goals. For community-wide emissions, the reduction goal is 15 percent below the baseline year 2008 by 2020, and 30 percent below the baseline year 2008 by

2035. For municipal operations emissions, the reduction goal is 30 percent by 2020 and 40 percent by 2035. The CAP includes measures related to transportation and land use; energy; and solid waste, water, and wastewater to work toward the reduction goals.

Many of the measures included in the CAP were established for new development projects and municipal operations and would not be applicable to the proposed Project, as the proposed Project is a roadway improvement project. CAP measures that are applicable to the proposed Project relate to implementing a Safe Routes to School program, improving bike/pedestrian/transit connectivity, and converting street lights to light-emitting diode (LED). The proposed Project would be consistent with these measures, as the purpose of the proposed Project is to improve pedestrian/bicyclist safety and traffic flow on and in the vicinity of the Fairview Street bridge. These fixtures would be similar in type to other street lights throughout the City, and would be typical of pole-mounted street lights used for bridges in the City, with lighting directed onto the roadway. With implementation of Mitigation Measure AES-1, the proposed Project would include low-light level, energy-efficient lighting, consistent with the CAP measure. As discussed above, because the Project would add lane capacity to the Fairview Street bridge, some traffic currently using other routes would use the widened Fairview Street bridge, which would increase VMT in the area. On the other hand, the improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways, which would allow for increased use of alternate means of transportation. Therefore, the proposed Project would be consistent with the CAP and would not conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This impact would be less than significant, and no mitigation is required.

3.9 HAZARDS AND HAZARDOUS MATERIALS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☒	☐	☐
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

3.9.1 Existing Conditions

An Initial Site Assessment (ISA)[20] was prepared for the proposed Project that reviews, evaluates, and documents present and past land uses and practices, and visually examines site conditions to identify Recognized Environmental Conditions (RECs). An REC is defined as the presence or likely presence of any hazardous substances or petroleum hydrocarbons on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum hydrocarbons into structures or into the ground, groundwater, or surface water of the subject property. Several of the following responses are based on the results of the ISA.

[20] Group Delta. 2019. *Initial Site Assessment Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project*. May 30.

The Project area conditions listed below are not considered RECs in the ISA but may require special handling:

- Historic use of the Project site includes agriculture, which is often associated with impacts from pesticide use. However, based on redevelopment of the Project area, former use of the site as agricultural land is not considered an REC.

- Utility poles exist along the Project alignment. The poles consist of creosote-treated wood, which consists of preserving chemicals that protect wood from insect predation and fungal decay during use.

- Several pole-mounted transformers were observed along Fairview Street. Historically, pole-mounted transformers have contained polychlorinated biphenyls (PCBs).

- Yellow striping exists along portions of Fairview Street. It is assumed that the striping contains lead and chromium.

- Materials associated with buildings and structures commonly contain hazardous materials.

3.9.2 Impact Analysis

a. Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant with Mitigation Incorporated. A significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials during the construction of the proposed Project could result from the improper handling or use of hazardous substances or an inadvertent release resulting from an unforeseen event (e.g., fire, flood, or earthquake). The severity of any such exposure is dependent upon the type, amount, and characteristic of the hazardous material involved; the timing, location, and nature of the event; and the sensitivity of the individual or environment affected.

Construction of the proposed Project will require the use of limited quantities of hazardous materials, such as fuels, oils, lubricants, and solvents. The small quantities of hazardous materials that would be transported, used, or disposed of would be well below reportable quantities. The improper use, storage handling, transport, or disposal of hazardous materials during construction could result in accidental release exposing construction workers, the public, and the environment, including soil and/or ground or surface water, to adverse effects. Construction activities would follow standard construction practices and applicable California Division of Occupational Safety and Health Administration, California Health and Safety Code, and other safety regulations to minimize the risk to the public. Compliance with federal, State, and local hazardous-materials laws and regulations would minimize the risk to the public and environment presented by these materials during construction of the proposed Project, such that no significant impacts would occur.

In addition, the removal of existing fill soil, utility poles and pole-mounted transformers, yellow traffic striping, wood waste, and hazardous building materials (e.g. asbestos and lead-based paint) would have the potential to create a significant hazard to the public or the environment. However, there are specific procedures for handling and disposing of these materials during demolition and renovation activities in the CCR and SCAQMD Rules and Regulations such that these materials do not adversely impact people or the environment. Mitigation Measure HAZ-1 cites compliance with these regulations as well as specific procedures to manage anticipated and unknown hazardous materials. Therefore, with implementation of Mitigation Measure HAZ-1, impacts associated with the transport or disposal of existing known or unknown hazardous materials in the Project area would be less than significant. Once operational, the proposed Project would not routinely generate, use, or dispose of hazardous materials. Impacts would be less than significant with mitigation incorporated.

b. Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less Than Significant Impact. The potential for releasing hazardous materials into the environment would primarily involve vehicles on the roadway, but could involve future subsurface contamination from nearby locations and off-site contaminated groundwater. This potential exists today and would not be substantially greater with roadway widening and bridge replacement. Vehicles and trucks may transport hazardous substances that could spill and impact the roadway, adjacent properties, or resources. However, transport of hazardous materials is subject to strict regulations established by local police and fire departments trained in emergency response procedures for safely responding to accidental spills of hazardous substances on public roads, which further reduces impacts. Therefore, Project impacts associated with hazards from reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment would be similar to existing conditions and are considered less than significant, and no mitigation is required.

c. Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less Than Significant with Mitigation Incorporated. The REACH Academy Community Day Intermediate and High School is located adjacent to the southern border of the Project site. As discussed in Section 3.3, Air Quality, the Project would not substantially increase the concentrations of hazardous materials in the area. As discussed in Response 3.9.2(a), above, construction of the proposed Project will require the use of limited quantities of fuels, oils, lubricants, and solvents. In addition, the removal of utility poles and pole-mounted transformers, yellow striping, wood waste, and building materials would have the potential to generate hazardous emissions. The Project would comply with local, State, and federal regulations with respect to the transport, use, and disposal of hazardous waste during construction activities and will comply with specific hazardous-materials procedures specified in Mitigation Measure HAZ-1. Once operational, the proposed Project would not generate hazardous emissions. Impacts would be less than significant with mitigation incorporated.

d. Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

No Impact. According to the Department of Toxic Substances Control EnviroStor database,[21] the Project site is not located on a federal Superfund site, State response site, voluntary-cleanup site, school cleanup site, evaluation site, school investigation site, military evaluation site, tiered permit site, or corrective-action site. In addition, the Project site is not included on the list of hazardous-materials sites compiled pursuant to Government Code Section 65962.5.[22] As a result, no impacts related to hazardous-materials sites would occur. No mitigation is required.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

No Impact. The closest airport to the Project site is the John Wayne Airport, which is located approximately 6.6 mi southeast of the Project site; however, the Project site is not located within the Airport Land Use Plan. The proposed Project's operation would be similar to the existing conditions. Because the Project area is not located within an Airport Land Use Plan, the proposed Project would not involve the introduction of residential or employment uses in the Project area, the proposed Project would not significantly change the roadway from existing conditions, and the proposed Project would result in no impacts related to aviation-related safety hazards or excessive noise for construction workers or travelers using the bridge or SART. No mitigation is required.

f. Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less Than Significant with Mitigation Incorporated. Fairview Street would remain open during the construction period (at least one lane with a pedestrian/bicyclist area); northbound and southbound traffic would be shifted to one side of the bridge while the other side is replaced. Access to properties would be maintained. However, construction activities may temporarily restrict local vehicular traffic, which could affect emergency response or evacuation. There are no local adopted emergency responses or emergency evaluation plans applicable to the Project area. A Traffic Management Plan (TMP) is needed to ensure that adequate emergency response and evacuation will be maintained. Mitigation Measure TR-1, provided later in Section 3.17, Transportation, requires that a TMP be developed during final design to address impacts to local circulation during construction, including emergency access. The TMP would require that emergency service providers be notified prior to Project construction regarding any temporary limitations to emergency access. Therefore, with implementation of Mitigation Measure TR-1, potential impacts to emergency response and evacuation plans during construction would be reduced to less than significant.

[21] California Department of Toxic Substances Control. 2019. *EnviroStor.* Website: www.envirostor.dtsc.ca.gov/public (accessed August 2019).

[22] California Environmental Protection Agency. 2019. *Government Code Section 65962.5(a).* Website: https://calepa.ca.gov/sitecleanup/corteselist/section-65962-5a/ (accessed August 2019).

g. Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less Than Significant Impact. According to the California Department of Forestry and Fire Protection, the Project site is within a designated Non Very High Fire Hazard Severity Zone (Non-VHFHSZ).[23] Construction of the proposed Project would be required to adhere to construction provisions in the City's Municipal Code. With adherence to development standards in the City's Municipal Code, there would be no impact associated with wildland fires, and no mitigation is required.

3.9.3 Mitigation Measures

Mitigation Measure HAZ-1 **Hazardous Materials Testing and Removal.** During Project design and construction, the Design Engineer and the Construction Contractor shall adhere to the requirements listed below. Documentation of compliance with these requirements shall be provided to the City of Santa Ana (City) Public Works Director or designee.

- Treated wood waste will either be disposed of as a hazardous waste or tested and handled in accordance with California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 34.
- If not tested for lead and chromium prior to removal, yellow traffic striping shall be managed consistent with California Department of Transportation (Caltrans) Standard Special Provision 14.11.12, *Remove Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue*, or the equivalent.
- Affected pole-mounted transformers will be removed by Southern California Edison personnel or qualified contractors.
- A hazardous building materials survey, including asbestos-containing materials and lead-based paint, will be conducted on the Fairview Street bridge, as well as any additional structures to be disturbed. Hazardous building materials will be removed and disposed of consistent with the South Coast Air Quality Management District (SCAQMD) Rules and Regulations and the California Health and Safety Code.
- Any suspect hazardous waste found during construction activities will be handled, treated, or disposed of consistent with local, State, and federal laws.

23 California Department of Forestry and Fire Protection. 2011. *Wildland Hazard and Building Codes*. November. Website: https://osfm.fire.ca.gov/divisions/wildfire-prevention-planning-engineering/wildland-hazards-building-codes/ (accessed August 2019).

3.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☒	☐	☐
i. Result in substantial erosion or siltation on- or off-site;	☐	☒	☐	☐
ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☒	☐	☐
iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☒	☐	☐
iv. Impede or redirect flood flows?	☐	☐	☒	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☒	☐	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐

3.10.1 Existing Setting

This section is based on the Water Quality Memorandum[24] (Appendix A), Location Hydraulic Study[25] (Appendix A), and River Hydraulics Analysis[26] (Appendix A) for the proposed Project.

3.10.1.1 Surface Waters

The Project area is within the Santa Ana River Watershed, which is within the jurisdiction of the Santa Ana RWQCB. The Santa Ana RWQCB jurisdiction is approximately 2,800 sq mi in portions of Orange, Riverside, and San Bernardino counties and mostly consists of the 2,650 sq mi Santa Ana River Watershed. Specifically, the Project area is within the Lower Santa Ana River Watershed, which extends from Prado Dam to the Pacific Ocean.

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24 LSA Associates, Inc. 2019e. *Water Quality Memorandum: Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project BRLS 5063(184)*. September 16.

25 Civil Works Engineers. 2019a. *Location Hydraulic Study. Santa Ana River Bridge at North Fairview Street. State Bridge No. 5063 (184)*. October.

26 Civil Works Engineers. 2019b. *River Hydraulics Analysis. Fairview Avenue Widening & Bridge Replacement Santa Ana, CA 91303.* October.

For regulatory purposes, the Santa Ana RWQCB designates watershed areas in Hydrologic Units (HUs), which are further divided into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). As designated by the Santa Ana RWQCB, the Project area is located within the Santa Ana River HU, the Lower Santa Ana River HA, and East Coast Plain HSA.[27]

The Santa Ana River extends approximately 96 mi from its headwaters to where it drains into the Pacific Ocean. The headwaters for the Santa Ana River and its tributaries originate in the San Gabriel, San Bernardino, and Santa Ana Mountains. From the San Bernardino and San Gabriel Mountains, the Santa Ana River flows through San Bernardino and Riverside Counties, then through the Prado Basin and a narrow pass in the Santa Ana Mountains. From the Santa Ana Mountains, the Santa Ana River flows southwesterly through Orange County to the Pacific Ocean. The Santa Ana River is divided into six reaches. The Fairview Street bridge crosses Reach 1 of the Santa Ana River, which is defined as the portion of the river between the tidal prism and 17th Street in Santa Ana. The Santa Ana River within the Project area is a concrete-lined, trapezoidal channel and is devoid of vegetation. Intermittent flows within the Santa Ana River can be attributed to storm water runoff, urban runoff, and treated wastewater.

3.10.1.2 Floodplains

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 0659C0144J,[28] the Santa Ana River within the Project area is designated Special Flood Hazard Area Zone A; such areas are subject to inundation by the 1 percent annual chance flood (100-year flood) with no base flood elevations determined. The remainder of the Project area (outside of the Santa Ana River) is designated as Other Areas of Flood Hazard Zone X; such areas have a reduced flood risk due to levee.

3.10.1.3 Groundwater Hydrology

The Project area is above the Coastal Plain of Orange County Groundwater Basin, which underlies the Lower Santa Ana River Watershed. The basin is bounded on the north by the Puente and Chino Hills, on the east by the Santa Ana Mountains, on the south by the San Joaquin Hills, on the southwest by the Pacific Ocean, and on the northwest by low topographic divide at approximately the Orange County–Los Angeles County line.[29]

For regulatory purposes, the Santa Ana RWQCB divides the Coastal Plain of Orange County Groundwater Basin into three Groundwater Management Zones. The Project area is within the Orange County Groundwater Management Zone.[30] The Orange County Groundwater Management Zone is bounded to the north by the Chino Hills, to the east by the Santa Ana Mountains, to the

27 Santa Ana Regional Water Quality Control Board. 1995. *Water Quality Control Plan, Santa Ana River Basin*. Updated 2008 and 2011.

28 United States Federal Emergency Management Agency. 2009. Flood Insurance Rate Map (FIRM) No. 0659C0144J. December 3.

29 California Department of Water Resources. 2004. *California's Groundwater, Bulletin* 118—*South Coast Hydrologic Region, Coastal Plain of Orange County Groundwater Basin*. February.

30 Santa Ana Regional Water Quality Control Board. 1995. op. cit.

southeast by SR-55, to the south by the Pacific Ocean, and to the northwest by the Orange County–Los Angeles County line.

Recharge to the Coastal Plain or to the Orange County Groundwater Basin occurs from percolation of Santa Ana River flow, infiltration of precipitation, and injection into wells.[31] A portion of the flow from the Santa Ana River directly below the Prado Dam is diverted to recharge groundwater.[32]

Based on exploratory boreholes drilled in 2003 and 2004, groundwater levels are 25 to 30 ft below ground surface.[33]

3.10.2 Impact Analysis

a. Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Less Than Significant with Mitigation Incorporated. Pollutants of concern during construction 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 water quality. During construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. According to the Draft Water Quality Management Plan (WQMP)[34] prepared for the proposed Project, the disturbed soil area during construction would be 1.15 ac. However, Project construction may disturb additional area depending on any sound barriers incorporated into the proposed Project. In addition, there is a potential for chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste to be spilled or leaked and transported via storm runoff into receiving waters.

Construction activities within the Santa Ana River during bridge replacement have the greatest potential to impact water quality. However, construction within the river would not occur during the rainy season. Activities above and within the river are anticipated to include demolition of the existing concrete bridge; saw cutting and removal of the concrete invert (i.e., the channel lining below the bridge); excavation (3 ft deep at the channel bottom and 6 ft deep at the abutments); pile driving; and installation of concrete for the pile caps, columns, and reconstructed invert. A potential temporary bicycle detour route may be constructed within the Santa Ana River channel. This potential detour route would be constructed and deconstructed during dry-season work within the channel. The detour route would have a dirt base with an asphalt surface and would be entirely removed prior to completion of construction.

Diversion of flows within the Santa Ana River is not anticipated to be required because construction activities would not take place within the low-flow portion of the channel. However, sandbags or concrete K-rails with plastic sheets may be required upstream of the work area to ensure that any

31 California Department of Water Resources. 2004. op. cit.

32 Santa Ana Regional Water Quality Control Board. 2004. *Watershed Management Initiative*. November.

33 Earth Mechanics, Inc. 2018. op. cit.

34 Civil Works Engineers. 2019b. op. cit.

water that escapes the low-flow channel is diverted back to the low-flow channel before reaching the construction area. A staging area would be located along the riverbank. No materials or equipment would be stored within the river channel.

Projects that disturb more than 1 ac of soil are subject to the requirements of the CGP. However, projects that disturb between 1 and 5 ac are potentially eligible for a Small Construction Rainfall Erosivity Waiver, which would exempt the project from coverage under the CGP. To obtain a waiver, a project would need to demonstrate that there would be no adverse water quality impacts, because construction activities would only take place when there is a low erosivity potential (i.e., the rainfall erosivity value in the Revised Universal Soil Loss Equation [R factor] for a project is less than 5). Based on a 2-year construction schedule, the R factor for the proposed Project would be approximately 38. Because of the two-year construction schedule, the R factor is well above 5, and the proposed Project would not qualify for a CGP erosivity waiver. Therefore, the proposed Project would be required to obtain coverage under and comply with the requirements of the CGP.

Based on the Risk Determination methodology outlined in the CGP, the Project has a low Sediment Risk (the relative amount of sediment that can be discharged, given the Project location and construction schedule—i.e., no work in the river during the wet season) and a low Receiving Water Risk (the risk sediment discharges pose to the receiving waters), which results in a combined Risk Level of 1 (low risk to water quality). Risk Level 1 projects are subject to the BMPs and visual inspection requirements of the CGP.

To prevent significant water quality impacts during ground-disturbance activities, the Project would need to prepare and implement a SWPPP that includes construction BMPs that comply with the requirements of the CGP. These requirements are included in Mitigation Measure HYDRO-1. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site, Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters, and Entrance Control BMPs to mitigate any tracking from the Project. Construction BMPs around the work area within the Santa Ana River are anticipated to include a gravel bag or fiber roll perimeter barrier to contain spills and potential runoff, to be installed and maintained year-round. Additional Construction BMPs would be determined during preparation of the SWPPP. When Construction BMPs are properly designed, implemented, and maintained to address pollutants of concern, as required in Mitigation Measure HYDRO-1, pollutants of concern would be retained on site so that they would not reach receiving waters; therefore, the project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant with mitigation incorporated.

Groundwater dewatering may be required during construction of the bridge piles to ensure that groundwater levels are below the pile cap elevation.[35] Release of dewatered groundwater to surface waters can introduce total dissolved solids and other constituents to surface waters. To prevent significant impacts to water quality associated with dewatering during construction, the Project would need to comply with the requirements of the De Minimus Permit. Mitigation Measure HYDRO-2 specifies compliance with this permit for groundwater dewatering. In compliance with this

[35] Earth Mechanics, Inc. 2018. op. cit.

permit, groundwater would be tested and treated (as necessary) prior to release to surface waters to ensure that discharges do not exceed water quality limits specified in the permit. Therefore, with implementation of Mitigation Measures HYDRO-1 and HYDRO-2, the proposed Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Therefore, impacts would be less than significant with mitigation incorporated.

Expected pollutants of concern during operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/viruses), pesticides, oil and grease, toxic organic compounds, and trash and debris. The pollutants of concern for the Project are metals and oil and grease. The proposed Project would increase impervious surface area by approximately 8,500 sf (approximately 0.2 ac), which would increase the volume of runoff during a storm and more effectively transport pollutants to receiving waters. In addition, an increase in impervious surface area would increase the total amount of pollutants in the storm water runoff, which would increase the amount of pollutants discharged to downstream receiving waters.

In order to avoid impacts to water quality during Project operation, the proposed Project would need to prepare and implement a Final (design-level) WQMP that specifies the Low Impact Development (LID) BMPs, Source Control BMPs, Site Design BMPs, and/or Treatment Control BMPs to be incorporated into Project design to reduce the discharge of pollutants of concern to the maximum extent practicable. LID BMPs mimic a project site's existing hydrology by using design measures that capture, filter, store, evaporate, detain, and infiltrate runoff, rather than allowing runoff to flow directly to piped or impervious storm drains. Source Control BMPs are preventative measures that are implemented to prevent the introduction of pollutants into storm water. Site Design BMPs are storm water management strategies that emphasize conservation and use of existing site features to reduce the amount of runoff and pollutant loading generated from a project site. Treatment Control BMPs are structural BMPs designed to treat and reduce pollutants in storm water runoff prior to release to receiving waters.

Currently, proposed BMPs include a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area. Additional treatment BMPs to treat runoff from the bridge deck may be incorporated into the bridge design at a later date during final design and will need to be sized to treat runoff from new impervious surface. According to the Draft WQMP prepared for the proposed Project, proposed nonstructural Source Control BMPs include right-of-way landscape management, right-of-way litter control, right-of way catch basin inspection, and street sweeping. Structural source control BMPs include use of efficient irrigation systems and landscape design, water conservation, smart controllers, and source control.

Mitigation Measure HYDRO-3 requires preparation of a Final WQMP that refines the BMPs during final design, consistent with the requirements above. The BMPs would target and reduce constituents of concern from transportation facilities in compliance with the North Orange County MS4 Permit requirements.

In addition, infiltration of storm water could have the potential to affect groundwater quality in areas of shallow groundwater. Pollutants in storm water are generally removed by soil through absorption as water infiltrates. Therefore, in areas of deep groundwater, there is more absorption potential and, as a result, less potential for pollutants to reach groundwater. Based on exploratory boreholes, groundwater levels are 25 to 30 ft below ground surface.[36] It is not expected that any storm water that may infiltrate during construction or operation would affect groundwater quality because there is not a direct path for pollutants to reach groundwater. Therefore, Project construction and operation would not violate any water quality standards or waste discharge requirements or substantially degrade groundwater quality. In addition, implementation of the proposed treatment BMPs would avoid any potential impacts to water quality before storm water would percolate into the groundwater basin. As such, when operational BMPs are implemented in accordance with NPDES Permit requirements as required by Mitigation Measure HYDRO-3, the Project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Impacts would be less than significant with mitigation incorporated.

b. *Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*

Less Than Significant Impact. The Project site is located within the Orange County Groundwater Basin, which is managed by the Orange County Water District. The Orange County Water District works to manage and protect groundwater in three main ways: recharge, monitor, and purify.[37] According to the Orange County Water District, the Orange County Groundwater Basin has a capacity of 500,000 acre-feet (af) and currently has 243,769 af remaining in storage.[38]

Groundwater dewatering during construction of the proposed Project may be required during construction of the bridge piles to ensure that groundwater levels are below the pile cap.[39] However, groundwater dewatering would be temporary, and the volume of groundwater removed would be minimal compared to the size of the groundwater basin. Therefore, Project construction would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin, and impacts would be less than significant.

The Project would increase impervious surface areas on site, which can decrease infiltration. However, due to the large amount of impervious surface area in the vicinity of the Project area and within the Santa Ana River channel, minimal infiltration would be expected to occur in the existing conditions. Additionally, the increase in impervious surface area of 8,500 sf (approximately 0.2 ac) is minimal compared to the size of the watershed and the amount of existing impervious surface area in the vicinity of the Project area. Therefore, the increase in impervious area would substantially interfere with groundwater recharge. In addition, operation of the proposed Project would not require groundwater extraction. Therefore, the proposed Project would not substantially decrease

36 Earth Mechanics, Inc. 2018. op. cit.

37 Orange County Water District. 2019a. *Groundwater Management.* Website: https://www.ocwd.com/what-we-do/groundwater-management/ (accessed October 2019).

38 Orange County Water District. 2019b. *Groundwater Storage Level August 2019.* Website: https://www.ocwd.com/media/8151/groundwater-storage-august-2019.pdf (accessed October 2019).

39 Earth Mechanics, Inc. 2018. op. cit.

groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin, and impacts would be less than significant.

c. *Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*

   i. *Result in substantial erosion or siltation on- or off-site*

Less Than Significant with Mitigation Incorporated. During construction activities, soil would be exposed and disturbed, drainage patterns would be temporarily altered during grading and other construction activities, and there would be an increased potential for soil erosion and siltation compared to existing conditions. Additionally, during a storm event, soil erosion and siltation could occur at an accelerated rate; however, no construction would occur in the river during storm events. As discussed above in Response 3.10.2(a), Mitigation Measure HYDRO-1 requires compliance with the CGP and preparation of a SWPPP to identify construction BMPs to be implemented as part of the proposed Project to reduce impacts to water quality during construction, including those impacts associated with soil erosion and siltation. Compliance with the CGP and implementation of the construction BMPs would ensure that construction impacts related to on- or off-site erosion or siltation would be reduced to less than significant with mitigation incorporated.

The proposed Project would increase impervious surface area on the Project site by approximately 0.2 ac compared to existing conditions, and could potentially increase on-site storm water runoff during a storm event. In the proposed condition, the impervious surface areas would not be prone to erosion or siltation. Erosion and siltation would be minimized in the landscaped areas, where soil would be stabilized by vegetation. Therefore, the proposed Project would not increase on-site erosion or siltation.

An increase in impervious surface area can potentially increase storm water runoff generated from a project and increase erosion and sedimentation in receiving waters. However, as discussed previously, the proposed Project would slightly increase the impervious surface area on the Project site compared to existing conditions (an increase of 0.2 ac), which would slightly increase the volume of storm water runoff generated from the Project site. However, post-construction BMPs would be implemented to treat new impervious surface runoff.

In addition, the Project includes BMPs that would reduce on-site erosion during storm events. Downstream erosion would not occur, as all pervious areas would be stabilized with landscaping and BMPs and the downstream conveyance channels that receive runoff from the Project area are engineered and hardened and not subject to erosion, siltation, or hydromodification (i.e., channel modification or channelization from alteration of flow).

The increase in impervious area would increase the volume of storm water runoff from the Project area into the Santa Ana River. However, the Santa Ana River is a stabilized concrete channel and is not susceptible to hydromodification.[40] Therefore, increasing flow to this channel would not change sediment transport or increase downstream erosion and accretion. In addition, the proposed Project would not alter the course of a stream or river. As such, operational impacts related to on-site or off-site erosion or siltation would be less than significant.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite

Less Than Significant with Mitigation Incorporated. During construction activities, soil would be exposed and disturbed, drainage patterns would be temporarily altered during grading and other construction activities, and there would be an increased potential for soil erosion and siltation compared to existing conditions. Additionally, during a storm event, soil erosion and siltation could occur at an accelerated rate. As discussed above in Response 3.10.2(a), Mitigation Measure HYDRO-1 requires compliance with the CGP and preparation of a SWPPP to identify construction BMPs to be implemented as part of the proposed Project to manage and convey storm water during construction. Proper management of storm water during construction would reduce impacts associated with flooding. Therefore, impacts related to on- or off-site flooding would be less than significant with mitigation incorporated.

Once operational, the proposed Project would improve the hydraulics of the Santa Ana River. As part of the bridge replacement, the proposed Project would replace eight existing pier walls within the Santa Ana River (totaling an area of 0.09 ac) with four new pier walls (totaling an area of 0.05 ac). In the existing condition, a hydraulic jump occurs upstream of the bridge (i.e., flows transition from supercritical to subcritical, which represents a high energy loss with erosive potential). The proposed Project would improve the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of the subcritical flows by approximately 300 ft. Therefore, implementation of the proposed Project would have a beneficial effect on the river hydraulics upstream of the Project area. Additionally, the proposed Project would maintain the overall drainage patterns in the Project area.

Therefore, implementation of the proposed Project would have a beneficial effect on the flood control functions of the surface waters upstream of the Project area. Additionally, the proposed Project would maintain the overall drainage patterns in the Project area. Therefore, the proposed Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site. As such, operational impacts related to on-site or off-site flooding would be less than significant.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff

Less Than Significant with Mitigation Incorporated. As discussed above in Response 3.10.2(a), there is a potential for chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste to be spilled or leaked and transported via storm runoff

[40] County of Orange. 2012b. op. cit.

into receiving waters. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. Drainage patterns would be temporarily altered during grading and other construction activities, and construction-related pollutants could be spilled, leaked, or transported via storm runoff into adjacent drainages and downstream receiving waters. However, as specified in Mitigation Measure HYDRO-1, the proposed Project would be required to comply with the requirements set forth by the CGP and SWPPP, which would specify BMPs to be implemented to control the discharge of pollutants in storm water runoff as a result of construction activities. Therefore, construction of the proposed Project would not create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Impacts would be less than significant with mitigation incorporated.

In addition, as discussed above in Response 3.10.2(a), expected pollutants of concern during operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/viruses), pesticides, oil and grease, toxic organic compounds, and trash and debris. The pollutants of concern for the Project are metals and oil and grease. The proposed Project would increase impervious area by approximately 8,500 sf (approximately 0.2 ac), which would increase the volume of runoff during a storm and more effectively transport pollutants to receiving waters. In addition, an increase in impervious surface would increase the total amount of pollutants in the storm water runoff, which would increase the amount of pollutants discharged to downstream receiving waters.

As required by Mitigation Measure HYDRO-3, a final WQMP would be prepared for the proposed Project that would require implementation of operational BMPs to reduce pollutants of concern in storm water runoff. With implementation of operational BMPs, no substantial additional sources of polluted runoff would be discharged to the storm drain system. As such, when operational BMPs are implemented in accordance with Mitigation Measure HYDRO-3, operation of the proposed Project would not create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Impacts would be less than significant with mitigation incorporated.

iv. Impede or redirect flood flows?

Less Than Significant Impact. As discussed previously, once operational, the proposed Project would improve the hydraulics of the Santa Ana River. As part of the bridge replacement, the proposed Project would replace eight existing pier walls within the Santa Ana River (totaling an area of 0.09 ac) with four new pier walls (totaling an area of 0.05 ac). In the existing condition, a hydraulic jump occurs upstream of the bridge (i.e., flows transition from supercritical to subcritical, which represents a high energy loss with erosive potential). The proposed Project would improve the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of the subcritical flows by approximately 300 ft. Therefore, implementation of the proposed Project would have a beneficial effect on the river hydraulics upstream of the Project area. Additionally, the proposed Project would maintain the overall drainage patterns in the Project area. Therefore, implementation of the proposed Project would not impede or redirect flood flows. This impact would be less than significant. No mitigation is required.

d. In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

Less Than Significant with Mitigation Incorporated.

Tsunami. Tsunamis are ocean waves generated by tectonic displacement of the sea floor associated with shallow earthquakes, sea floor landslides, rock falls, and exploding volcanic islands. Tsunamis can have wavelengths of up to 120 mi and travel as fast as 500 miles per hour (mph) across hundreds of miles of deep ocean. Upon reaching shallow coastal waters, the waves can reach up to 50 ft in height, causing great devastation to near-shore structures. The Project site is located approximately 9 mi from the Pacific Ocean shoreline and is not located within a tsunami inundation area. Therefore, the Project site is not subject to inundation from tsunamis, and there is no risk of release of pollutants due to inundation from tsunami.

Seiche Zones. Seiching occurs when seismic ground shaking induces standing waves (seiches) inside water retention facilities (e.g., reservoirs and lakes). Such waves can cause retention structures to fail and flood downstream properties. Because there are no large lakes, reservoirs, or other water retention facilities in the vicinity of the Project site, the Project site is not at risk of inundation from seiche. Therefore, the Project site is not subject to inundation from seiche waves, and there is no risk of release of pollutants due to inundation from seiche.

Flood Hazard. As identified above, the Santa Ana River within the Project area is designated Special Flood Hazard Area Zone A; such areas are subject to inundation by the 1 percent annual chance flood (100-year flood) with no base flood elevations determined. The remainder of the Project area (outside of the Santa Ana River) is designated as Other Areas of Flood Hazard Zone X; such areas have reduced flood risk due to levees. In the unlikely event of levee failure and flooding during a storm, there would be a risk of inundation and pollutant risk on the Project site. As discussed above in Response 3.10.2(a), during construction, there is a potential for chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste to be spilled or leaked and transported via storm runoff into receiving waters. Each of these pollutants on its own or in combination with other pollutants can have a detrimental effect on water quality. However, as specified in Mitigation Measure HYDRO-1, the proposed Project would be required to comply with the requirements set forth by the CGP and SWPPP, which would specify BMPs to be implemented to target and reduce pollutants of concern on the Project site.

In addition, as discussed above in Response 3.10.2(a), expected pollutants of concern during operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/viruses), pesticides, oil and grease, toxic organic compounds, and trash and debris. The pollutants of concern for the Project are metals and oil and grease. As required by Mitigation Measure HYDRO-3, a final WQMP would be prepared for the proposed Project that would require implementation of operational BMPs to reduce pollutants of concern in storm water runoff. With implementation of operational BMPs, no substantial additional sources of polluted runoff would be discharged. Because BMPs would reduce introduction of pollutants, there would be a low potential for pollutants to be released from the Project site in the unlikely event of levee failure and inundation of the Project site. Therefore, with implementation of Mitigation Measures HYDRO-1 and HYDRO-3, the proposed Project would not risk release of pollutants due to Project inundation. This impact would be less than significant with mitigation incorporated.

e. Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Less Than Significant Impact with Mitigation Incorporated. The proposed Project is within the jurisdiction of the Santa Ana RWQCB. The Santa Ana RWQCB adopted a Water Quality Control Plan (i.e., Basin Plan) that designates beneficial uses for all surface and groundwater within its jurisdiction and establishes the water quality objectives and standards necessary to protect those beneficial uses. As summarized below, the Project would comply with the applicable NPDES permits and would implement construction and operational BMPs to reduce pollutants of concern in storm water runoff.

As discussed in Response 3.10.2(a), during construction activities, excavated soil would be exposed, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. In addition, chemicals, liquid products, petroleum products (e.g., paints, solvents, and fuels), and concrete-related waste may be spilled or leaked and have the potential to be transported via storm water runoff into receiving waters. As specified in Mitigation Measure HYDRO-1, the proposed Project would be required to comply with the requirements set forth by the CGP, which require preparation of a SWPPP and implementation of construction BMPs to control storm water runoff and discharge of pollutants.

As discussed in Response 3.10.2(a), expected pollutants of concern during operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/viruses), pesticides, oil and grease, toxic organic compounds, and trash and debris. The pollutants of concern for the Project are metals and oil and grease. As required by Mitigation Measure HYDRO-3, a final WQMP would be prepared for the Project in compliance with the North Orange County MS4 Permit. The Final WQMP will detail the Site Design/LID, Source Control, and/or Treatment Control BMPs that would be implemented to treat storm water runoff and reduce impacts to water quality during operation. The proposed BMPs would capture and treat storm water runoff and reduce pollutants of concern in storm water runoff.

The proposed Project would comply with the applicable NPDES permit, which requires preparation of a SWPPP, preparation of a Final WQMP, and implementation of construction and operational BMPs to reduce pollutants of concern in storm water runoff. As such, the Project would not result in water quality impacts that would conflict with the Basin Plan. Impacts related to conflict with a water quality control plan would be less than significant, and no mitigation is required.

The Sustainable Groundwater Management Act (SGMA) was enacted in September 2014. SGMA requires governments and water agencies of high- and medium-priority basins to halt overdraft of groundwater basins. SGMA requires the formation of local Groundwater Sustainability Agencies

(GSAs), which are required to adopt Groundwater Sustainability Plans to manage the sustainability of the groundwater basins. SGMA provides authority for agencies to develop and implement groundwater sustainability plans (GSPs) or alternative plans that demonstrate the basin is being managed sustainably.

The Project site is located within the Coastal Plain of Orange County Groundwater Basin (Basin 8-1), which underlies the Lower Santa Ana River Watershed. For regulatory purposes, the Santa Ana RWQCB divides the Coastal Plain of Orange County Groundwater Basin into three Groundwater Management Zones. The Project area is within the Orange County Groundwater Management Zone. On January 1, 2017, the Orange County Water District, City of La Habra, and Irvine Ranch Water District submitted the Basin 8-1 Alternative to the California Department of Water Resources. The Basin 8-1 Alternative presents an analysis of basin conditions that demonstrates that Basin 8-1 has operated within its sustainable yield over a period of at least 10 years. In addition, the Basin 8-1 Alternative establishes objectives and criteria for management that would be addressed in a GSP and is designed to be “functionally equivalent” to a GSP. As shown in the Basin 8-1 Alternative, Basin 8-1 has been operated within its sustainable yield for more than 10 years without experiencing significant and unreasonable lowering of groundwater levels, reduction in storage, water quality degradation, seawater intrusion, inelastic land subsidence, or depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.[41]

As discussed in Response 3.10.2(a), with implementation of Mitigation Measures HYDRO-1 through HYDRO-3, the proposed Project would comply with the Construction General Permit and Municipal NPDES Permit and implement construction and operational BMPs to reduce impacts to water quality. The proposed Project’s adherence to the regulatory standards and implementation of BMPs would ensure that potential construction and operational impacts related to the degradation of water quality would be less than significant. Therefore, the proposed Project would not conflict with or obstruct implementation of a water quality control plan with implementation of Mitigation Measures HYDRO-1 through HYDRO-3. The proposed Project would not substantially deplete groundwater supplies or interfere with groundwater recharge; therefore, it would not obstruct or conflict with a sustainable groundwater management plan, and no mitigation is required.

3.10.3 Mitigation Measures

Mitigation Measure HYDRO-1 **Construction General Permit.** Prior to commencement of construction activities, the City of Santa Ana (City) Public Works Director or designee shall obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) NPDES No. CAS000002, Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ, or any other

41 Orange County Water District, City of La Habra, and Irvine Ranch Water District. 2017. *Basin 8-1 Alternative.* January 1. Website: https://www.ocwd.com/media/4918/basin-8-1-alternative-final-report-1.pdf (accessed November 2019).

subsequent permit. This shall include submission of Permit Registration Documents (PRDs), including permit application fees, a Notice of Intent (NOI), and other compliance-related documents required by the permit, to the State Water Resources Control Board via the Storm Water Multiple Application and Report Tracking System (SMARTS). Construction activities shall not commence until a Waste Discharge Identification Number (WDID) is obtained for the Project from SMARTS. Project construction shall comply with all applicable requirements specified in the Construction General Permit, including, but not limited to, preparation of a Storm Water Pollution Prevention Plan (SWPPP) and implementation of construction site best management practices (BMPs) to address all construction-related activities, equipment, and materials that have the potential to impact water quality for the appropriate risk level identified for the Project. The SWPPP shall identify the sources of pollutants that may affect the quality of storm water and shall include BMPs, such as Sediment Control, Erosion Control, and Good Housekeeping BMPs, to control the pollutants in storm water runoff. Construction Site BMPs shall also confirm to the requirements specified in the latest edition of the Orange County Stormwater Program Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed. Upon completion of construction activities and stabilization of the site, a Notice of Termination (NOT) shall be submitted via SMARTS.

Mitigation Measure HYDRO-2 **Groundwater Dewatering Permit.** If groundwater dewatering is required during construction, the City Public Works Director or designee shall ensure that the Construction Contractor obtains coverage under the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality (Order No. R8-2009-0003, NPDES No. CAG998001), or any subsequent permit. This shall include submission of a Notice of Intent (NOI) for coverage under the permit to the Santa Ana Regional Water Quality Control Board (RWQCB) at least 45 days prior to the start of dewatering. Groundwater dewatering activities shall comply with all applicable provisions in the permit, including water sampling, analysis, treatment (if required), and reporting of dewatering-related discharges. Upon completion of groundwater dewatering activities, an NOT shall be submitted to the Santa Ana RWQCB.

Mitigation Measure HYDRO-3 **Water Quality Management Plan.** During the final design phase, the City Public Works Director or designee shall insure that a Final Water Quality Management Plan (WQMP) be prepared for the Project in compliance with the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit or most recently adopted North Orange County MS4 Permit), Order R8-2009-0030, NPDES No. CAS618030 (as amended by Order No. R8-2010-0062). The Final WQMP shall be prepared consistent with the requirements of the Model WQMP and Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project WQMPs, or subsequent guidance manuals. The Final WQMP shall specify the BMPs to be incorporated into the Project design to target pollutants of concern in runoff from the Project area. The City Public Works Director or designee shall ensure that the BMPs specified in the Final WQMP are incorporated into the final Project design.

3.11 LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	☐	☐	☐	☒
b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

3.11.1 Existing Setting

The Project area is within Census Tracts 752.01 and 891.04 in Santa Ana, Orange County. Within the Project limits, Fairview Street is bordered by single-family residences, multi-family residences, and a few commercial properties.

3.11.2 Impact Analysis

a. Would the project physically divide an established community?

No Impact. The physical division of an established community typically refers to the construction of a feature, such as interstate highway, or the removal of a means of access, such as a local road, that would impair mobility within an existing community or between a community and outlying areas. For example, the construction of an interstate highway through an existing community may constrain travel from one side of the community to another; similarly, such construction may also impair travel to areas outside of the community. Development of the proposed Project would not create a physical barrier to travel within the Project area, as it would replace the existing Fairview Street bridge over the Santa Ana River, widen Fairview Street between 9th Street and 16th Street, and restripe the north and south ends to match the existing condition in Santa Ana. The proposed Project would improve accessibility and safety in the area for drivers, pedestrians, and bicyclists. As such, the proposed Project would not physically divide an established community, and no impacts would occur. No mitigation is required.

b. Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. Fairview Street is designated as a six-lane Major Arterial, as shown in the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element. Major Arterials are roadways designed to move large volumes of traffic, linking freeways with local streets and providing access between cities and subregions. The proposed improvements would maintain consistency with this six-lane Major Arterial designation in the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

The Circulation Element states that the City supports proactive integration of pedestrian-oriented improvements and amenities within the City's circulation system to improve walkability. The existing

Fairview Street includes sidewalks on both sides of the street, with the exception of the segment on the bridge. Fairview Street does not include any bicycle facilities, such as bicycle lanes. The proposed Project would construct a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting to provide safe walkability and bicycle accommodations across the bridge consistent with the goals and policies of the Circulation Element.

The Circulation Element also identifies Fairview Street as a planned widening project in Santa Ana. The proposed Project includes replacing the existing four-lane bridge with a new six-lane bridge. Therefore, the proposed Project is consistent with the goals and policies in the Circulation Element and does not conflict with any plans applicable to the Project area and the proposed Project. Therefore, the Project is consistent with any applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect, and no impacts would occur. No mitigation is required.

3.12 MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

3.12.1 Existing Conditions

In 1975, the California Legislature enacted the Surface Mining and Reclamation Act (SMARA), which, among other things, provided guidelines for the classification and designation of mineral lands. Areas are classified on the basis of geologic factors without regard to existing land use and land ownership. The areas are categorized into four Mineral Resource Zones (MRZs):

- **MRZ-1:** An area where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence
- **MRZ-2:** An area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence
- **MRZ-3:** An area containing mineral deposits, the significance of which cannot be evaluated
- **MRZ-4:** An area where available information is inadequate for assignment to any other MRZ

Of the four categories, lands classified as MRZ-2 are of the greatest importance. Such areas are underlain by demonstrated mineral resources or are located where geologic data indicates that significant measured or indicated resources are present. MRZ-2 areas are designated by the State Mining and Geology Board as being regionally significant. Such designations require that a lead agency's land use decisions involving designated areas are to be made in accordance with its mineral resource management policies and that it consider the importance of the mineral resource to the region or the State as a whole, not just to the lead agency's jurisdiction.

3.12.2 Impact Analysis

a. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The City's General Plan Conservation Element does not mention any mineral resources in the City.[42] In addition, the Orange County General Plan Resources Element does not identify the

42 City of Santa Ana. 1998a. *City of Santa Ana General Plan Conservation Element.* September 20.

Project area as a mineral resource zone.[43] No other City planning documents identify any locally important mineral resources in the vicinity of the proposed Project. The Project area is located within a developed urban area and does not support mineral extraction operations. Therefore, no impacts related to the loss of availability of a known mineral resource that would be of value to the region and the residents of the State would result from Project implementation. No mitigation is required.

b. Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

No Impact. As discussed above, the City's General Plan Conservation Element and the County's Resources Element do not identify any locally important mineral resources in the vicinity of the proposed Project. The proposed Project would not result in the loss of a locally important mineral resource. Therefore, no impacts related to the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan would result from Project implementation. No mitigation is required.

43 County of Orange. 2012a. *Orange County General Plan Chapter VI. Resources Element*.

3.13 NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

3.13.1 Existing Setting

This section is based on the Noise Study Report[44] (NSR; Appendix A) and Noise Abatement Decision Report (NADR; Appendix A)[45] prepared for the Project.

The City of Santa Ana addresses noise in the Noise Element of the General Plan[46] and in the Municipal Code.[47] The City's interior and exterior noise standards are shown in Table 3.13.A below. Section 18-314 in Article IV, Noise Control, of the City's Municipal Code states that construction activities are exempt from the City's noise standards provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays and Saturday, or any time on Sunday or a federal holiday.

Table 3.13.A: Interior and Exterior Noise Standards, dB CNEL

Category	Land Use Category	Interior[1]	Exterior[2]
Residential	Single-family, duplex, multifamily	45[3]	65
Institutional	Hospital, school classroom/playground	45	65
	Church, library	45	-
Open Space	Parks	-	65

[1] Interior areas (including but not limited to bedrooms, bathrooms, kitchens, living rooms, dining rooms, closets, corridors/hallways, private offices, and conference rooms).
[2] Exterior areas shall mean private yards of single-family homes, park picnic areas, school playgrounds, common areas, and private open space such as atriums on balconies, and shall be excluded from exterior areas provided sufficient common area is included within the project.
[3] Interior noise level requirements contemplate a closed-window condition. A mechanical ventilation system or other means of natural ventilation shall be provided per Chapter 12, Section 1305, of the Uniform Building Code.

44 LSA Associates, Inc. 2019c. *Noise Study Report*. January.
45 LSA Associates, Inc. 2019b. *Noise Abatement Decision Report.* June.
46 City of Santa Ana. 1998c. *City of Santa Ana General Plan Noise Element*. September 20.
47 City of Santa Ana. 2019b. op. cit.

3.13.1.1 Existing Noise-Sensitive Land Uses in the Project Area

Noise-sensitive receptors include residences, schools, hospitals, and similar uses that are sensitive to noise. Sensitivity to noise increases during the evening and at night. Noise-sensitive land uses located in the Project area are single-family and multifamily residences located adjacent to Fairview Street. Other non-noise-sensitive land uses located within the Project area include a medical office, a passive park (Fairview Triangle), a multiuse trail, vacant land, and commercial and light industrial uses. Recreational land uses in the Project area are not considered noise sensitive because there are no outdoor active-use areas where people would be regularly exposed to noise for an extended period of time.

3.13.1.2 Ambient Noise Levels

Short-term (20-minute) and long-term (24-hour) ambient noise measurements were conducted to document the existing noise environment in the Project vicinity. In total, 15 short-term measurement locations were conducted on April 17, 2018 and May 10, 2018, using Larson Davis Models 831, 824, and 820 Type 1 sound level meters. Table 3.13.B shows the results of these measurements and the descriptions of the physical locations of the noise monitoring sites. As shown in Table 3.13.B, daytime noise levels in the Project vicinity range from 50.0 to 74.0 A-weighted decibels equivalent continuous sound level (dBA L_{eq}).

Two long-term measurement sites were selected to capture the diurnal traffic noise level pattern in the Project area. Long-term ambient noise monitoring was conducted using one dosimeter at two representative locations in the Project area. The long-term noise level measurement at LT-1 was performed from 9:00 a.m. on Tuesday, April 17, 2018, to 9:00 a.m. on Wednesday, April 18, 2018, at a single-family residence at 1008 King Street. The noise levels ranged from 62 to 73 dBA L_{eq}. The long-term noise level measurement at LT-2 was performed from 2:00 p.m. on Wednesday, April 18, 2018, to 2:00 p.m. on Thursday, April 19, 2018, at a single-family residence at 2505 West 16th Street. The noise levels ranged from 57 to 67 dBA L_{eq}. Receptor locations are shown on Figure 5.

3.13.1.3 Existing Traffic Noise

The primary existing noise sources in the Project area are transportation facilities, which include Fairview Street. Traffic noise levels were predicted using the FHWA's Traffic Noise Model Version 2.5 (TNM 2.5).[48] Key inputs to TNM 2.5 were the locations of roadways, traffic mix, vehicle speeds, shielding features (e.g., topography and buildings), noise barriers, ground type, and receptors. The existing a.m. peak-hour traffic volumes obtained from the TIA[49] or the worst-case traffic operations (prior to speed degradation), whichever were lower, were coded into TNM 2.5 with existing roadway conditions. The a.m. peak-hour traffic volumes were selected over the p.m. peak-hour traffic volumes because the long-term (24-hour) noise level measurements indicate that the peak noise hour occurs during this period. A total of 92 receptor locations were modeled to represent land uses in the Project area as shown in Figure 5. Table B.1 in Appendix B of the NSR (Appendix A of this IS/MND) provides the results of the existing traffic noise modeling.

48 United States Federal Highway Administration. 2004. Traffic Noise Model (TNM) Version 2.5. April.

49 LSA Associates, Inc. 2018b. *Traffic Impact Analysis*. June.

Table 3.13.B: Ambient Noise Measurement Results

Monitor No.	Date	Start Time	Duration (minutes)	dBA L_{eq}	Location Description	Noise Sources
ST-1	4/17/2018	9:23 AM	20	63.4	2234 West 9th Street, in the residence backyard	Traffic on Fairview Street, birds, and rooster crowing
ST-2	4/17/2018	9:23 AM	20	63.8	2507 9th Street, in the residence backyard	Traffic on Fairview Street
ST-3	4/17/2018	9:23 AM	20	64.9	1908 King Street, in the residence backyard	Traffic on Fairview Street and birds
ST-4	4/17/2018	10:28 AM	20	67.3	1007 Marengo Place, in the residence backyard	Traffic on Fairview Street and birds
ST-5	4/17/2018	10:28 AM	20	65.6	2332 West 12th Street, in the residence backyard	Traffic on Fairview Street
ST-6	4/17/2018	11:36 AM	20	64.7	2503 West 12th Street, in the residence backyard	Traffic on Fairview Street
ST-7	5/10/2018	11:10 AM	20	66.7	Fairview Triangle	Traffic on Fairview Street, birds, and wind
ST-8	4/17/2018	10:28 AM	20	56.7	2413 West Washington Avenue, in the residence backyard	Traffic on Fairview Street
ST-9	4/17/2018	1:53 PM	20	55.7	1322 Fair Way, in the residence backyard	Traffic on Fairview Street
ST-10	4/17/2018	1:54 PM	20	53.3	1334 Fair Way, in the residence backyard	Traffic on Fairview Street
ST-11	4/17/2018	12:19 PM	20	50.0	1321 North Glenarbor Street, in the residence backyard	Traffic on Fairview Street
ST-12	4/17/2018	12:19 PM	20	54.5	1413 North Glenarbor Street, in the residence backyard.	Traffic on Fairview Street
ST-13	4/17/2018	1:12 PM	20	55.7	1417 North Glenarbor Street, in the residence backyard	Traffic on Fairview Street
ST-14	5/10/2018	12:10 PM	20	63.0	2501 16th Street, in the residence front yard	Traffic on Fairview Street and light traffic on 16th Street
ST-15	4/17/2018	1:12 PM	20	74.0	South of 1609 Fairview Street, in the residence front yard	Traffic on Fairview Street

Source: Compiled by LSA Associates, Inc. (May 2018).
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels
ST = short-term

3.13.2 Impact Analysis

a. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?'

Less Than Significant with Mitigation Incorporated.

Construction. Two types of short-term noise level increases would occur during construction of the proposed Project. The first type would be from construction crew commutes and the transport of construction equipment and materials to the Project area that would incrementally raise noise levels on access roads leading to the area. The pieces of heavy equipment for grading and construction activities would be moved on site, would remain for the duration of each construction phase, and would not add to the daily traffic volumes in the Project vicinity. A high single-event noise exposure potential at a maximum level of 84 dBA maximum instantaneous noise level (L_{max}) from trucks passing at 50 ft will exist. However, the projected construction traffic volume would be minimal when compared to existing traffic volumes on Fairview Street

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FIGURE 5

Sheet 1 of 2

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Modeled Noise Barrier and Receptor Locations

SOURCE: Google Aerial (12/2017); WKE (2017)

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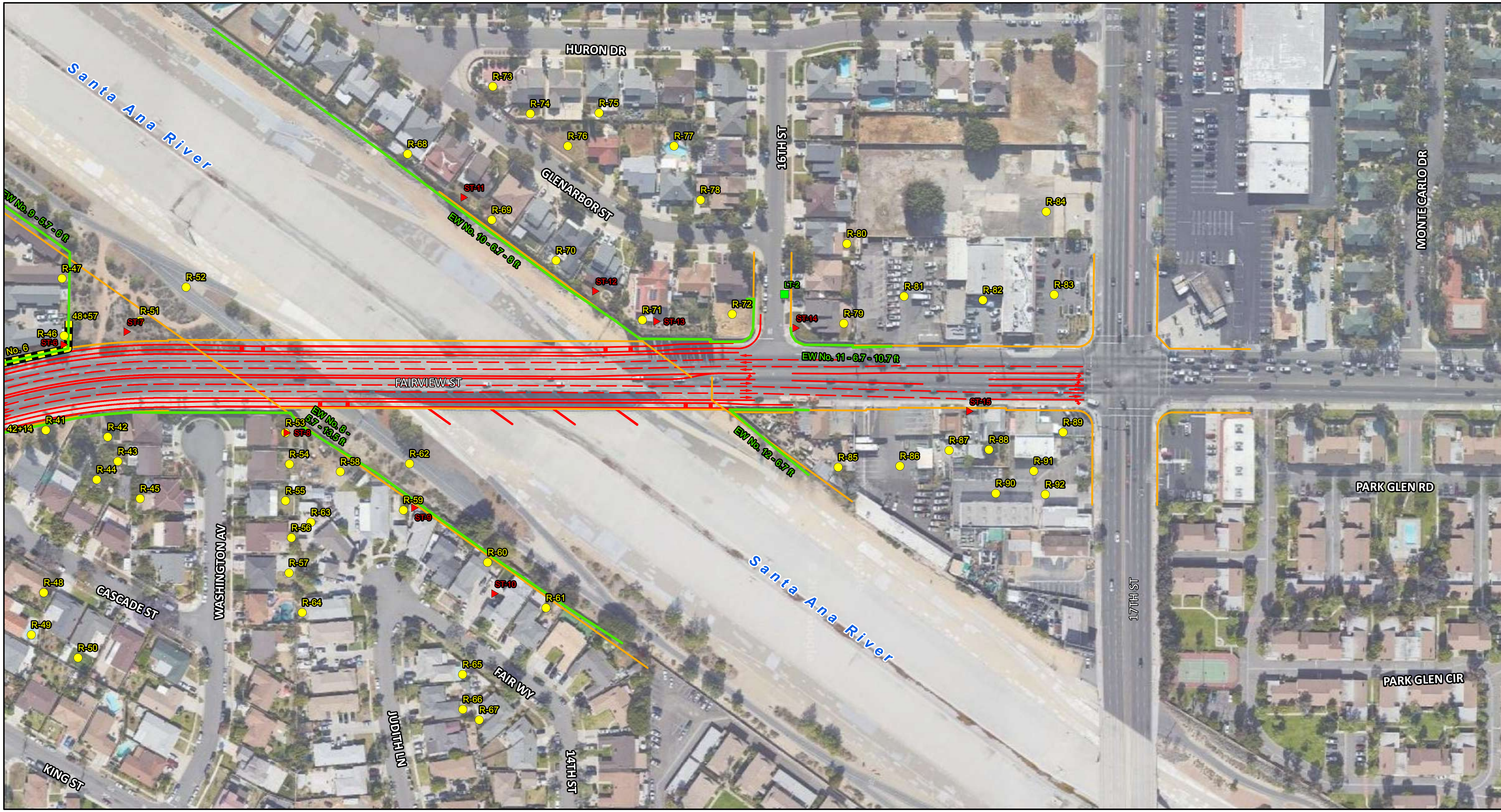

LEGEND

- Modeled Receptors
- Long-Term Monitoring Locations
- Short-Term Monitoring Locations
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls
- Potential Sound Barriers

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FEET

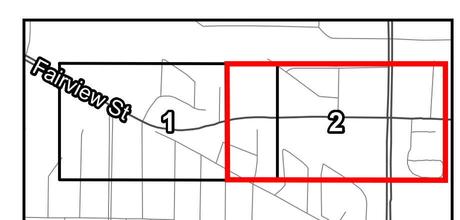

FIGURE 5
Sheet 2 of 2

Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project

Modeled Noise Barrier and Receptor Locations

SOURCE: Google Aerial (12/2017); WKE (2017)

I:\WKE1702\GIS\ISMND_MonLoc_ModReceptors.mxd (2/12/2020)

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and other adjacent roadways, and the associated long-term noise level change would not be perceptible above the existing ambient noise level. Therefore, short-term construction-related worker commutes and equipment transport noise level increases would not be substantial.

The second type of short-term noise impact is related to noise generated during roadway construction. Construction is performed in discrete 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 in the Project area 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 3.13.C lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments based on a distance of 50 ft between the equipment and a noise receptor.

Table 3.13.C: Typical Construction Equipment Noise Levels

Equipment Description	Spec 721.560[1] L_{max} at 50 ft (dBA)	Actual Measured[2] L_{max} at 50 ft (dBA)
Backhoes	80	78
Compactor (ground)	80	83
Cranes	85	81
Dozers	85	82
Dump Truck	84	76
Excavators	85	81
Flat Bed Trucks	84	74
Front-End Loaders	80	79
Graders	85	N/A[3]
Jackhammer	85	89
Pickup Truck	55	75
Pneumatic Tools	85	85
Pumps	77	81
Rock Drill	85	81
Roller	85	80
Scrapers	85	84
Tractors	84	N/A
Vibratory Pile Driver	95	101

Source: Federal Highway Administration *Roadway Construction Noise Model* (2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.

1 Maximum noise levels were developed based on Spec 721.560 from the CA/T program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

2 The maximum noise level was developed based on the average noise level measured for each piece of equipment during the CA/T program in Boston, Massachusetts.

3 Since the maximum noise level based on the average noise level measured for this piece of equipment was not available, the maximum noise level developed based on Spec 721.560 was used.

CA/T = Central Artery/Tunnel
dBA = A-weighted decibels
ft = foot/feet
L_{max} = maximum instantaneous noise level
N/A = not applicable
Spec = Specification

Typical noise levels at 50 ft from an active construction area range up to 88 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 excavating machinery (e.g., backfillers, bulldozers, and front loaders). Earthmoving and compacting equipment includes compactors, scrapers, and graders. 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.

Construction of the proposed Project is expected to require the use of graders, bulldozers, and water trucks/pickup trucks. Noise associated with the use of construction equipment is estimated to be between 55 and 85 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. As seen in Table 3.13.C, the maximum noise level generated by each grader is assumed to be approximately 85 dBA L_{max} at 50 ft from the grader in operation.

Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks/pickup trucks is estimated to be approximately 55 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 88 dBA L_{max} at a distance of 50 ft from an active construction area. Based on a usage factor of 40 percent, the worst-case combined noise level during this phase of construction would be 84 dBA L_{eq} at a distance of 50 ft from the active construction area.

The closest residences are located approximately 50 ft from the Project construction areas. Therefore, the closest residences may be subject to short-term noise reaching 88 dBA L_{max} generated by construction activities in the Project area. As identified above, construction noise is exempt from noise standards in the City's Municipal Code, but construction activities are limited to daytime periods—i.e., no construction activities between the hours of 8:00 p.m. and 7:00 a.m. on weekdays and Saturdays, or at any time on Sundays and federal holidays.[50] The Project is also subject to Caltrans Standard Specifications or Greenbook (2018 or most current) equivalent specifications because the Project would utilize federal transportation funding.

In addition to adherence to the City's Municipal Code construction activity time limits, standard noise controls are required to be implemented to avoid potentially significant construction noise impacts to adjacent residences. These controls include maintaining mufflers on equipment, directing stationary noise away from the nearest receptors, and staging equipment as far as possible from receptors. These controls, as well as compliance with the City's Municipal Code hour restrictions, are included in Mitigation Measure NOI-1. Therefore, with implementation of Mitigation Measure NOI-1, short-term noise impacts related to construction of the proposed Project would be less than significant.

50 City of Santa Ana. 2019b. op. cit.

Operation. Potential long-term noise impacts under the Future Plus Project condition are solely from traffic noise. Future traffic noise levels at all 92 receptor locations were determined using either the worst-case traffic operations (prior to speed degradation) or the 2040 a.m. peak-hour traffic volumes obtained from the TIA,[51] whichever were lower, as described above.

Long-term traffic noise impacts were evaluated based on the noise standards in the City's General Plan Noise Element. According to the Noise Element, the long-term operational noise standard for residential uses is 65 dBA Community Noise Level Equivalent (CNEL). A 3 dBA change is the lowest level that is barely perceptible by the average human ear in an outdoor environment. Under CEQA, a comparison is made between the Existing No Project and Future Plus Project noise levels. A receptor is considered significantly impacted under CEQA if an increase of 3 dBA or more occurs and the Future Plus Project traffic noise level is 65 dBA CNEL or more.

As shown in Table B.1 in Appendix B of the NSR (Appendix A of this IS/MND), the Project-related traffic noise increase (from Existing No Project to Future Plus Project) at all 92 modeled receptor locations would be less than 3 dBA and would not be perceptible to the human ear in an outdoor environment. Although noise level results from FHWA TNM 2.5 are described using the L_{eq} level and the City's noise standards are described using the CNEL level, the change in noise level from Existing No Project to Future Plus Project would be the same between the L_{eq} and CNEL. Therefore, long-term noise impacts related to operations of the proposed Project would be less than significant, and no mitigation is required.

The modeled future noise levels were also compared to the Caltrans Noise Abatement Criteria (NAC) to determine whether noise abatement should be considered under NEPA, because the Project would utilize federal transportation funding.

The following noise barriers (NBs) were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the Caltrans NAC for the future Project conditions:

- **NB No. 1:** A 169 ft long barrier along the right-of-way and private property line on the northbound side of Fairview Street between Civic Center Drive and 9th Street was analyzed to shield Receptor R-5.

- **NB No. 2:** A 129 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between Civic Center Drive and 9th Street was analyzed to shield Receptor R-8.

- **NB No. 3:** A 113 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptor R-14.

[51] LSA Associates, Inc. 2018b. op. cit.

- **NB No. 4:** A 171 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptor R-23.

- **NB No. 5:** A 705 ft long barrier along the right-of-way on the northbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptors R-24, R-25, and R-40.

- **NB No. 6:** A 184 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between West 12th Street and the Santa Ana River was analyzed to shield Receptor R-46.

Based on the NADR, NB Nos. 2 through 5 were determined to be reasonable, and NB Nos. 1 and 6 were determined to be not reasonable because the estimated construction cost exceeded the total reasonable allowance. NB Nos. 2, 3 (at 12 ft and 14 ft high), 4, and 5 would require the property owner to donate their right-of-way (permanent and temporary easement) in order to achieve reasonableness. The property owners and nonowner occupants were sent a noise barrier survey letter during the IS/MND public review period to request each owner's or occupant's opinion on whether or not they would prefer a noise barrier and what height they would prefer the barrier to be, based on the range of feasible and reasonable heights listed in Table 3.1 of the NADR (Appendix A of this IS/MND). NB No. 3 (at 14 ft high) was determined to be feasible and reasonable and would be constructed as part of the proposed Project.

b. Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact.

Construction. Construction of the proposed Project could result in the generation of groundborne vibration. This construction vibration impact analysis discusses the level of human annoyance using vibration levels in vibration velocity decibels (VdB) and will assess the potential for building damages using vibration levels in peak particle velocity (PPV, measured in inches per second [in/sec]) because vibration levels calculated in root-mean-square (RMS) are best for characterizing human response to building vibration, while vibration level in PPV is best used to characterize potential for damage. The Transit Noise and Vibration Impact Assessment[52] indicates that a vibration level up to 102 VdB (an equivalent to 0.5 in/sec in PPV) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a nonengineered-timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

52 United States Federal Transit Administration. 2018. *Transit Noise and Vibration Impact Assessment Manual*. September. Website: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf (accessed October 2019).

Table 3.13.D shows the PPV and VdB values at 25 ft from a construction vibration source. As shown in Table 3.13.D, bulldozers and other heavy-tracked construction equipment (except for pile drivers and vibratory rollers) generate approximately 87 VdB of groundborne vibration when measured at 25 ft, based on the Transit Noise and Vibration Impact Assessment. At this level, groundborne vibration would result in potential annoyance to residents and workers but would not cause any damage to the buildings.

Table 3.13.D: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 feet	
	PPV (in/sec)	L_V (VdB)[1]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] RMS in VdB is 1 µin/sec.
µin/sec = micro-inches per second
FTA = United States Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residences and commercial/office buildings in the Project vicinity). Outdoor site preparation for the proposed Project is expected to include the use of bulldozers and loaded trucks. The greatest levels of vibration are anticipated to occur during the site preparation phase. All other phases are expected to result in lower vibration levels. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the Project boundary (assuming the construction equipment would be used at or near the Project boundary) because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below:

$$L_v dB\ (D) = L_v dB\ (25\ ft) - 30\ Log\ (D/25)$$
$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

For typical construction activity, the equipment with the highest vibration generation potential is the large bulldozer, which would generate 87 VdB at 25 ft. The closest residences are located approximately 50 ft from the Project construction areas. Due to distance attenuation, the closest residences would experience vibration levels of up to 78 VdB (0.031 in/sec PPV), which is below the FTA threshold of 94 VdB (0.2 in/sec PPV) for building damage. Although construction vibration levels at the adjacent land uses would have the potential to result in annoyance, these vibration levels would no longer occur once construction of the proposed Project is completed.

Therefore, groundborne vibration and noise impacts generated by construction equipment would be less than significant. No mitigation measures are required.

Operation. Once operational, the proposed Project would generate a minimal amount of additional traffic, and regional traffic trips are expected to remain the same. Roads are not typically major sources of groundborne noise or vibration. Groundborne vibration is mostly associated with passenger vehicles and trucks traveling on roads with poor conditions (e.g., potholes, bumps, expansion joints, or other discontinuities in the road surface). Vibration effects of passenger vehicles and trucks (e.g., rattling of windows) are almost always a result of airborne noise.

The proposed Project would consists of asphalt pavement that was resurfaced in August 2018. As a result, there are no potholes, bumps, or other discontinuities in the road surface that would generate groundborne vibration or noise impacts from vehicular traffic traveling on Fairview Street. Therefore, groundborne vibration and noise impacts generated by vehicles traveling through the Project area would be less than significant. No mitigation is required.

c. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The closest airport to the Project site is John Wayne Airport, which is located approximately 6.6 mi southeast of the Project site; however, the Project site is not located within the Airport Land Use Plan. The proposed Project would not expose people residing or working in the Project area to excessive noise levels from aircraft noise because the Project site is located more than 2 mi from John Wayne Airport, the Project site is not located within an Airport Land use Plan, and the proposed Project would not involve the introduction of residential or employment uses in the Project area. There would be no impact, and no mitigation is required.

3.13.3 Mitigation Measures

Mitigation Measure NOI-1

Construction Noise Control. During construction, the Construction Contractor will implement the standard noise controls provided below and will adhere to City of Santa Ana (City) Municipal Code construction noise restrictions. The Construction Contractor will provide the City Public Works Director or designee with documentation that the following requirements were adhered to during construction activities:

- During all Project area excavation and on-site grading, the Project contractors will equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.

- The Project contractor will place all stationary construction equipment so that emitted noise is directed away from receptors nearest the Project area.

- The construction contractor will locate equipment staging in areas that will create the greatest distance between construction-related noise sources and receptors nearest the Project area during all Project construction.

- During all Project area construction, the construction contractor will limit all construction-related activities to the hours between 7:00 a.m. and 8:00 p.m. Monday through Saturday. No construction activities will be permitted outside of these hours or on Sundays or federal holidays.

3.14 POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

3.14.1 Existing Setting

The Project area is in Santa Ana. According to the 2012–2016 American Community Survey (ACS),[53] there were 333,605 people and 71,000 households in Santa Ana. Based on SCAG 2012 adopted growth estimates, the population of Santa Ana will reach 337,600 persons by 2020 and 336,700 persons by 2035, and will reach 73,900 households by 2020 and 74,800 households by 2035.[54]

3.14.2 Impact Analysis

a. Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed Project would include roadway improvements. The proposed Project would not result in direct population growth, as the use proposed is not residential and would not contribute to permanent residency on site as it would replace the existing Fairview Street bridge over the Santa Ana River, widening Fairview Street between 9th Street and 16th Street, and restriping the north and south ends to match the existing condition in Santa Ana. The proposed Project would not generate growth beyond that anticipated in the General Plan. Therefore, the proposed Project would not directly or indirectly induce population growth, and no impacts would occur. No mitigation is required.

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53 The ACS is an ongoing survey conducted by the United States 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 billion in federal and State funds are distributed each year. (Source: United States Census Bureau. 2019. About the American Community Survey. Website: https://www.census.gov/programs-surveys/acs/about.html [accessed November 2019].)

54 Southern California Association of Governments. 2012. Adopted 2012 RTP Growth Forecast. Website: http://gisdata.scag.ca.gov/Pages/SocioEconomicLibrary.aspx?keyword=Forecasting (accessed November 2019).

b. Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Less Than Significant Impact. The proposed Project would require one full acquisition of a residential property (two-family residence; APN 405-213-14) and partial right-of-way acquisition from two commercial parcels (APNs 405-213-02 and 405-213-01) along the north side of Fairview Street. Full acquisition of the residential property would be required, as the proposed road widening would result in the loss of a portion of the side yard. Full acquisition of the residence would displace all persons in the households. Based on the average persons-per-household data for the census tract in which the residence is located (Census Tract 752.01), full acquisition of the residence would result in the displacement of 11.56 persons. Based on a 4.8 percent vacancy rate for Santa Ana, there will be sufficient replacement residences that are equal to or better than the displacement property available for rent or purchase.

The two commercial parcels with partial acquisitions would not require business displacements or disruption to the current function of those properties. The proposed Project would not displace substantial numbers of existing people or housing, and no mitigation is required.

3.15 PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i. Fire protection?	☐	☒	☐	☐
ii. Police protection?	☐	☒	☐	☐
iii. Schools?	☐	☐	☐	☒
iv. Parks?	☐	☐	☐	☒
v. Other public facilities?	☐	☐	☐	☒

3.15.1 Existing Setting

Police protection services are provided to Santa Ana by the Santa Ana Police Department. The City's central police station is located at 60 Civic Center Plaza, and the City's substation is located at 3750 West McFadden Avenue. In addition, the police department maintains the Santa Ana Regional Transportation Public Safety Office and Jose Vargas Community Affairs Office. The closest police station to the Project site is the City's substation, located approximately 1.9 mi southwest of the Project site.

The City contracts fire department services with the Orange County Fire Authority (OCFA), which fulfills both fire protection and emergency medical responsibilities. The OCFA operates 10 stations throughout Santa Ana and has access to an additional 61 stations in its service area. These stations are well distributed, with approximately 1.5 mi service radii throughout Santa Ana. However, the overlapping responsibility of fire companies allows adequate response to emergencies. The first fire unit response goal (travel time) is less than 5 minutes. The closest fire station to the Project site is OCFA-Santa Ana Fire Station #71, located at 419 S. Franklin Street, approximately 1.4 mi southeast of the Project site.

The Project area between 9th Street and the Fairview Street bridge is in the Santa Ana Unified School District (SAUSD) service area, and the Project area between Fairview Street bridge and 17th Street is in the Garden Grove Unified School District (GGUSD) service area. SAUSD serves transitional-kindergarten through 12th-grade children with 36 elementary schools, 9 intermediate schools, 6 comprehensive high schools, 3 educational options secondary schools, 2 early college high schools, and 1 early learner childhood education special-needs development center.[55]

[55] Santa Ana Unified School District. 2019. *District Overview.* July 11. Website: https://www.sausd.us/domain/3 (accessed August 2019).

Approximately 48,000 students are enrolled in SAUSD schools.[56] SAUSD serves transitional-kindergarten through 12th-grade children with 48 preschools and elementary schools, 10 intermediate schools, 8 high schools, 2 special-education schools, 1 adult education school, and 1 career technical education school.[57] Approximately 43,300 students are enrolled in GGUSD schools.[58] The closest schools to the Project site include the REACH Academy Community Day Intermediate and High School located adjacent to the southern border of the Project site.

Library services are provided at the Santa Ana Public Library, Newhope Library Learning Center, Garfield Community Center, Roosevelt-Walker Community Center, and Jerome Community Center.[59] The closest library services to the Project site are provided at the Jerome Community Center, located approximately 1.5 mi south of the Project site.

Parks and recreational facilities in the vicinity of the Project area include the SART and Fairview Triangle, a trailside rest area with native plant restoration, seating, and interpretive signage.

3.15.2 Impact Analysis

a. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*

   i. *Fire protection?*

   Less Than Significant with Mitigation Incorporated. The proposed Project would not result in any new land uses that would require fire protection. Fairview Street is currently used by the OCFA to access land uses in this part of Santa Ana. The proposed Project would reduce congestion along Fairview Street. No long-term road closures and no closures during peak travel hours are anticipated through the Project area during construction of the proposed improvements, and at least one through-traffic lane in each direction would be kept open at all times. However, construction activities may temporarily restrict local vehicular traffic, which could affect emergency response or evacuation. A TMP is needed to ensure that adequate emergency response and evacuation will be maintained. Mitigation Measure TR-1, provided later in Section 3.17, Transportation, requires that a TMP be developed during final design to address impacts to local circulation during construction, including emergency access. The TMP would require that emergency service providers be notified prior to Project construction regarding any temporary limitations to emergency access. Therefore, with implementation of

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56 Santa Ana Unified School District. 2019. *District Overview.* July 11. Website: https://www.sausd.us/domain/3 (accessed August 2019).

57 Garden Grove Unified School District. 2019. *Which School Will My Child Attend?* Website: https://www.ggusd.us/schools/#elementary (accessed August 2019).

58 Ibid.

59 City of Santa Ana. 2019a. *Library Services.* Website: https://www.santa-ana.org/library (accessed August 2019).

Mitigation Measure TR-1, potential impacts to emergency response and evacuation plans during construction would be reduced to less than significant.

The proposed Project is anticipated to improve traffic along Fairview Street once the improvements are operational. Therefore, the completed Project should have a beneficial impact on emergency services response times in the Project area and vicinity. The proposed Project would not generate demand for fire protection, and no additional or expanded facilities would be needed. Therefore, impacts to emergency services related to fire protection would be less than significant with mitigation incorporated.

ii. Police protection?

Less Than Significant with Mitigation Incorporated. As discussed under Response 3.14.2(a)(i) above, the proposed Project would result in improvements to an existing roadway and would not result in any new land uses that would require police protection. Fairview Street is currently used by the Santa Ana Police Department to access land uses in this part of Santa Ana. The proposed Project would reduce congestion along Fairview Street. No long-term road closures and no closures during peak travel hours are anticipated through the Project area during construction of the proposed improvements, and at least one through-traffic lane in each direction would be kept open at all times. However, construction activities may temporarily restrict local vehicular traffic, which could affect emergency response or evacuation. A TMP is needed to ensure that adequate emergency response and evacuation will be maintained. Mitigation Measure TR-1, provided later in Section 3.17, Transportation, requires that a TMP be developed during final design to address impacts to local circulation during construction, including emergency access. The TMP would require that emergency service providers be notified prior to Project construction regarding any temporary limitations to emergency access. Therefore, with implementation of Mitigation Measure TR-1, potential impacts to emergency response and evacuation plans during construction would be reduced to less than significant.

The proposed Project is anticipated to improve traffic operations along Fairview Street once the improvements are operational. The proposed Project would not generate demand for police protection, and no additional or expanded facilities would be needed. Therefore, impacts to emergency services related to police protection would be less than significant with mitigation incorporated.

iii–v. Schools, Parks and Other Public Facilities?

No Impact. The proposed Project would not generate an increase in population and, therefore, would not result in the need for new or expanded school facilities, parks, or libraries. As discussed in in Section 3.16, Recreation, the Project would not alter the function of the SART or Fairview Triangle during construction or operation. Therefore, there would be no Project-related impact to schools, parks, or libraries. No mitigation is required.

3.16 RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

3.16.1 Existing Setting

Recreational facilities in the vicinity of the Project area include the SART and Fairview Triangle. The SART is a Class I bike path that runs on the east side of the Santa Ana River. Fairview Triangle is a trailside rest area with native plant restoration, seating, and interpretive signage. Although Fairview Triangle provides some function as a passive park, the primary purpose of the site is a rest area with native plant restoration.

3.16.2 Impact Analysis

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Less Than Significant Impact. The purpose of the proposed Project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street. Currently, the Fairview Street bridge is utilized by bicyclists and pedestrians to cross over the Santa Ana River, but there are no existing sidewalks or bikeways on the bridge. As part of the proposed Project, the Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. These features would improve the safety of the area for both motorized and nonmotorized travel. The improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways, which could facilitate access to the park by nonmotorized travel; however the proposed Project would not induce population or employment growth that would generate a significant increased demand for recreational facilities. Therefore, the proposed Project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Impacts would be less than significant, and no mitigation is required.

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less Than Significant Impact. As discussed above, the purpose of the proposed Project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and

16th Street. Currently, the Fairview Street bridge is utilized by bicyclists and pedestrians to cross over the Santa Ana River, but there are no existing sidewalks or bikeways on the bridge. As part of the proposed Project, the Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. These features would improve the safety of the area for both motorized and nonmotorized travel. The improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways, which could facilitate access to the park by nonmotorized travel; however the Project does not include recreational facilities or require the construction or expansion of recreational facilities because it involves bridge replacement, roadway widening, and restriping. Impacts would be less than significant, and no mitigation is required.

3.17 TRANSPORTATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b. Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)	☐	☐	☒	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d. Result in inadequate emergency access?	☐	☒	☐	☐

3.17.1 Existing Setting

The analysis in this section is based on the TIA[60] (Appendix A), which summarizes the intersection LOS calculations using the intersection capacity utilization (ICU) methodology for signalized intersections and Highway Capacity Manual (HCM) methodology for unsignalized intersections, consistent with the City's Circulation Element and *Capacity Calculations and Level of Service Standards*. The traffic analysis analyzes the existing (2017) condition and future year (2021 and 2040) No Project and Plus Project conditions for the proposed Project.

The City's Circulation Element and the Orange County Transportation Authority Master Plan of Arterial Highways (MPAH) identify Fairview Street between Civic Center Drive and 17th Street (including a bridge over the Santa Ana River) as a six-lane, divided Major Arterial. The bridge currently provides two lanes in each direction. The segment of Fairview Street to the north of 16th Street currently provides two lanes in each direction, with the exception of a three-lane southbound segment between Avalon Avenue and Bolivar Circle. Fairview Street south of 9th Street currently provides three lanes in each direction. Fairview Street has a posted speed limit of 45 mph on segments north and south of the bridge.

Sidewalks exist on both sides of Fairview Street, with the exception of the segment on the bridge. Bicycle facilities, such as bicycle lanes, do not exist on Fairview Street; however, the SART runs along the Santa Ana River's eastern bank and has access points to both the northbound and the southbound sides of Fairview Street at the southern end of the bridge. The trail on the Santa Ana River's western bank does not have direct connections to Fairview Street.

Consistent with the intersection analysis methodology, existing intersection LOS was calculated for the five study intersections. To calculate the daily roadway LOS, existing daily traffic volumes along the roadway segments between the study intersections were compared against the design capacities of each segment. The City considers LOS D to be the upper limit of satisfactory

60 LSA Associates, Inc. 2018b. op. cit.

intersection operations. Table 3.17.A depicts existing intersection LOS, while Table 3.17.B shows roadway segment LOS.

Table 3.17.A: Existing Intersection LOS Summary

Intersection		2017 Existing Conditions			
		AM Peak Hour		PM Peak Hour	
		v/c Delay	LOS	v/c Delay	LOS
1	Fairview Street/17th Street	0.835	D	0.902	E
2	Fairview Street/16th Street[1]	31.6	D	20.0	C
3	Fairview Street/12th Street[1]	25.1	D	19.0	C
4	Fairview Street/9th Street[1]	>50.0	F	47.4	E
5	Fairview Street/Civic Center Drive	0.642	B	0.640	B

= unsatisfactory LOS

[1] The intersection is unsignalized and was assessed using the HCM methodology. Delay values shown are in seconds per vehicle.

>50.0 = HCM delay value is greater than 50.0 seconds per vehicle, LOS F.
HCM = Highway Capacity Manual
LOS = level of service
v/c = volume-to-capacity ratio

Table 3.17.B: Existing ADT Volumes and LOS

Roadway Segment		2017 Existing Conditions			
		Arterial Type	Capacity	ADT	LOS
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,440	F
	16th Street to 12th Street–Fairview Bridge	4 Lanes Undivided	25,000	41,890	F
	12th Street to 9th Street	4 Lanes Divided	37,500	40,980	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	41,720	C

= unsatisfactory LOS
ADT = average daily traffic
LOS = level of service
v/c = volume-to-capacity

As Table 3.17.A shows, the intersections of Fairview Street/17th Street and Fairview Street/9th Street currently operate at unsatisfactory LOS E or worse during one or both peak hours. The three other study intersections currently operate at satisfactory LOS D or better. As shown in Table 3.17.B, the segments of Fairview Street (including the bridge) that provide only four lanes of travel currently experience daily traffic volumes greater than their respective design capacities, meaning these roadway segments currently experience unsatisfactory LOS F.

3.17.2 Impact Analysis

a. Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less Than Significant with Mitigation Incorporated. Construction of the proposed Project may require temporary closure of one travel lane at a time on the bridge, which would temporarily delay local vehicular traffic and could affect travelers on Fairview Street. In addition, construction of the proposed Project would require temporary closure of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of the SART affected by Project construction would need to be temporarily closed four times for approximately 8 hours each during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured, and signage would be provided to display the dates of the closures and identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours.

On May 16, 2018, a coordination meeting was held in order to discuss the potential SART closures required by the proposed Project. Attendees included staff from the City, Caltrans, and OC Parks as well as the Project engineer and environmental consultant. The detour plan was revised based on OC Parks input. In addition, requirements for SART closures, including warning signs and flagmen, were noted and have been included as part of the proposed Project. As discussed at the meeting, details regarding the bike detours would be coordinated with OC Parks during construction at least 30 days prior to the temporary closure of the SART so that OC Parks can also provide the closure information on its website. Other short-term closures of up to 15 minutes would be allowed with flagmen.

Potential impacts to travelers on Fairview Street or the SART in the Project area during construction would be avoided or minimized with development and implementation of a TMP that identifies how the safe movement of vehicular, pedestrian, and bike traffic would be safely handled during construction, including signage and bike detour routes and coordination with OC Parks. Mitigation Measure TR-1 requires that a TMP be prepared during final design and implemented during construction. Therefore, with implementation of Mitigation Measure TR-1, construction activities would not conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

In addition, LSA prepared future traffic forecasts for 2021 baseline (No Project) and Plus Project conditions as well as 2040 No Project and Plus Project conditions using the long-range traffic modeling tool, the Orange County Transportation Analysis Model (OCTAM). OCTAM is a travel demand model derived from SCAG's Regional Model that provides more specific land use and network information for Orange County. The 2021 baseline traffic forecasts represented the anticipated conditions at the anticipated Project completion year. The 2040 traffic forecasts represent long-range design year traffic conditions. Due to Project development delays, the current projected opening year is 2022.

The 2021 No Project and Plus Project traffic forecasts were developed based on interpolating the overall growth between existing (2017) volumes and 2040 No Build and Build forecasts. Specifically, the proportional growth from 2017 to 2021 (4 years) was scaled against the overall growth between 2017 and 2040 (23 years) to develop a growth ratio of 17.39 percent. This growth percentage was applied to the growth between 2017 and 2040 forecasts at each study intersection and roadway segment to arrive at 2021 No Build and Plus Project traffic forecasts.

The future year No Project conditions (2021 and 2040) are the baselines for analyzing the impacts associated with the Project itself (i.e., beyond that attributed to growth/cumulative projects).

2021 No Project Condition. As shown in Table 3.17.C, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS E during the p.m. peak hour)
- Fairview Street/9th Street (LOS F in both the a.m. and p.m. peak hours)

This represents a general worsening of intersection operations under 2021 No Project condition.

Table 3.17.C: 2021 Intersection LOS

	Intersection	2017 Existing Condition				2021 No Project Condition				2021 Plus Project Condition			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS
1	Fairview Street/ 17th Street	0.835	D	0.902	E	0.853	D	0.954	E	0.860	D	0.948	E
2	Fairview Street/ 16th Street[1]	31.6	D	20.0	C	33.9	D	20.7	C	>50.0	F	27.2	D
3	Fairview Street/ 12th Street[1]	25.1	D	19.0	C	26.0	D	19.7	C	22.1	C	18.0	C
4	Fairview Street/ 9th Street[1]	>50.0	F	47.4	E	>50.0	F	>50.0	F	>50.0	F	41.4	E
5	Fairview Street/ Civic Center Drive	0.642	B	0.640	B	0.664	B	0.651	B	0.691	B	0.665	B

= unsatisfactory LOS

[1] The intersection is unsignalized and was assessed using the HCM methodology. Delay values shown are in seconds per vehicle.

>50.0 = HCM delay value is greater than 50.0 seconds per vehicle, LOS F.
HCM = Highway Capacity Manual
LOS = level of service
v/c = volume-to-capacity ratio

As shown in Table 3.17-D, forecasted increases to daily traffic volumes along Fairview Street from existing to 2021 No Project condition are anticipated to continue to result in unsatisfactory roadway segment LOS for the four-lane segments of Fairview Street.

2021 Plus Project Condition. As shown in Table 3.17.C, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS E during the p.m. peak hour)
- Fairview Street/16th Street (LOS F during the a.m. peak hour)
- Fairview Street/9th Street (LOS F during the a.m. peak hour and LOS E in the p.m. peak hour)

Several of the study intersections are shown to operate at higher levels of delay or capacity compared to the 2021 No Project condition because of the rerouting of regional north-south vehicular traffic from parallel routes that may now use Fairview Street due to the proposed improvements. Exceptions include the intersections of Fairview Street at 17th Street and

Table 3.17.D: 2021 ADT Volumes and Roadway Segment LOS

Roadway Segment		Arterial Type	Capacity	ADT	LOS
2017 Existing Condition					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,440	F
	16th Street to 12th Street–Fairview Bridge	4 Lanes Undivided	25,000	41,890	F
	12th Street to 9th Street	4 Lanes Divided	37,500	40,980	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	41,720	C
2021 No Project Condition					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,910	F
	16th Street to 12th Street–Fairview Bridge	4 Lanes Undivided	25,000	42,350	F
	12th Street to 9th Street	4 Lanes Divided	37,500	41,430	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	42,180	C
2021 Plus Project Condition					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	43,620	F
	16th Street to 12th Street–Fairview Bridge	6 Lanes Divided	56,300	43,050	C
	12th Street to 9th Street	6 Lanes Divided	56,300	42,110	C
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	42,880	C

= unsatisfactory LOS
ADT = average daily traffic
LOS = level of service
v/c = volume-to-capacity ratio

12th Street, which operate better due to reductions in travel patterns (higher north-south through traffic, while lower east-west turning movements at 17th Street) and changes in access (12th Street).

Implementation of the proposed Project would result in prolonged delay for the eastbound left-turn movements at the intersection of Fairview Street at 16th Street. This represents a worsening of access conditions to 9 a.m. and 5 p.m. peak-hour conditions. As this resulting deficient operation is indicative of only the worst-performing movement (the eastbound left-turning vehicles in the p.m. peak hour), this delay value and LOS are not considered to be indicative of the overall intersection and are not considered a significant impact.

As Table 3.17.D shows, the proposed increase in roadway capacity to Fairview Street south of 16th Street is anticipated to accommodate both ambient existing to 2021 traffic growth and north-south regional traffic rebalancing at satisfactory LOS C. This is an improvement over both existing and 2021 No Project overcapacity traffic conditions. In addition, as shown in Table 3.17.D, Fairview Street from 17th Street to 16th Street would continue to result in unsatisfactory LOS F conditions. However, this segment is outside the Project limits. As described earlier, the City's General Plan Circulation Element identifies Fairview Street as a 6-lane Major Arterial Highway, including the segment between 17th Street and 16th Street. Implementation of additional lanes within this roadway segment, consistent with the General Plan, would eliminate the roadway deficiency. As part of its annual Capital Improvement Program (CIP), the City conducts ongoing monitoring and collects citywide traffic data for all arterials and intersections within the City. As part of this ongoing monitoring, the City determines needed improvements and prioritizes projects for funding to address identified congestion and/or safety concerns. The segment of Fairview Street between 17th Street and 16th Street is already identified as roadway link of concern.

2040 No Project Condition. As shown in Table 3.17.E, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS F in both the a.m. and p.m. peak hours)
- Fairview Street/16th Street (LOS E during the a.m. peak hour)
- Fairview Street/9th Street (LOS F in both a.m. and p.m. peak hours)

Table 3.17.E: 2040 Intersection LOS

	Intersection	2017 Existing Condition				2040 No Project Condition				2040 Plus Project Condition			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS
1	Fairview Street/ 17th Street	0.835	D	0.902	E	1.071	F	1.258	F	1.031	F	1.195	F
2	Fairview Street/ 16th Street[1]	31.6	D	20.0	C	48.1	E	24.9	C	>50.0	F	41.7	E
3	Fairview Street/ 12th Street[1]	25.1	D	19.0	C	32.0	D	23.4	C	30.6	D	22.3	C
4	Fairview Street/ 9th Street[1]	>50.0	F	47.4	E	>50.0	F	>50.0	F	>50.0	F	>50.0	F
5	Fairview Street/ Civic Center Drive	0.642	B	0.640	B	0.766	C	0.705	C	0.908	E	0.876	D

= unsatisfactory LOS
[1] The intersection is unsignalized and was assessed using the HCM methodology. Delay values shown are in seconds per vehicle.
>50.0 = HCM delay value is greater than 50.0 seconds per vehicle, LOS F.
LOS = level of service
v/c = volume-to-capacity ratio

This represents a general worsening of intersection operations under 2040 No Project condition.

As shown in Table 3.17.F, forecasted increases to daily traffic volumes along Fairview Street from existing to 2040 No Project condition are anticipated to continue to result in unsatisfactory roadway segment LOS for the four-lane segments of Fairview Street.

2040 Plus Project Condition. As shown in Table 3.17.E, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS F during both the a.m. and the p.m. peak hours)
- Fairview Street/16th Street (LOS F during the a.m. peak hour and LOS E during the p.m. peak hour)
- Fairview Street/9th Street (LOS F during both the a.m. and the p.m. peak hours)
- Fairview Street/Civic Center Drive (LOS E during the a.m. peak hour)

Similar to the analysis results for the 2021 Plus Project condition, several of the study intersections are shown to operate at higher levels of delay or capacity under the 2040 Plus Project condition, compared to the 2040 No Project condition, because of the rerouting of regional north-south vehicular traffic from parallel routes that may now use Fairview Street

Table 3.17.F: 2040 ADT Volumes and Roadway Segment LOS

Roadway Segment		Arterial Type	Capacity	ADT	LOS
2017 Existing Condition					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,440	F
	16th Street to 12th Street–Fairview Bridge	4 Lanes Undivided	25,000	41,890	F
	12th Street to 9th Street	4 Lanes Divided	37,500	40,980	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	41,720	C
2040 No Project Condition					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	45,130	F
	16th Street to 12th Street–Fairview Bridge	4 Lanes Undivided	25,000	44,540	F
	12th Street to 9th Street	4 Lanes Divided	37,500	43,580	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	44,360	C
2040 Plus Project Condition					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	49,200	F
	16th Street to 12th Street–Fairview Bridge	6 Lanes Divided	56,300	48,560	D
	12th Street to 9th Street	6 Lanes Divided	56,300	47,510	D
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	48,360	D

= unsatisfactory LOS
ADT = average daily traffic
LOS = level of service
v/c = volume-to-capacity

due to the proposed improvements. Exceptions include the intersections of Fairview Street at 17th Street and 12th Street, which operate better due to reductions in travel patterns (higher north-south through traffic while lower east-west turning movements at 17th Street) and changes in access (12th Street).

The intersection of Fairview Street at 16th Street experiences a worsening of HCM-based delay values in the 2040 p.m. peak hour from an acceptable 24.9 second/vehicle LOS C in the No Project condition to an unacceptable 41.7 second/vehicle LOS E in the Plus Project condition. This represents the calculated delay of the worst-performing movement in a given intersection and is not indicative of the experience of the majority of vehicles traveling through these intersections. As this resulting additional deficient operation is indicative of only the worst-performing movement, in this case the 5 eastbound left-turning vehicles in the p.m. peak hour, this delay value and LOS are not considered to be indicative of the overall intersection and are not considered a significant impact.

Implementation of the proposed Project would result in an additional unsatisfactorily operating intersection (the intersection of Fairview Street and Civic Center Drive) compared to the deficient intersections identified under the 2040 No Build condition. Regional growth between the existing and 2040 No Project conditions would contribute to the unacceptable peak-hour operations at the intersection of Fairview Street at Civic Center Drive which could potentially result in a significant impact.

As shown in Table 3.17.F, the proposed increase in roadway capacity for Fairview Street south of 16th Street is anticipated to accommodate 2040 traffic growth and north-south regional traffic rebalancing resulting in satisfactory LOS D. This is an improvement over both existing and 2040 No Project overcapacity traffic conditions. In addition, as shown in Table 3.17.F, Fairview Street from 17th Street to 16th Street would continue to result in unsatisfactory LOS F conditions. However, this segment is outside the Project limits. As described earlier, the City's General Plan Circulation Element identifies Fairview Street as a 6-lane Major Arterial Highway, including the segment between 17th Street and 16th Street. Implementation of additional lanes within this roadway segment, consistent with the General Plan, would eliminate the roadway deficiency. As discussed above, as part of its annual CIP, the City conducts ongoing monitoring and collects citywide traffic data for all arterials and intersections within the City. As part of this ongoing monitoring, the City determines needed improvements and prioritizes projects for funding to address identified congestion and/or safety concerns. The segment of Fairview Street between 17th Street and 16th Street is already identified as roadway link of concern.

The proposed improvement of Fairview Street from four through lanes to six through lanes could result in a significant impact at the intersection of Fairview Street and Civic Center Drive in the 2040 Plus Project a.m. peak-hour conditions. In order to mitigate the potentially impacted a.m. peak-hour condition, the intersection would need to be restriped to allow additional movements—specifically, restriping the westbound shared left-through lane to allow right turns as well (a shared left-through-right-turn lane).

The allowance of westbound right turns from the westbound shared left-through turn lane is anticipated to improve the 2040 Plus Project condition a.m. peak-hour intersection v/c ratio from a deficient 0.908 (LOS E) to an acceptable 0.842 (LOS D). The 2040 Plus Project condition p.m. peak-hour intersection v/c ratio is anticipated to improve from an acceptable 0.876 (LOS D) to an acceptable 0.810 (LOS D). As this impact and deficiency are not anticipated to occur until the 2040 Plus Project condition, it is recommended that this improvement not be implemented until deemed necessary. This should be done through intersection operations monitoring (particularly of the westbound right-turn movement) by City staff. The requirement to monitor this intersection and to implement the intersection modification when warranted is included in Mitigation Measure TR-2.

Unsignalized Queuing Analysis. To determine the necessary turn pocket lengths at the intersections of Fairview Street/16th Street and Fairview Street/9th Street that would be affected by the proposed Project, LSA conducted an HCM-based queuing analysis for the 2040 Plus Project traffic condition. Table 3.17.G shows the results of this queuing analysis.

Table 3.17.G: 2040 Plus Project Fairview Street Turn Pocket Queuing

Intersection	Movement	Existing Pocket Length (ft)	95th percentile queue (ft)[1]	
			AM Peak Hour	PM Peak Hour
Fairview Street/16th Street	Northbound Left	50	<25	<25
Fairview Street/9th Street	Northbound Left	55	33	38
	Southbound Left	95	48	<25

[1] Queue length is based on a design vehicle length of 25 ft. Queue lengths of less than one vehicle are noted as "<25" to signify that a minimum of one vehicle length of queueing storage should be provided.

ft = foot/feet

Because the existing intersection geometrics have storage lengths that exceed the calculated queue lengths, modifications to existing pocket lengths are not necessary to accommodate 2040 Plus Project traffic queues.

Pedestrian and bicyclist facilities along Fairview Street that currently exist on both sides of the bridge but not on the bridge itself would be connected by sidewalks and Class II bike lanes that are part of the proposed Project. The closure of this gap in the pedestrian network would benefit pedestrians traveling between destinations north of 17th Street, such as Leroy L. Doig Intermediate School, Samueli Academy, the Stater Bros. Market, the residential community south of the Santa Ana River and the Fairview Triangle park.

With implementation of Mitigation Measure TR-2, which will address the projected deficiency at the intersection of Fairview Street and Civic Center Drive, Project operation would not conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. Impacts would be less than significant with mitigation incorporated.

b. Would the project conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?

Less Than Significant Impact. CEQA Guidelines section 15064.3 was certified and adopted in December 2018. Section 15064.3 provides that VMT is the most appropriate metric to assess transportation impacts. Other relevant considerations may include a project's effects on transit and nonmotorized travel. Section 15064.3, subdivision (b) further provides that transportation projects that reduce VMT should be presumed to cause a less-than-significant impact. For roadway capacity projects, a lead agency has "discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements." Based on CEQA Guidelines section 15064.3, VMT analysis will be required Statewide beginning July 1, 2020.

Consistent with CEQA Guidelines section 15064.3, the City adopted new Local Guidelines for Implementing the California Environmental Quality Act in June 2019, which included a requirement for a quantitative analysis of VMT associated with a transportation project that adds capacity. However, a quantitative analysis of Project-generated VMT was not conducted as the transportation analysis for this project was prepared prior to June 2019. As such, a qualitative analysis of potential VMT impacts associated with the proposed Project is provided below.

The purpose of the proposed Project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element. Currently, the Fairview Street bridge is utilized by bicyclists and pedestrians to cross over the Santa Ana River, but there are no existing sidewalks or bike lanes on the bridge or bike lanes between 9th Street and 16th Street. As part of the Project, the Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting and Class II bike lanes would be added between 9th Street and 16th Street. These features would improve the safety of the area for both motorized and nonmotorized travel.

Because the Project would add lane capacity to the Fairview Street bridge, some traffic currently using other routes would use a widened Fairview Street bridge, which would increase VMT in the area. On the other hand, the improved bridge may attract additional pedestrians and bicyclists due to added sidewalks and bikeways. Therefore, the proposed project would support nonmotorized travel. As such, the proposed Project would not conflict or be inconsistent with *State CEQA Guidelines* section §15064.3, subdivision (b). Impacts would be less than significant, and no mitigation is required.

c. Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact. The Project segment of Fairview Street bridge and the SART do not currently include hazardous design features, and operations of those facilities do not include any incompatible uses. The proposed Fairview Street bridge and SART modifications would be designed and constructed consistent with applicable CBC and Caltrans seismic design standards and would not include hazardous design features or incompatible uses. The construction of the proposed improvements would be completed with materials consistent with standard City requirements. Therefore, construction and operation of the proposed Project would not increase hazards due to a design feature or incompatible uses. This impact would be less than significant, and no mitigation is required.

d. Would the project result in inadequate emergency access?

Less Than Significant with Mitigation Incorporated. There are no hospitals, fire stations, or police stations on the Project segment of the Fairview Street bridge. However, Fairview Street provides a direct north-south route across the Santa Ana River in Santa Ana. Construction of the proposed Project would require temporary closure of one travel lane at a time on the bridge, which would temporarily delay local vehicular traffic and could temporarily affect emergency responders. Coordination with emergency responders with respect to reducing delays and identifying detour routes would avoid significant impacts with regards to emergency access. This requirement is included as part of the TMP specified in Mitigation Measure TR-1. Therefore, with implementation of Mitigation Measure TR-1, the proposed Project would not result in inadequate emergency access.

3.17.3 Mitigation Measures

Mitigation Measure TR-1

Transportation Management Plan. During the construction phase, the Construction Contractor shall be required to submit a TMP to the City of Santa Ana (City) Director of Public Works, or designee, for review and approval. During construction, the City Director of Public Works, or designee, shall require the Construction Contractor to adhere to all requirements of the Traffic Management Plan (TMP). The TMP shall include the following:

- Notices of lane closures in local media and posted on the City's website.

- Advance notice to the public and local emergency service providers regarding the timing, location, and duration of construction activities.

- Procedures for coordination with OC Parks to ensure appropriate bicycle/pedestrian detour routes and ensure appropriate signage is provided to display the dates of the closures and to identify the detour routes

- Procedures for coordination with emergency service providers to minimize temporary delays in emergency response times. Such coordination could include the identification of alternative routes for emergency vehicles and routes across the construction area.

Mitigation Measure TR-2

Fairview Street/Civic Center Drive Intersection LOS Monitoring. As part of the City's annual review of its Capital Improvement Program, the City Traffic Engineer will evaluate the function of the intersection of Fairview Street and Civic Center Drive to ensure that it operates at adequate level of service (LOS). If LOS is deficient, the City will restripe the westbound shared left-through turn lane to a shared left-through-right turn lane.

3.18 TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k) or	☐	☐	☐	☒
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

3.18.1 Existing Setting

Assembly Bill (AB) 52, which became law on January 1, 2015, provides for consultation with California Native American tribes during the CEQA environmental review process, and equates significant impacts to "tribal cultural resources" with significant environmental impacts. PRC Section 21074 states that tribal cultural resources are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are one of the following:

- Included or determined to be eligible for inclusion in the California Register of Historical Resources.
- Included in a local register of historical resources as defined in subdivision (k) of PRC Section 5020.1.
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

A "historical resource" (PRC Section 21084.1), a "unique archaeological resource" (PRC Section 21083.2(g)), or a "nonunique archaeological resource" (PRC Section 21083.2 (h)) may also be a tribal cultural resource if it is included or determined to be eligible for inclusion in the California Register. The consultation provisions of the law require that a public agency consult with local Native American tribes that have requested placement on that agency's notification list for CEQA projects. Within 14 days of determining that a project application is complete, or a decision by a public agency to undertake a project, the lead agency must notify tribes of the opportunity to consult on the project, should the tribes have previously requested to be on the agency's notification list. California Native American tribes must be recognized by the NAHC as traditionally and culturally affiliated with the project site and must have previously requested that the lead agency notify them of projects. Tribes have 30 days following notification of a project to request consultation with the lead agency.

The purpose of consultation is to inform the lead agency in its identification and determination of the significance of tribal cultural resources. If a project is determined to result in a significant impact on an identified tribal cultural resource, the consultation process must occur and conclude prior to adoption of a Negative Declaration or Mitigated Negative Declaration, or certification of an Environmental Impact Report (PRC Sections 21080.3.1, 21080.3.2, 21082.3).

3.18.2 Impact Analysis

a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k) or
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

No Impact. The City submitted letters on April 11, 2018, notifying California Native American tribes traditionally and culturally affiliated with the Project area and vicinity about the proposed Project. No tribes requested consultation pursuant to PRC Section 21080.3.1. Because no responses were received from California Native American tribes, the proposed Project would not cause a substantial adverse change in the significance of a tribal cultural resource. No impacts would occur. The correspondence related to tribal cultural resources defined in PRC Section 21074 is included in Appendix A.

Handling of previously unknown cultural resources or human remains discovered during construction is subject to State regulatory requirements and is included in Mitigation Measures CULT-1 and CULT-2, respectively.

3.19 UTILITIES AND SERVICE SYSTEMS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☒	☐	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d. Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

3.19.1 Existing Setting

The Project area is subject to the requirements of the Santa Ana RWQCB and is served by the Irvine Ranch Water District Company. Electric services for Santa Ana are provided by Southern California Edison, and the Southern California Gas Company provides the natural gas services. An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. The water service provider in the Project area is Santa Ana Municipal Utility Works. The phone service providers in the Project area include AT&T U-Verse and Time Warner Cable. The closest landfill to the Project area is the Frank R. Bowerman Landfill, located in Orange County, approximately 14.4 mi east of the Project area.

3.19.2 Impact Analysis

a. Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less Than Significant with Mitigation Incorporated. Potential impacts related to the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects, are discussed below.

Water and Wastewater. The 12-inch water line that cross the Santa Ana River, suspended under the deck of the existing bridge, would be temporarily relocated during construction and then permanently relocated to the new bridge, which could halt water service for approximately 3 hours. Although standard construction procedures would be employed to avoid accidents or excessive disruptions to water service, there is a potential for an extended loss of water service. Any relocation of water facilities would occur during the construction phase such that water services are permanently maintained. To avoid any significant impacts to water service or other utilities during the construction phase, coordination with utility providers and completion of an updated utility search to determine utility conflicts that would require protection in-place or relocation are necessary. Any modifications to utility facilities are required to be coordinated with the applicable utility provider to minimize the risk of disruption of services and damage to the facilities, to ensure advance notification of any temporary service disruptions to the public, and to protect the safety of the construction workers and the general public. These requirements are specified in Mitigation Measures UTL-1 and UTL-2. Therefore, with implementation of Mitigation Measures UTL-1 and UTL-2, the relocation or construction of new water facilities would not cause significant environmental effects.

The proposed Project would not result in any new land uses that would consume water or generate wastewater. Water would be used during construction to reduce fugitive dust in compliance with SCAQMD Rules 402 and 403 and during operation for landscape irrigation. Landscaping would include native trees and low-water-use shrubs along Fairview Street, which would not demand a substantial increase in water used for irrigation in comparison to existing conditions in the Project area. The amount of water used during construction and operation would be minimal, and water use during construction would cease when construction is completed. No wastewater would be generated as a result of construction or operation of the proposed Project.

Stormwater Drainage. The proposed Project would improve the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of the subcritical flows by approximately 300 ft. Therefore, implementation of the proposed Project would have a beneficial effect on the flood control functions of the surface waters upstream of the Project area. A 60-inch storm drain exists from 17th Street to the northwest corner of the bridge, which has an outlet and drains into the Santa Ana River. However, the proposed Project would avoid impacting the storm drain outlet into the Santa Ana River. Additionally, the proposed Project would maintain the overall drainage patterns in the Project area and would not substantially increase the rate or amount of surface runoff in a manner that would result in on-site or off-site flooding. Therefore, the proposed Project would not result in the need for new storm water drainage facilities or the expansion of existing facilities.

Electric Power and Natural Gas. As discussed in Response 3.6.2(a), energy usage on the Project site during construction would be temporary in nature and would be relatively small in comparison to available energy sources. Once operational, the proposed Project would not require the consumption of natural gas. Electric power associated with the proposed Project would only be associated with minimal electricity consumption associated with lighting along the Project segment. As such, implementation of the proposed Project would not result in a long-term substantial demand for electric power and natural gas. However, there is the potential for relocation of one or more utility poles along the Project alignment. Any modifications to utility poles are required to be coordinated with the applicable utility provider to minimize the risk of disruption of services and damage to the facilities, to ensure advance notification of any temporary service disruptions to the public, and to protect the safety of the construction workers and the general public. These requirements are specified in Mitigation Measures UTL-1 and UTL-2. Therefore, with implementation of Mitigation Measures UTL-1 and UTL-2, the proposed Project would not require or result in the relocation or construction of new or expanded electric power or natural gas facilities, the construction of which could cause significant environmental effects.

Telecommunication Facilities. The bank of 12 phone conduits that cross the Santa Ana River over the Santa Ana River would be temporarily relocated during construction and then permanently relocated to the new bridge. Telecommunication disruptions would generally not exceed 3 hours. As discussed above, Mitigation Measure UTL-1 requires coordination with utility providers during the construction phase, and Mitigation Measure UTL-2 requires conducting an updated utility search to determine all utility conflicts that would require protection in-place or relocation. Therefore, with implementation of Mitigation Measures UTL-1 and UTL-2, the relocation or construction of new or expanded telecommunications facilities would not cause significant environmental effects.

Summary. With implementation of Mitigation Measures UTL-1 and ULT-2, the proposed Project would not require or result in the relocation or construction of new or expanded facilities for water, wastewater treatment, storm drainage, electric power, natural gas, or telecommunications, the construction of which could cause significant environmental effects. Therefore, impacts would be less than significant with mitigation incorporated.

b. Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

No Impact. Refer to Response 3.19.2(a), above. As discussed in that response, water use during construction and operation would be minimal, and water supplies for construction activities would be temporary in nature, ceasing upon construction completion. In addition, the minor increase in water use during operation for irrigation would not require additional entitlements or resources. Therefore, construction and operation of the proposed Project would have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years, and no impact would occur. No mitigation is required.

c. Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. No wastewater would be generated as a result of construction or operation of the proposed Project. Therefore, the proposed Project would not result in a determination by the wastewater treatment provider that serves or may serve the proposed Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments, and no impact would occur. No mitigation is required.

d. Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact. The proposed Project would generate construction waste that would require disposal in local landfills. The closest landfill to the Project site is the Frank R. Bowerman Landfill, which is currently permitted to operate until December 2053 and has a remaining capacity of 205,000,000 cubic yards.[61] The maximum permitted daily capacity of the landfill is 11,500 tons per day. In addition, there is additional recycling capacity for the generated construction/demolition materials at the following facilities: Ewles Materials, All American Asphalt, Tierra Verde Industries, and Sunset Environmental in Irvine, and Madison Materials in Santa Ana. Therefore, these landfills would provide adequate waste disposal services in accepting construction waste generated by the proposed Project. Construction waste would be recycled as appropriate. Waste collected during road maintenance associated with operation of the proposed Project would be limited and would be similar to the amount of waste collected during maintenance of the existing roadway. The proposed Project would not generate solid waste in excess of State or local standards or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals during construction or operation. Therefore, a less-than-significant impact would occur. No mitigation is required.

e. Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact. Waste generated during construction of the proposed Project would be limited to construction debris (e.g., concrete, rebar, and vegetation associated with clearing and grading, and with the widening of Fairview Street and replacement of the bridge) and would not generate an excessive amount of solid waste that would exceed the capacity of the Frank R. Bowerman Landfill. Construction waste would be disposed of in accordance with federal, State, and local regulations related to recycling, including the California Integrated Waste Management Act of 1989 (AB 939). Operation of the completed Project would generate very limited waste material. Specifically, waste collected during maintenance would be collected and disposed of consistent with City policies. Therefore, the proposed Project would comply with all federal, State, and local statutes and regulations related to solid waste, and no impact would occur. No mitigation is required.

3.19.3 Mitigation Measures

Mitigation Measure UTL-1 **Coordination with Utility Providers.** During the construction phase, the Construction Contractor will coordinate with utility service providers in the area to minimize the risk of disruption of services and damage to any utility facilities present within the disturbance limits, to ensure advance notification of any temporary service disruptions to the public, and to protect the safety of the construction workers and the general public.

61 OC Waste & Recycling. *Frank R. Bowerman Landfill*. Website: http://www.oclandfills.com/landfill/active/bowerman (accessed August 2019).

Mitigation Measure UTL-2 **Updated Utility Survey.** During the design phase, the Project Engineer will provide the City of Santa Ana (City) Director of Public Works, or designee, with an updated utility survey to update information on known utility facilities as well as previously unidentified/unknown or new utility facilities within the disturbance limits.

3.20 WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b. Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☒
c. Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d. Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

3.20.1 Existing Setting

Wildland fires occur in geographic areas that contain the types and conditions of vegetation, topography, weather, and structure density susceptible to risks associated with uncontrolled fires that can be started by lightning, improperly managed camp fires, cigarettes, sparks from automobiles, and other ignition sources. According to the California Department of Forestry and Fire Protection, the Project site is within a designated Non-VHFHSZ.[62] The project is not located in or near state responsibility areas.

3.20.2 Impact Analysis

a. Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact. The proposed Project is anticipated to improve traffic along Fairview Street once the improvements are operational. Therefore, the completed Project should have a beneficial impact on emergency response and evacuation in the Project area and vicinity. Moreover, since the Project area is not located in or near a VHFHSZ nor is it located in or near a State Responsibility Area, potential impacts associated with emergency response or evacuation would not pertain to wildfire and would more likely be associated with an urban fire or other emergency situations. Therefore, operation of the proposed Project would not substantially impair an adopted emergency response plan or emergency evacuation plan. There would be no impact, and no mitigation is required.

62 California Department of Forestry and Fire Protection. 2011. op. cit.

b. Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

No Impact. As stated previously, the Project area is not located in or near a VHFHSZ nor is it located in or near a State Responsibility Area. Therefore, the proposed Project would not exacerbate wildfire risks due to slope and prevailing winds, thereby exposing Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. There would be no impact, and no mitigation is required.

c. Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

No Impact. Utility modifications and the proposed roadway improvements would not exacerbate fire risk due to the location of the Project in an urban area outside of a designated fire hazard zone. Therefore, the proposed Project would not require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that would exacerbate fire risk or result in temporary or ongoing impacts to the environment. There would be no impact, and no mitigation is required.

d. Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact. Landslides and other forms of mass wasting, including mud flows, debris flows, and soil slips, occur as soil moves downslope under the influence of gravity. Landslides are frequently triggered by intense rainfall or seismic shaking but can also occur as a result of erosion and downslope runoff caused by rain following a fire. As previously discussed in Response 3.7.2(a)(iv), the proposed Project would not introduce any new topographical features or elements that would increase the risk of landslide within the Project vicinity. Furthermore, as stated previously, the Project is not located in or near a VHFHSZ nor is it located in or near a State Responsibility Area. Therefore, the proposed Project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, postfire slope instability, or drainage changes. There would be no impact, and no mitigation is required.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

3.21.1 Impact Analysis

a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant with Mitigation Incorporated. As described in the analysis in this IS/MND, the proposed Project would not degrade the quality of the environment, substantially reduce the habitats of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, or threaten to eliminate a plant or animal with implementation of Mitigation Measures BIO-1 through BIO-9 listed in Section 3.4, Biological Resources. In addition, the proposed Project would not eliminate important examples of major periods of California history or prehistory with implementation of Mitigation Measures CULT-1 and CULT-2 listed in Section 3.5, Cultural Resources, and Mitigation Measure GEO-1, listed in Section 3.7, Geology and Soils. With implementation of the mitigation measures listed above, impacts would be less than significant.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less Than Significant with Mitigation Incorporated. As a roadway improvement project, the proposed Project would result in minor changes to the environmental setting. The proposed Project would reduce traffic congestion and improve safety for motorized and nonmotorized travel. Other impacts are minor and would not be considered cumulatively considerable because they would be addressed through compliance with mitigation measures described throughout this document and regulatory requirements. Therefore, with mitigation incorporated, the proposed Project would not have impacts that are individually limited but cumulatively considerable.

c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant with Mitigation Incorporated. Implementation of the proposed Project has the potential to result in significant impacts related to air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, transportation, and utilities and service systems, which could indirectly impact human beings. However, with the exception of transportation, these impacts are related to construction activities, which are temporary and would cease once the project is operational. In addition, implementation of the mitigation measures described throughout this document would reduce all potential impacts to less-than-significant levels. Therefore, the proposed Project would not result in environmental impacts that would cause substantial adverse effects on human beings.

3.21.2 Mitigation Measures

Refer to 3.1, Aesthetics, for Mitigation Measure AES-1, Section 3.3, Air Quality, for Mitigation Measure AQ-1; Section 3.4, Biological Resources, for Mitigation Measures BIO-1 through BIO-9; Section 3.5, Cultural Resources, for Mitigation Measures CULT-1 and CULT-2; Section 3.7, Geology and Soils, for Mitigation Measure GEO-1; Section 3.9, Hazards and Hazardous Materials, for Mitigation Measure HAZ-1; Section 3.10, Hydrology and Water Quality, for Mitigation Measures HYDRO-1 through HYDRO-3; Section 3.13, Noise, for Mitigation Measure NOISE-1; Section 3.17, Transportation, for Mitigation Measures TR-1 and TR-2; and Section 3.19, Utilities and Service Systems, for Mitigation Measures UTL-1 and UTL-2.

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APPENDIX A

TECHNICAL REPORTS

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APPENDIX A

Appendix A Historic Property
Survey Report

HISTORIC PROPERTY SURVEY REPORT

1. UNDERTAKING DESCRIPTION AND LOCATION

District	*County*	*Federal Project. Number. (Prefix, Agency Code, Project No.)*	*Location*
12	ORA	BRLS 5063 (184)	Santa Ana, California

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans.

The studies for this undertaking were carried out in a manner consistent with Caltrans' regulatory responsibilities under Section 106 of the National Historic Preservation Act (36 CFR Part 800) and pursuant to the January 2014 *First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act* (Section 106 PA), as well as under Public Resources Code 5024 and pursuant to the January 2015 *Memorandum of Understanding Between the California Department of Transportation and the California State Historic Preservation Office Regarding Compliance with Public Resources Code Section 5024 and Governor's Executive Order W-26-92* (5024 MOU) as applicable.

Project Description:

The City of Santa Ana (City), in conjunction with the California Department of Transportation (Caltrans) District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street Bridge over the Santa Ana River in Santa Ana, California.

The proposed Project would widen Fairview Street from two lanes in each direction to three lanes in each direction. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. The proposed bridge would have the same roadway profile as the existing bridge. The existing four-lane bridge is the only constraint in the Project Area for Fairview Street to be built out to its master-planned width of six lanes. Fairview Street is designated as a six-lane Major Arterial, as shown in the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

For further details of the project, please see the attached Archaeological Survey Report (ASR; Attachment D).

2. AREA OF POTENTIAL EFFECTS

In accordance with Section 106 PA Stipulation VIII.A, the Area of Potential Effects (APE) for the project was established in consultation with Jonathan Wright, PQS Lead Archaeological Surveyor, and Tifini Tran, District 12 Local Assistance Engineer, on June 20, 2019. The APE map is in this Historic Property Survey Report (HPSR) as Attachment A, Map 3.

The 11.93-acre APE was established as the area encompassing all places in which the project has the potential to directly or indirectly affect historic properties if any such properties exist. The vertical APE within the APE will extend to a maximum depth of 15 feet for bridge abutments.

3. CONSULTING PARTIES / PUBLIC PARTICIPATION

☒ Native American Heritage Commission

In a letter dated February 12, 2018, Gayle Totton of the Native American Heritage Commission (NAHC) responded to a February 9, 2018, request for a Sacred Lands File (SLF) search. Ms. Totton advised that the results of the search were negative for Native American cultural resources in the project APE but recommended contacting 23 individuals representing the Gabrielino, Juaneño, Kitanemuk, Kumeyaay, Serrano, and Tataviam groups who may have knowledge of cultural resources in or close to the project APE.

For additional details, please see Attachment E of this HPSR.

☒ Native American Tribes, Groups and Individuals

The following Native American Tribes, groups, and individuals were contacted via letter sent by certified mail on March 27, 2018, and contacted again on April 5, 2018, or April 10, 2018, with follow-up phone calls or emails:

- Campo Band of Mission Indians, Ralph Goff, Chairperson: No response was received.
- Ewiiaapaayp Tribal Office, Michael Garcia, Vice Chairperson: No response was received.
- Ewiiaapaayp Tribal Office, Robert Pinto, Chairperson: No response was received.
- Gabrieleno Band of Mission Indians – Kizh Nation, Andrew Salas, Chairperson: Consultation was requested by letter via email. A teleconference was offered via email by Caltrans, but no further response was received from Mr. Salas' group.
- Gabrieleno/Tongva San Gabriel Band of Mission Indians, Anthony Morales, Chairperson: No response was received.
- Gabrielino/Tongva Nation, Sandonne Goad, Chairperson: No response was received.
- Gabrielino Tongva Indians of California Tribal Council, Robert Dorame, Chairperson: No response was received.
- Gabrielino-Tongva Tribe, Charles Alvarez: No response was received.
- Jamul Indian Village, Erica Pinto, Chairperson: No response was received.
- Juaneño Band of Mission Indians, Sonia Johnston, Chairperson: No response was received.
- Juaneño Band of Mission Indians Acjachemen Nation – Belardes, Joyce Perry, Tribal Manager: No response was received.
- Juaneño Band of Mission Indians Acjachemen Nation – Belardes, Matias Belardes, Chairperson: No response was received.
- Juaneño Band of Mission Indians Acjachemen Nation – Romero, Teresa Romero, Chairperson: No response was received.
- La Posta Band of Mission Indians, Gwendolyn Parada, Chairperson: No response was received.
- La Posta Band of Mission Indians, Javaughn Miller, Tribal Administrator: No response was received.
- Manzanita Band of Kumeyaay Nation, Angela Elliott Santos, Chairperson: No response was received.
- San Fernando Band of Mission Indians, John Valenzuela, Chairperson: No response was received.
- San Pasqual Band of Mission Indians, John Flores, Environmental Coordinator: No response was received.
- San Pasqual Band of Mission Indians, Allen E. Lawson, Chairperson: No response was received.
- Sycuan Band of the Kumeyaay Nation, Cody J. Martinez, Chairperson: No response was received.
- Sycuan Band of the Kumeyaay Nation, Lisa Haws, Cultural Resources Manager: No response was received.
- Viejas Band of Kumeyaay Indians, Robert Welch, Chairperson: A response letter dated April 2, 2018, was received from Ray Teran, Resource Management for the Viejas Band of Kumeyaay Indians. This letter stated that the project has little cultural significance or ties to Viejas, and requested that they be informed of any inadvertent discoveries.
- Viejas Band of Kumeyaay Indians, Julie Hagen: No response was received; Ms. Hagen is no longer with the Tribe.

For more details of the Native American consultation, please see Attachment E.

☒ Local Historical Society / Historic Preservation Group

Formal outreach was conducted beginning on March 21, 2019. This consisted of mailing a letter and map regarding the project to various groups, organizations, and individuals (see below). On April 24, 2019, follow-up emails were sent. No responses have been received to date. Refer to Attachment F for details.

- Santa Ana Historical Preservation
- Santa Ana History Room
- Heritage Museum of Orange County
- Phil Brigandi, Local Historian

4. SUMMARY OF IDENTIFICATION EFFORTS

☒ National Register of Historic Places (NRHP)

☒ California Register of Historical Resources (CRHR)

☒ National Historic Landmark (NHL)

☒ California Historical Landmarks (CHL)

☒ California Points of Historical Interest

☒ California Historical Resources Information System (CHRIS)

☒ Caltrans Historic Bridge Inventory

☒ Results:

On March 5, 2018, a record search was conducted at the South Central Coastal Information Center of the California Historical Resources Information System at California State University, Fullerton. The records search identified eight cultural resources studies that included parts of the APE. These studies include surveys (4), literature searches (2), monitoring (1), and an Environmental Impact Statement (EIS) (1). An additional 31 studies have been conducted within 1 mile of the APE. These studies include surveys (24), literature searches (2), evaluation/assessments (3), a project authorization (1) and an EIS (1).

There are no previously recorded sites within the APE. There have been 44 resources recorded within 1 mile of the APE (1 prehistoric and 43 historic). The prehistoric resource (a habitation site that is no longer extant) is approximately 1 mile from the APE. Of the historic resources, 1 is a railroad bridge and the other 42 are buildings. The buildings include single-family residences (28), commercial (10), single-family residence/commercial (1), hotel/motels (2), and a school (1).

The Office of Historic Preservation Historic Property Data File (HRI) includes properties in both Santa Ana and Garden Grove. There are 18 listed properties in Santa Ana within 1 mile of the APE. All of the properties are buildings constructed 1898–1955. Seventeen of the buildings were determined ineligible for National Register of Historic Places (NRHP) listing, while 1 needs re-evaluation. In Garden Grove, the HRI identifies 11 properties with 1 mile of the APE. These properties include buildings (9), an 1880 eucalyptus vat, and a 1976 storm drain. The storm drain was determined ineligible for National Register listing while the eucalyptus vat needs re-evaluation. The nine buildings were constructed 1949–2000. All nine buildings were determined to be ineligible for listing in the National Register.

For more details regarding the results of the records search, please see the ASR (Attachment D).

5. PROPERTIES IDENTIFIED

☒ Caltrans has determined there are cultural resources within the APE that were evaluated as a result of this project and are **not eligible** for inclusion in the NRHP/CHL. Under Section 106 PA Stipulation VIII.C.6 and as applicable PRC 5024 MOU Stipulation VIII.C.6, <u>Caltrans requests SHPO's concurrence in this determination.</u>

- 1007-1009 Marengo Place (APE Map Reference #1) – Ranch style duplex built in 1956.
- 1003-1005 Marengo Place (APE Map Reference #2) – Vernacular duplex built in 1956.

☒ Ivan H. Strudwick, who meets the Professionally Qualified Staff (PQS) Standards in Section 106 PA Attachment 1 and as applicable PRC 5024 MOU Attachment 1 as a Principal Investigator – Prehistoric Archaeology equivalent, and Casey Tibbet, who meets the Professionally Qualified Staff (PQS) Standards in Section 106 PA Attachment 1 and as applicable PRC 5024 MOU Attachment 1 as a Principal Architectural Historian equivalent, have determined that the only other properties present within the APE meet the criteria for Section 106 PA Attachment 4 (**Properties Exempt from Evaluation**) and as applicable PRC 5024 MOU Stipulation VIII.C.1 and Attachment 4.

- LSA-WKE1702-IS-I-1: Isolated *Chione* shell (Isolated prehistoric find consisting of fewer than three items per 100 square meters). See Appendix C of the ASR (Attachment D of this HPSR) for DPR forms.

- Built environment that is either modern or extensively altered.

☒ Bridges listed as **Category 5** (previously determined not eligible for listing in the NRHP) in the Caltrans Historic Bridge Inventory are present within the APE and those determinations remain valid. Appropriate pages from the Caltrans Historic Bridge Inventory are attached (Attachment B).

- Bridge 55C0513: Santa Ana River Channel

6. FINDING FOR THE UNDERTAKING

☒ Caltrans, pursuant to Section 106 PA Stipulation IX.A and as applicable PRC 5024 MOU Stipulation IX.A.2, has determined a Finding of **No Historic Properties Affected** is appropriate for this undertaking because there are no historic properties within the APE.

7. CEQA CONSIDERATIONS

☒ Not applicable; **Caltrans is not the lead agency under CEQA**.

8. LIST OF ATTACHED DOCUMENTATION

☒ Project Vicinity, Location, and APE Maps – Attachment A

☒ Caltrans Historic Bridge Inventory Sheet – Attachment B

☒ Historical Resources Evaluation Report (HRER) – Attachment C

☒ Archaeological Survey Report (ASR) – Attachment D
Strudwick, Ivan H. 2019. *Archaeological Survey Report for the Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project, Orange County, California. Federal Project No.: BRLS 5063 (184). LSA Associates, Inc.*

☒ Native American Consultation Records – Attachment E

☒ Historic Outreach – Attachment F

9. HPSR PREPARATION AND CALTRANS APPROVAL

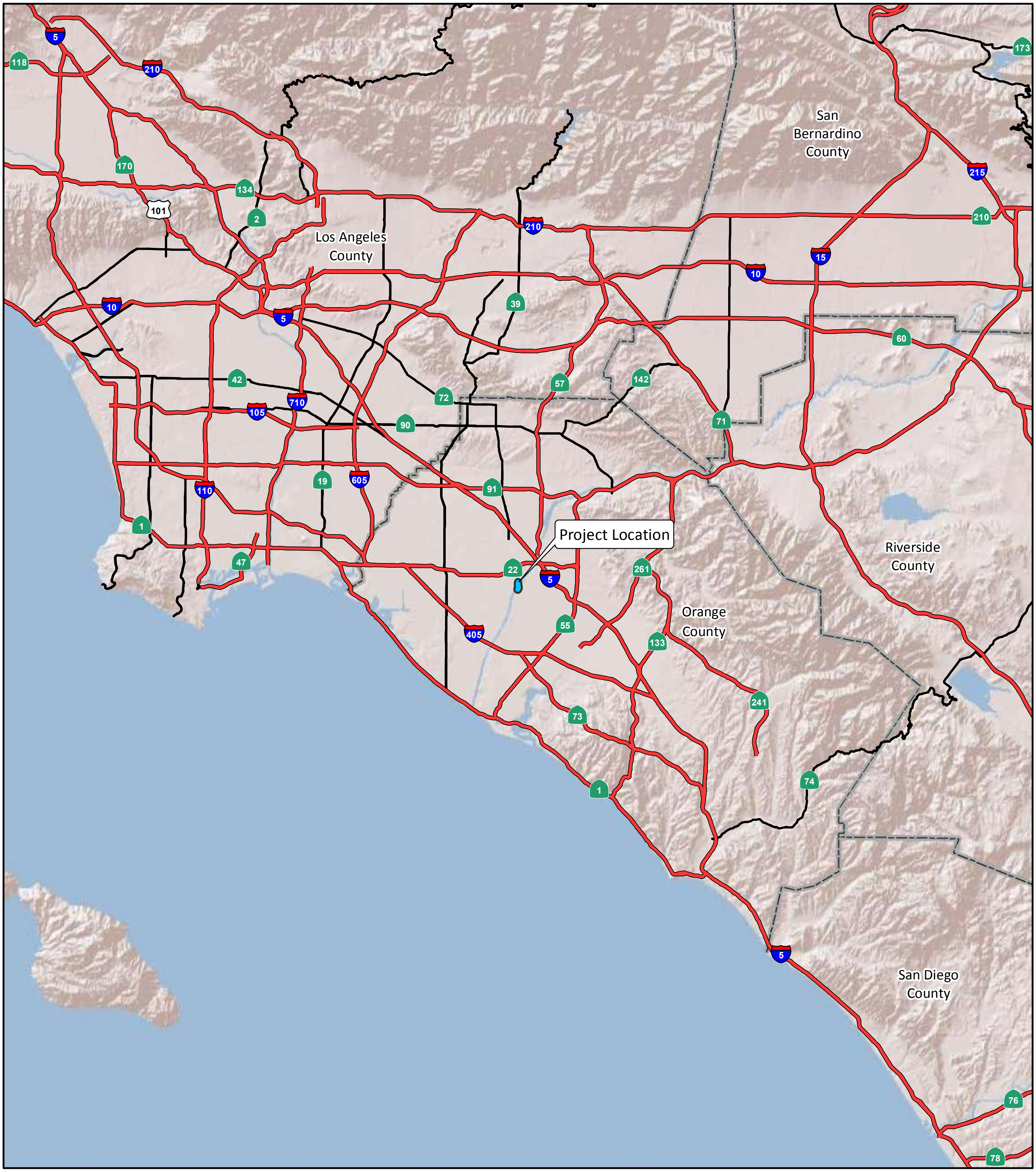
Prepared by: Kerrie N Collison June 26, 2019
Kerrie Collison, Archaeologist Date
LSA, Irvine, California

Reviewed for Approval by: Jonathan Hallett 7/1/2019
District 12 Caltrans Date
PQS

Approved by: C. Baker 7/1/2019
Charles Baker, Environmental Branch Chief Date
District 12 EBC

Attachment A

Project Vicinity, Location, and APE Maps



MAP 1

LEGEND

Project Area

0 25000 50000
FEET

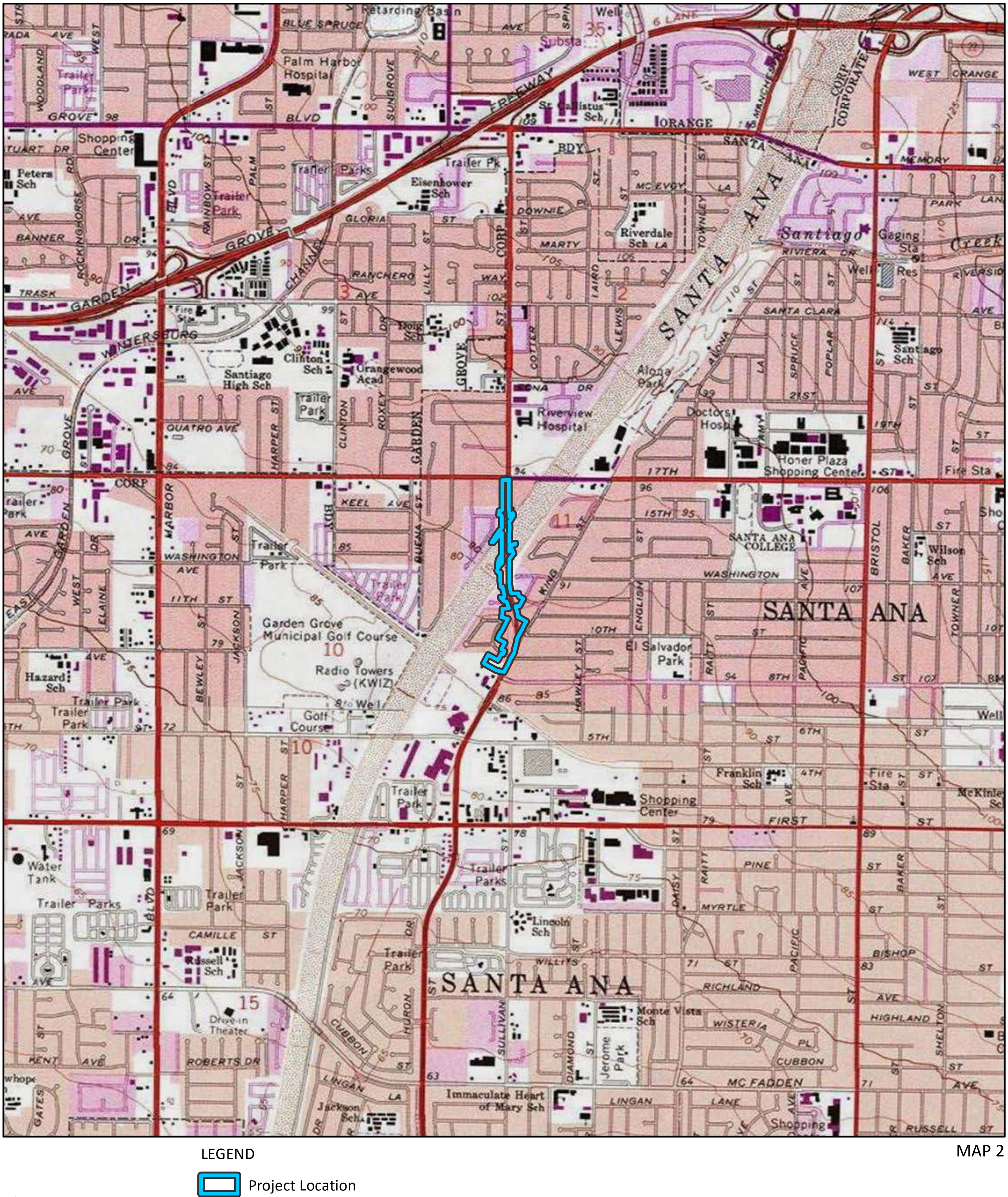
Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Project Location

Federal Project No.: BRLS 5063(184)

SOURCE: Esri (2017)

I:\WKE1702\GIS\HPSR_ProjLoc.mxd (5/21/2019)



MAP 2

LEGEND

Project Location

0 1000 2000
FEET

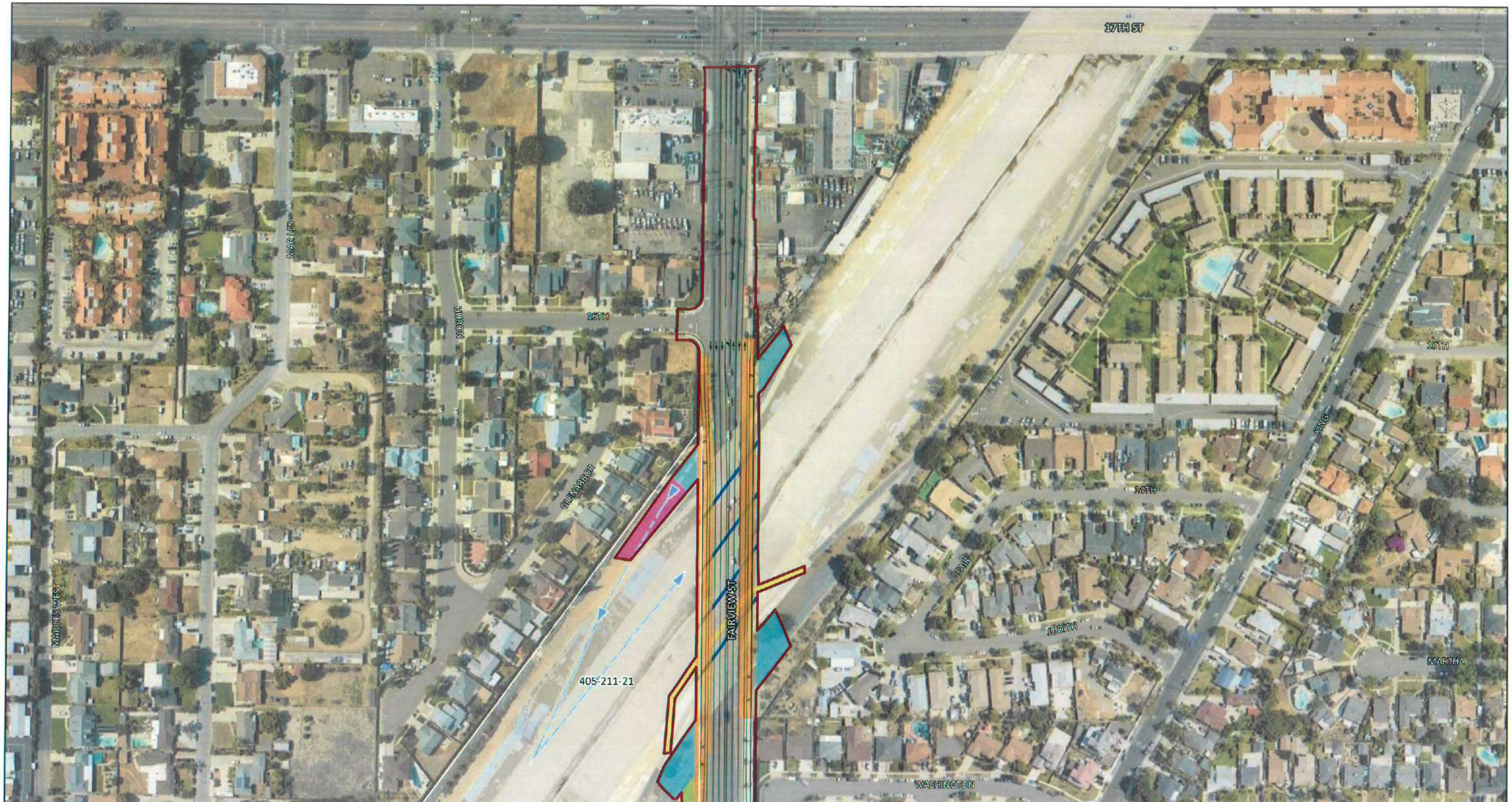
SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Project Location

Federal Project No.: BRLS 5063(184)

I:\WKE1702\GIS\HPSR_ProjLocUSGS.mxd (5/21/2019)



LEGEND

- Area of Potential Effects
- Proposed Right of Way Acquisition
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- Resources Evaluated
- Proposed Construction Access
- Potential Noise Barriers

0 90 180
FEET

SOURCE: Google (2016); WKE (2018)

I:\WKE1702\GIS\APE.mxd (5/7/2019)

Caltrans District 12 Local Assistance Engineer — Date: 6/20/19

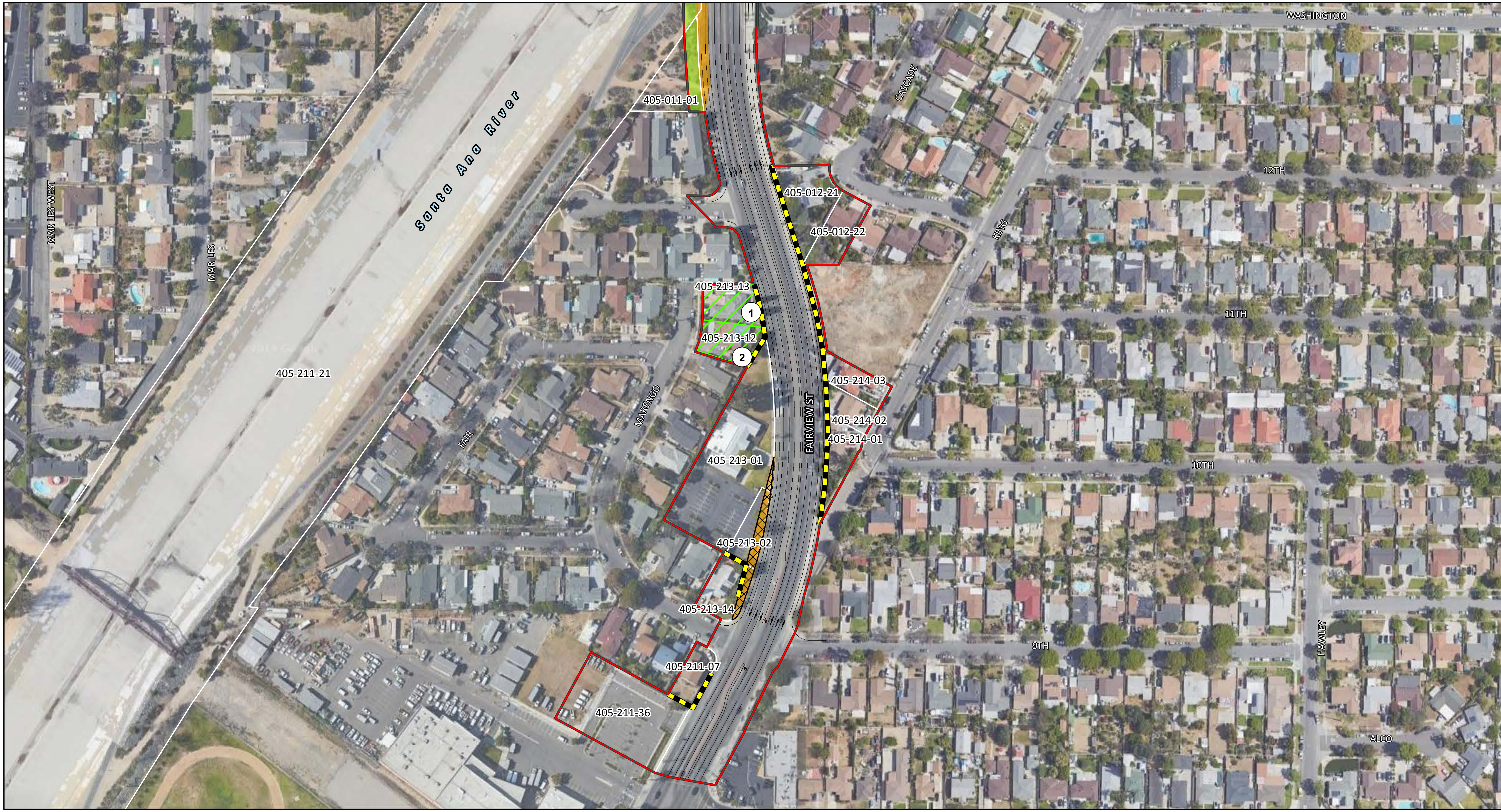
Caltrans District 12 Archaeologist — Date: 6/20/2019

MAP 3
Sheet 1 of 2

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Area of Potential Effects (APE)

Federal Project No.: BRLS 5063(184)



LEGEND

- Area of Potential Effects
- Proposed Right of Way Acquisition
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- # Resources Evaluated
- Proposed Construction Access
- Potential Noise Barriers

N

0 90 180
FEET

SOURCE: Google (2016); WKE (2018)

I:\WKE1702\GIS\APE.mxd (5/7/2019)

MAP 3
Sheet 2 of 2

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Area of Potential Effects (APE)

Federal Project No.: BRLS 5063(184)

Attachment B

Caltrans Historic Bridge Inventory Sheet

District 12

Orange County

Bridge Number	Bridge Name	Location	Historical Significance	Year Built	Year Wid/Ext
55C0510	SANTA ANA RIVER CHANNEL	0.43 MI. N/O ROUTE 91 FWY	5. Bridge not eligible for NRHP	1970	1979
55C0511	SANTIAGO CREEK	1.74 MI. E/O ROUTE 55 FWY	5. Bridge not eligible for NRHP	1982	
55C0513	SANTA ANA RIVER CHANNEL	0.2 MI S/O WESTMINSTER AV	5. Bridge not eligible for NRHP	1963	
55C0514	BARRANCA CHANNEL	0.3 MI E/O JAMBOREE RD	5. Bridge not eligible for NRHP	1975	
55C0515	CARBON CREEK CHANNEL	0.2 MI. W/O MAGNOLIA ST.	5. Bridge not eligible for NRHP	1959	
55C0520L	ARROYO TRABUCO	0.2 MI E/O ALICIA PARKWAY	5. Bridge not eligible for NRHP	1991	
55C0520R	ARROYO TRABUCO	0.2 MI. SE/O ALICIA PKWY	5. Bridge not eligible for NRHP	1984	
55C0521	SALT CREEK PARK UC	0.1 MI W/O ROUTE 1	5. Bridge not eligible for NRHP	1974	
55C0522	OLD CANAL ROAD UC	0.2 MI N/O FWY 91	5. Bridge not eligible for NRHP	1984	
55C0525	FULLERTON COLLEGE POC	0.1 MI E/O LEMON ST	5. Bridge not eligible for NRHP	1984	
55C0526	CHEVRON SERVICE ROAD OC	0.8 MI S/O IMPERIAL HWY	5. Bridge not eligible for NRHP	1985	
55C0528	BAKE PARKWAY OVERHEAD	0.3 MI NE/O MUIRLAND BLVD	5. Bridge not eligible for NRHP	1985	
55C0529L	ALISO CREEK	400' E/O MOULTON PKWY	5. Bridge not eligible for NRHP	1985	
55C0529R	ALISO CREEK	400' E/O MOULTON PKWY	5. Bridge not eligible for NRHP	1985	
55C0531	HUNTINGTON BEACH CHANNEL	0.2 MI N/O ROUTE 1	5. Bridge not eligible for NRHP	1984	2008
55C0532	WALNUT CANYON CHANNEL	100' N/O NOHL RANCH ROAD	5. Bridge not eligible for NRHP	1972	
55C0533	WALNUT CANYON CHANNEL	100' N/O NOHL RANCH ROAD	5. Bridge not eligible for NRHP	1972	
55C0534	HANDY CREEK	0.3 MI E/O ORANGE PARK BL	5. Bridge not eligible for NRHP	1985	1990
55C0535	EL MODENA-IRVINE CHANNEL	100' NW/O MYFORD ROAD	5. Bridge not eligible for NRHP	1987	
55C0536	EL MODENA-IRVINE CHANNEL	100' NW/O MYFORD ROAD	5. Bridge not eligible for NRHP	1987	
55C0537	EL MODENA-IRVINE CHANNEL	100' N/O BRYAN AVENUE	5. Bridge not eligible for NRHP	1987	
55C0538	EL MODENA-IRVINE CHANNEL	100' N/O BRYAN AVENUE	5. Bridge not eligible for NRHP	1987	
55C0539	BROWNING AVENUE STORM DRAIN	50' SE/O BROWNING AVENUE	5. Bridge not eligible for NRHP	1986	
55C0540	ALISO CREEK	200' W/O EL TORO ROAD	5. Bridge not eligible for NRHP	1987	
55C0541	VIA LOMAS DE YORBA WEST UP	0.2 MI N/E LA PALMA AVE	5. Bridge not eligible for NRHP	1985	1996
55C0542	VIA LOMAS DE YORBA EAST OH	0.2 MI. N/O LA PALMA AVE.	5. Bridge not eligible for NRHP	1986	
55C0543	LOFTUS DIVERSION CHANNEL	100' NW/O ASSOCIATED RD.	5. Bridge not eligible for NRHP	1968	
55C0544	CARBON CANYON CHANNEL	0.1 MI E/O YORBA LINDA BL	5. Bridge not eligible for NRHP	1912	1974
55C0545	WESTMINSTER CHANNEL	0.3 MI S WESTMINSTER AVE	5. Bridge not eligible for NRHP	1978	
55C0546	WESTMINSTER CHANNEL	200' S HAZARD AVE	5. Bridge not eligible for NRHP	1974	
55C0547	WESTMINSTER CHANNEL	0.3 MI NORTH BOLSA AVE	5. Bridge not eligible for NRHP	1974	
55C0548	WOODBRIDGE SOUTH LKE POC	0.8 MI. SE/O CULVER DRIVE	5. Bridge not eligible for NRHP	1986	
55C0549	CANADA CHANNEL	0.2 MI S LAKE FOREST DR	5. Bridge not eligible for NRHP	1980	
55C0550	ALISO CREEK	100' W/O ALICIA PARKWAY	5. Bridge not eligible for NRHP	1988	
55C0551L	BONITA CREEK CHANNEL	0.1 MI W/O MACARTHUR BLVD	5. Bridge not eligible for NRHP	1988	
55C0551R	BONITA CREEK CHANNEL	0.1 MI W/O MACARTHUR BLVD	5. Bridge not eligible for NRHP	1988	
55C0552	BORREGO CANYON CHANNEL	0.6 MI NW/O ALTON PARKWAY	5. Bridge not eligible for NRHP	1987	
55C0553	MAGAZINE ROAD UC	2.9 MI SE SAND CANYON AVE	5. Bridge not eligible for NRHP	1988	
55C0554	UNIVERSITY TOWN CENTER POC	0.5 MI. SE/O UNIVERSITY	5. Bridge not eligible for NRHP	1987	
55C0555	CAPISTRANO SRFSD INN POC	0.5 M S/O PARK LANTEM	5. Bridge not eligible for NRHP	1986	
55C0556	SANTA ANA-SANTA FE CHANNEL	100' S/O EDINGER AVENUE	5. Bridge not eligible for NRHP	1991	
55C0557	MOFFETT DRIVE UC	0.5 MI S/O EDINGER AVE	5. Bridge not eligible for NRHP	1991	
55C0558	WARNER AVENUE UC	0.5 MI. NE/O BARRANCA PWY	5. Bridge not eligible for NRHP	1991	

Attachment C

Historical Resources Evaluation Report (HRER)

HISTORICAL RESOURCES EVALUATION REPORT

Fairview Street Improvements from 9th Street to 16th Street and
Bridge Replacement Project
City of Santa Ana, Orange County, California

CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 12

Federal Project Number: BRLS 5063(184)

Prepared by: Casey Tibbet

Casey Tibbet, M.A.
Principal Architectural Historian
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1500 Iowa Avenue, Suite 200
Riverside, California 92507

Reviewed by: Douglas A. Bright

Douglas Bright
PQS Principal Architectural Historian
California Department of Transportation
111 Grande Avenue
Oakland, California 94623

Approved by:

Charles Baker, Environmental Branch Chief
California Department of Transportation
1750 East 4th Street, Suite 100
Santa Ana, California 92705

June 2019

SUMMARY OF FINDINGS

The City of Santa Ana, in conjunction with Caltrans District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River in the City of Santa Ana (City), California (Historic Property Survey Report [HPSR], Attachment A, Maps 1, 2, and 3). The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element. The proposed project would widen Fairview Street from two lanes in each direction to three lanes in each direction in the City. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. The proposed project would require partial acquisitions, temporary utilities relocation, water quality best management practices (BMPs), and temporary closures of a portion of the Santa Ana River Trail (SART).

This Historical Resources Evaluation Report (HRER) was prepared in compliance with the *First Amended Programmatic Agreement among the Federal Highway Administration , the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California*, effective January 1, 2014 (Caltrans Section 106 PA). Cultural resources were identified and evaluated for the National Register of Historic Places (National Register) as required by the First Amended 2014 Section 106 PA, using National Register eligibility criteria found in 36 Code of Federal Regulations Part 800 and the regulations implementing Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. These evaluations comply with California Environmental Quality Act (CEQA) requirements and evaluate identified cultural resources in accordance with California Public Resources Code (PRC) Section 15064.5(a)(2)–(3) using the criteria outlined in PRC Section 5024.1. The document was also prepared in compliance with PRC 5024 for State-owned historical resources.

An archaeological field survey of the area of direct impacts within the project Area of Potential Effects (APE) was conducted on March 16, 2018. An architectural field survey of the entire APE was conducted on April 4, 2019. As a result of these surveys, two historic-period (50 years of age or older) resources were identified in the APE that required evaluation. These are two 1956 duplexes located at 1007-1009 Marengo Place and 1003-1005 Marengo Place (APE Map Reference Numbers [APE MR#s] 1 and 2, respectively). Neither of these resources was evaluated as eligible for listing in the National Register (refer to Section IX of this HRER).

One bridge, Santa Ana River Channel 55C0513, was identified in the project APE. According to the Caltrans Local Agency bridge list (March 2019), it has been evaluated as Category 5, not eligible for listing in the National Register (HPSR Attachment B).

All other built environment properties within the project APE have been determined exempt from further evaluation pursuant to Attachment 4 of the Caltrans Section 106 PA as Property Types 2, 4, 5, and 6, which are modern construction, buildings that have been moved, or historic-period construction that has lost integrity because of alterations.

TABLE OF CONTENTS

I. PROJECT DESCRIPTION

INTRODUCTION

The City of Santa Ana, in conjunction with Caltrans District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed project) in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction, which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic bottleneck during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

The Santa Ana River Trail (SART) runs on both sides of the Santa Ana River in the project area. The SART is a Section 4(f) Resource and would be temporarily closed intermittently during construction of the Project.

PROJECT DESCRIPTION

The proposed project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge over the Santa Ana River. The proposed project would widen Fairview Street from two lanes in each direction to three lanes in each direction in the City of Santa Ana. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

The proposed bridge would be expanded from approximately 52 to 100 feet in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed and four new pier walls would be constructed to support the new bridge.

The proposed project would acquire partial right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APN) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]).

An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. These utilities would be temporarily relocated during construction and then permanently relocated to the new bridge.

Water quality best management practices (BMPs), such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area, would be included to treat storm water runoff.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bicyclists would be detoured away from the Fairview Street bridge to the 17th Street bridge to cross the Santa Ana River by way of the SART between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists wishing to cross the Santa Ana River would be detoured to adjacent City streets such as King Street.

Construction of the proposed project would require temporary closures of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of SART affected by project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detour are being coordinated with Orange County (OC) Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the riverbed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the riverbed.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 feet west of the project area. All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to pre-construction conditions or better prior to project completion.

Area of Potential Effects

The Fairview Street Improvements Project has the potential to affect historic-period (i.e., 50 years of age or older) properties both directly and indirectly. Properties that may be affected have been included within the Area of Potential Effects (APE) for the project. The mapped project APE (HPSR, Attachment A, Map 3) was established in consultation with

Caltrans District 12 Cultural Studies staff and is the combination of the areas of potential direct and indirect effects. The areas of direct effects include the areas where physical impacts may occur. These are generally limited to the proposed and existing right-of-way (ROW) and include areas associated with ground-disturbing activities, including the vertical and horizontal construction limits. The vertical APE within the areas of direct effects will extend to a maximum depth of 15 feet for bridge abutments. The areas of indirect effects extend beyond those of the direct effects and incorporate areas that may be indirectly affected by visual, noise, or other effects. The area within the APE that may be subject to direct impacts was surveyed for archaeological resources and the entire APE was surveyed for historic-period built environment resources.

II. RESEARCH METHODS

RECORDS SEARCH

On March 5, 2018, a records search was conducted of the California Historical Resources Information System (CHRIS) at the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton. The records search included a review of all recorded historic and prehistoric sites within a one-mile radius of the APE, as well as a review of known cultural resources survey, excavation, and other studies. In addition, the following inventories were examined: National Register of Historic Places (National Register), California Register of Historical Resources (California Register), California Historical Landmarks, California Points of Historical Interest, and the California Historic Resources Inventory.

The records search identified a total of eight cultural resource studies that included portions of the APE and an additional 31 studies that were conducted within one mile of the APE. Prior cultural resource studies recorded no cultural resources within the APE but did record 44 resources within one mile of the APE. The two closest resources, the 1905 Pacific Electric Railroad Santa Ana River Bridge (P-30-161847) and the 1926 Hales-Hill Feed Warehouse (P-30-177031), are within 0.25 mile of the APE. Detailed information about the records search can be found in the Archaeological Survey Report (HPSR Attachment D).

OUTREACH AND ARCHIVAL RESEARCH

As part of the pre-field research, background research for the APE was conducted using published literature in local and regional history, online resources regarding the history and development of the area, and historic aerial photographs and maps of the project vicinity. Once resources requiring evaluation were identified, additional research was conducted to develop relevant historic contexts and property-specific chronologies. In addition, formal outreach was conducted beginning on March 21, 2019. This consisted of mailing a letter and map regarding the project to various groups, organizations, and individuals. No responses were received. On April 24, 2019, follow-up emails were sent. No responses have been received to date.

A list of the outreach contacts is provided below and detailed information regarding the outreach, including sample letters and a map, can be found in the Historic Property Survey Report (HPSR, Attachment E).

- Santa Ana Historical Preservation
- Santa Ana History Room
- Heritage Museum of Orange County
- Phil Brigandi, Local Historian

III. FIELD METHODS

ARCHAEOLOGICAL SURVEY METHODS

On March 16, 2018, a pedestrian survey of portions of the APE was completed. Because much of the project area is within Fairview Street ROW, survey did not occur in all areas. Areas of exposed ground, even if vegetated, were surveyed by walking linear transects separated by 7 to 10 meters over larger areas and opportunistically over smaller areas. Special attention was given to larger areas that exhibited exposed sediment, such as alongside the Santa Ana River bike trail. Areas within the APE that were not surveyed included the central portion of the street. Due to project access along the sidewalk, the sidewalk was surveyed, with focus being the many open areas where palm trees are planted, as well as lawns and other open areas with and without vegetative cover.

ARCHITECTURAL SURVEY METHODS

On April 4, 2019, architectural historians Casey Tibbet and Eugene Heck conducted an intensive-level pedestrian survey of the historic-period built environment in the APE. During the survey, Ms. Tibbet took digital photographs of the exteriors of the historic-period buildings and features and made detailed notations regarding their current conditions, integrity levels, physical characteristics, and setting. In addition, Ms. Tibbet and Mr. Heck completed a reconnaissance-level survey of the general setting, as well as the buildings and features that are exempt from evaluation pursuant to the Caltrans Section 106 PA.

IV. HISTORICAL OVERVIEW

The APE includes historic-period and modern residential and commercial properties, as well as segments of the Santa Ana River Channel and various local streets. Two 1956 duplexes (APE MR#s 1 and 2; 1007–1009 Marengo Place and 1003–1005 Marengo Place) in the APE were evaluated as part of this study. Because the evaluated resources date to the post-World War II period, limited information about the Spanish/Mission (1769–1821) and Mexican/Rancho (1821–1848) periods is provided. Instead, the historic context focuses on the settlement and development of Santa Ana and the APE during the American Period (1848 to present).

SPANISH/MISSION PERIOD (1769–1821)

Beginning with the Portolá expedition of 1769–1770, Franciscan missions were established along coastal California between San Diego and Sonoma. Beginning in 1784, Spanish army officers and veterans living in California began receiving land concessions and establishing large, private grazing areas (Cowan 1993:8). During this period, the APE was part of the *Rancho Los Nietos*, which was a grant of approximately 300,000 acres made in 1784 by Governor Fages to Manuel Nieto (Beck and Haase 1974:Map 37; Shumway 1993:58).

MEXICAN/RANCHO PERIOD (1821–1848)

In 1821, Mexico gained independence from Spain and Mexico took control of California. During this period, there was a change from the subsistence agriculture of the Spanish/ Mission Period to livestock husbandry of the large ranches, or *ranchos*, acquired by Mexican citizens through grants or by purchase from mission administrators (Strudwick 2018:13). In 1833, Governor Figueroa granted the *Rancho los Nietos* to the heirs of Manuel Nieto, and in 1834, seven leagues were re-granted to Doña Catarina Ruiz, widow of Manuel Nieto, as *Rancho las Bolsas* by Governor Figueroa (Meadows 1966:115; Shumway 1993:58). The APE is approximately two miles southwest of the northeastern-most point of *Rancho las Bolsas*.

AMERICAN PERIOD (1848–PRESENT)

Following the end of hostilities between Mexico and the United States, the U. S. officially obtained California in the Treaty of Guadalupe Hidalgo on February 2, 1848 (Cleland 1962:xiii). In the late 1850s and early 1860s, the cattle industry collapsed due to drought and sheep ranchers began to proliferate.

The City of Santa Ana had its beginnings in the late 1860s when William H. Spurgeon from Kentucky bought 74.2 acres from Jacob Ross, Sr. and laid out the town of Santa Ana (Goddard and Goddard 1988). The town consisted of 24 blocks and the boundaries were First Street to the south, West Street (now Broadway) to the west, Seventh Street to the north, and Spurgeon Street to the east (Ibid.). The original townsite was approximately two miles east of the APE.

Spurgeon was the driving force behind the city until his death in 1915. He was responsible for building an artesian well and small water tower to supply the residents' water in 1869 and constructing a road to make access to Anaheim and the Wells Fargo stage easier before Wells Fargo opened an office in Santa Ana in 1874 (Goddard and Goddard 1988). Spurgeon ran a small general store and, in 1870, he became postmaster (Ibid.). In 1886, when the city incorporated with a population of 2,000, he became the first mayor and when Orange County was formed in 1889, Santa Ana was chosen as the county seat and Spurgeon was elected chairman of the County Board of Supervisors (Ibid.). By 1887–88, the Santa Fe trains reached Santa Ana and in 1906 the Red Car from Los Angeles ran along Fourth Street on the new Pacific Electric line (Ibid.). In 1892, the school graduated its first class of three high school boys and by 1898, there were 27 high school graduates (Ibid.). In 1893, Spurgeon donated the land where the County courthouse was built in 1901 and in 1903, a Carnegie Library was built on land donated by Spurgeon at the northwest corner of Fifth and Sycamore (Ibid.).

In 1909, Glenn L. Martin (1886–1955), the third American to design, build, and fly his own plane, built a plane in the abandoned Methodist Church at 200 N. Main (approximately two miles east of the APE; Goddard and Goddard 1988). He flew eight feet off the ground for a distance of 100 feet (Ibid.). By 1912, he had founded the Glenn L. Martin Company, headquartered in Santa Ana, which manufactured the Martin T, a training biplane for the Army (Ibid.). In 1916, he merged his company with the original Wright Company and left California (Ibid.).

Like most southern California communities, Santa Ana experienced growth and prosperity during most of the 1920s followed by hard times in the 1930s. In 1939, ten years into the Depression, the City of Santa Ana took an option on 400 acres near the community of Fairview and hired a Washington lobbyist (Hallan-Gibson 1986:217). The City offered to lease the land to the government for $1 per year in exchange for a military base (Hallan-Gibson 1986:218) and succeeded in getting the War Department to award Santa Ana a facility (Santa Ana Army Air Base, SAAAB) totaling over 1,200 acres (Hallan-Gibson 1986:219). It covered the 400 acres offered by the City plus the old settlement of Fairview and was commissioned in 1942 (Hallan-Gibson 1986:217-220). In addition to SAAAB (approximately 5.5 miles southeast of the APE), the War Department put the West Coast Army Air Corps Training Command Headquarters in downtown Santa Ana (roughly 1.5 miles east of the APE). SAAAB and the Training Command HQ were closed soon after the war, but they played a major role in the post-war boom, when many servicemen who had been trained or stationed there returned to southern California seeking jobs and housing.

By 1945, a shortage of housing, the return of six million servicemen, and continued population growth produced the largest building boom in the country's history (Ames and McClelland 2002). Spurred by builder's credits and liberalized terms for VA and FHA approved mortgages, construction of single-family residences increased from 114,000 in 1944, to 937,000 in 1946 (Ibid.). The classic response to this huge growth was Levittown in Long Island, New York, which eventually had over 17,500 simplified Cape Cod style homes along curvilinear streets and cul-de-sacs (Tibbet 2005). By 1950, home building had reached a record high nationally of 1,692,000 single-family homes (Ames and McClelland 2002).

In 1940, Santa Ana had a population of nearly 32,000, but by 1950, it had soared to more than 45,500—an increase of 42 percent (United States Census n.d.). As a result, large agricultural properties were subdivided to facilitate development of new housing tracts. The property in and around the APE is representative of this since aerial photographs reveal that it remained undeveloped, except perhaps as farmland, until after 1953 (Historicaerials.com var.). Even Fairview Avenue did not exist until after 1953 (Ibid.). The two duplexes (1007–1009 Marengo Place and 1003–1005 Marengo Place; APE MR #s 1 and 2, respectively) evaluated as part of this study were built in 1956 by Lee Sievers (City of Santa Ana var.).

The Sievers Construction Company was founded by Francis Lee Sievers (1913–2005; Ancestry.com var.). Sievers was an electrical contractor, working for his brothers' electrical business and living in Bellflower prior to World War II (Ibid.). In the post-war period, he obtained his general building contractor license and started his own business in Bellflower (Ibid.). An advertisement for his company in the Excelsior Union High School Yearbook of 1949 includes the company motto: "*Distinctive Styling in Modern Building"* (Ancestry.com var.). Sievers was an active home builder in Los Angeles and Orange Counties during the 1950s, 60s, and 70s. Although research findings to date are sparse, he appears to have specialized in small-scale residential projects (Newspapers.com var.). One notable project was Laguna Highlands Homes in Orange County. These custom two- and three-bedroom homes featured large garages, sundecks, spacious glass wall areas and kitchens with modern built-in gas ranges (*Los Angeles Times* 1963). Considering they were overlooking the ocean in the prestigious Arch Bay neighborhood, they appear to be relatively modest homes priced within reach of middle-income buyers (Ibid.).

In 1953, there was a Santa Ana River crossing west of the APE where there is currently an old steel truss railroad bridge (Historicaerials.com var.). Between 1953 and 1963, the river was channelized between levees built by the United States Army Corps of Engineers (USACE; USGS 1949; Orange County Historical Archives var.). Today, except for segments in Riverside and San Bernardino, the Santa Ana River is essentially an enormous reinforced concrete box culvert. The USACE working closely with Orange County planned, designed, and built this feature, which intersects the APE, at a cost of $367 million, starting in 1991 and finishing in 2006 (Orange County Flood Control Division 2019).

Currently, Santa Ana, with a population of approximately 335,000, is the most populous city in Orange County, second only to Anaheim, and is the 11th most populous city in California (Strudwick 2018).

V. DESCRIPTION OF CULTURAL RESOURCES

The APE is characterized by a mix of uses including residential and commercial properties, as well as segments of the Santa Ana River Channel and various local streets. Resources evaluated in the APE as part of this study include two 1956 duplexes (APE MR#s 1 and 2; 1007–1009 Marengo Place and 1003–1005 Marengo Place, respectively). Neither of the resources evaluated as part of this study is eligible for listing in the National Register and therefore they are not discussed further in this section. Detailed descriptions and evaluations can be found in Section IX of this HRER.

VI. FINDINGS AND CONCLUSIONS

FINDINGS

Evaluation documentation is included in Section IX of this HRER. The findings, based on the evaluation documentation, are provided below.

1. Properties listed in the National Register: **None.**
2. Properties previously determined eligible for the National Register: **None.**
3. Properties previously determined *not* eligible for the National Register: **None.**
4. Properties determined eligible for the National Register as a result of the current study (refer to relevant evaluations in attached supporting documentation): **None.**
5. Properties determined *not* eligible for the National Register as a result of the current study (refer to relevant evaluations in attached supporting documentation):

Name	Location	City	OHP Code	MR#
	1007–1009 Marengo Place	Santa Ana	6Z	1
	1003–1005 Marengo Place	Santa Ana	6Z	2

6. Properties for which further study is needed because evaluation was not possible (e.g., archaeological sites that require a test excavation to determine eligibility): **None.**
7. Resources that are historical resources for the purposes of CEQA. (Resources in this category would include California Register-listed or eligible [per State Historical Resources Commission determination] resources identified as significant in surveys that meet State Office of Historic Preservation standards, resources that are designated landmarks under local ordinances, and resources that meet the California Register criteria as outlined in PRC §5024.1.): **None.**
8. Resources that are not historical resources under CEQA, per *CEQA Guidelines* §15064.5, because they do not meet the California Register criteria outlined in PRC §5024.1:

Name	Location	City	OHP Code	MR#
	1007–1009 Marengo Place	Santa Ana	6Z	1
	1003–1005 Marengo Place	Santa Ana	6Z	2

CONCLUSIONS

As stated above, two 1956 duplexes located at 1007–1009 and 1003–1005 Marengo Place (APE MR#s 1 and 2, respectively) in the APE were evaluated as part of this study. Although both duplexes are associated with the post-WWII housing boom, which is a significant historical event in southern California and nation, neither is uniquely representative of that event. In addition, there is no indication that they are associated with any important historical figures and they are not the work of a master or exceptional examples of a particular architectural style or type. Therefore, neither property is as eligible for listing in the National Register. Detailed evaluations are provided in Section IX of this HRER (Department of Parks and Recreation Forms).

One bridge, Santa Ana River Channel 55C0513, was identified in the project APE. According to the Caltrans Local Agency bridge list (March 2019), it has been evaluated as Category 5, not eligible for listing in the National Register (HPSR Attachment B).

All other built environment properties within the project APE have been determined exempt from further evaluation pursuant to Attachment 4 of the Caltrans Section 106 PA as Property Types 2, 4, 5, or 6, which are properties that are modern construction, moved buildings, or historic-period construction that has lost integrity because of alterations.

VII. PREPARER QUALIFICATIONS

The architectural component of this study was undertaken by Architectural Historians Casey Tibbet and Eugene Heck. The archaeological component was conducted by Archaeologist Ivan Strudwick.

Casey Tibbet is the Principal Architectural Historian (Professionally Qualified Staff [PQS]) for this project. She earned her Master of Arts in Historic Preservation from the University of California, Riverside, and has been practicing architectural history and historic preservation in California since 2003. Ms. Tibbet assisted with development of the APE, conducted research and the architectural field survey, and completed the DPR forms and HRER. She also contributed to the HPSR.

Eugene Heck, who qualifies as a Principal Architectural Historian PQS, conducted research, assisted with the field survey, and provided information for the historic context.

Ivan Strudwick is the Principal Investigator for this project. He conducted the archaeological field survey and completed the ASR.

VIII. REFERENCES

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IX. DEPARTMENT OF PARKS AND RECREATION (DPR) 523 FORMS

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # ______
HRI # ______
Trinomial ______
NRHP Status Code 6Z
Other Listings ______
Review Code ______ Reviewer ______ Date ______

 Resource Name or #: 1003–1005 Marengo Place

P1. Other Identifier: APE Map Reference #2

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Orange **and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** *Anaheim, CA* **Date:** 1981 **T**5S; **R**10W; Section 10; S.B.**B.M.**

c. Address: 1003–1005 Marengo Place **City:** Santa Ana **Zip:** 92703

d. UTM: Zone: 11; ______mE/ ______mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate): APN 405-213-12

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This one-story vernacular duplex is situated on the east side of Marengo Place in a residential neighborhood. It is irregular in plan and surmounted by a low-pitched, cross-gabled roof sheathed with composition shingles and has narrow eaves. The exterior walls are covered with stucco. The asymmetrical, west-facing façade includes an attached south-facing garage, an enclosed breezeway, an aluminum-framed sliding window, a door, two more aluminum-framed sliding windows, and small recessed bay with a door. The west elevation of the garage features vertical boards above stucco skirting and a decorative, horizontal-rectangular feature made of angled wood slats. The doors and windows are covered with security screens and metal fences restrict access to the front of the property and the front of the house. The property is in fair condition and the duplex retains a moderate degree of integrity.

***P3b. Resource Attributes:** (List attributes and codes) HP3-Multiple family property

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) Façade, view to the northeast (4/4/19)

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both
1956 (Building Permit)

***P7. Owner and Address:**
Unknown

***P8. Recorded by:** (Name, affiliation, and address)
Casey Tibbet, M.A.
LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507

***P9. Date Recorded:**
April 4, 2019

***P10. Survey Type:** (Describe) Intensive-level Section 106 compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic Property Survey Report, Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project, City of Santa Ana, Orange County, California, Federal Project Number BRLS 5063(184), 2019.

***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) 1003–1005 Marengo Place

B1. Historic Name:
B2. Common Name:
B3. Original Use: Duplex **B4. Present Use:** Duplex
***B5. Architectural Style:** Vernacular
***B6. Construction History:** (Construction date, alterations, and date of alterations)
1956 – Permit issued to owner Lee Sievers for a 12-room duplex and garage.
1976 – Permit issued to owner W.H. Easley for a water heater.
1979 – Permit issued to owner Fairview/Venture to remodel windows, doors, and drywall.
1990 – Permit for reroof.
1993 – Plumbing permit for a water heater.
***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: Unknown **b. Builder:** Lee Sievers (owner/builder)
***B10. Significance: Theme:** Post World War II Development **Area:** City of Santa Ana
Period of Significance: 1956 **Property Type:** Multiple-family **Applicable Criteria:** NA
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This 1956 duplex does not meet the criteria for listing in the National Register of Historic Places or for listing in the California Register of Historical Resources. It was not evaluated under any local criteria for significance.

Historic Context. Refer to context in related report (see P11 above). *See Continuation Sheet*

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

Ancestry.com
Var. A variety of records were accessed online in April 2019 at: http://home.ancestry.com/. These include city directories, voter registration records, and United States Census Data.
California Department of Transportation
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City of Santa Ana
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Los Angeles Times
1963 Advertisement in Main Edition. April 14, page 138.
Newspapers.com
Var. Accessed online in April 2019 at: https://www.newspapers.com/search/.

B13. Remarks:

***B14. Evaluator:** Casey Tibbet, M.A., LSA Associates, Inc., 1500 Iowa Avenue, Suite 200, Riverside, California 92507

***Date of Evaluation:** April 2019

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

See Location Map

***B10. Significance:** (continued from page 2)

People Associated with this Property. According to building permits, the original owner/builder was Lee Sievers (City of Santa Ana var.). Sievers Construction Company was founded by Francis Lee Sievers (1913–2005; Ancestry.com var.). Sievers was an electrical contractor, working for his brothers' electrical business and living in Bellflower prior to World War II (Ibid.). In the post-war period, he obtained his general building contractor license and started his own business in Bellflower (Ibid.). An advertisement for his company in the Excelsior Union High School Yearbook of 1949 includes the company motto: "*Distinctive Styling in Modern Building"* (Ancestry.com var.). Sievers was an active home builder in Los Angeles and Orange Counties during the 1950s, 60s, and 70s. Although research findings to date are sparse, he appears to have specialized in small-scale residential projects (Newspapers.com var.). One notable project was Laguna Highlands Homes in Orange County. These custom two- and three-bedroom homes featured large garages, sundecks, spacious glass wall areas and kitchens with modern built-in gas ranges (*Los Angeles Times* 1963). Considering they were overlooking the ocean in the prestigious Arch Bay neighborhood, they appear to be relatively modest homes priced within reach of middle-income buyers (Ibid.).

No listing for Marengo Place was found in the 1956 city directory for Santa Ana. In 1960, 1003 Marengo Place was listed as vacant and 1005 Marengo Place was occupied by Lloyd A. Cribbs and his wife Julie (Ancestry.com var.). In 1953, Lloyd was a Sergeant in the United States Marine Corps (USMC) and remained in the USMC when he was living in the subject duplex in 1960 (Ibid.). In 1968, Lloyd was found guilty of the 1963 murder of his ex-wife's husband (*Independent* 1968).

In 1962, an obituary for Kaare Tomsen indicated that he lived at 1003 N. Marengo Place in Santa Ana (*Independent* 1962). Kaare Tomsen was born on March 24, 1896, in Denmark and died on June 14, 1962 (Ancestry.com var.). He was in the United States military during World War I and is listed as a marksman and as a Private in the Marine Corps (Ibid.). According to his 1940 Naturalization application Kaare married to Gladys in February 1932 and had five children (Ibid.). In 1940, they were all living in New York and Kaare listed his occupation as "refrigerator service" (Ibid.). In 1960, Kaare was living in Santa Ana on Bush Street, approximately 2.5 miles east of the subject property (Ibid.).

No additional information about residents or owners during the historic period was found.

Significance Evaluation. This property is being evaluated for listing in the National Register and California Register. Since the two sets of criteria are nearly identical, the evaluations have been combined to avoid redundancy.

Under criteria A/1, this duplex is associated with the post-WWII residential boom that made a significant contribution to the broad patterns of local, regional, and even national history. "More than 40 million housing units were built in the United States during the 30 year period following the end of World War II, and at least 30 million of these were single-family houses" (California Department of Transportation 2011:2). These homes were typically modest in size and style and constructed in a short time as part of large tracts marketed to the working class. "The fundamental unit for postwar housing is not the individual house, but the tract, or a single construction phase within a larger tract or new community" and typically a single home would not be individually significant in this context (California Department of Transportation 2011:121). As with most homes associated with this historic context, individually this residence is unimportant and insignificant. In addition, it does not appear to be a contributor to a potential historic district.

Under criteria B/2, very little information was found for the owners/residents of the duplex during the historic period, but there is no indication that it is associated with the productive life of a historically significant person.

Under criteria C/3, no information regarding the architect/designer of the duplex was found, but it does not appear to be the work of a master and does not possess high artistic values. Although typical of the early post-WWII period, it is not a distinctive example of an architectural style or building type and does not rise to a level beyond the ordinary.

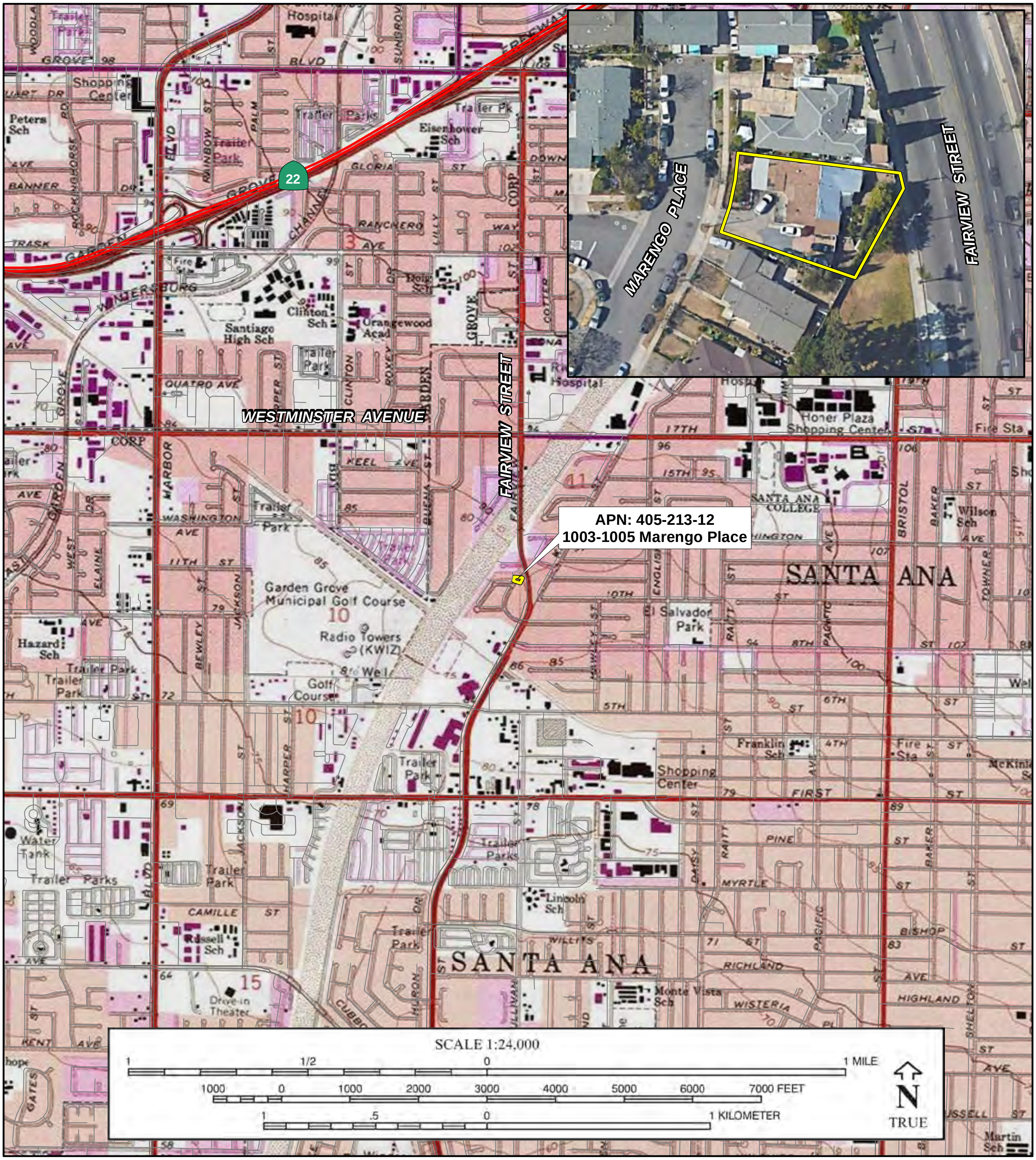
Under criteria D/4, the duplex was built in 1956 using common methods and materials and does not have the potential to yield important information in prehistory or history.

State of California - Resource Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI #
Trinomial

*Resource Name or # (Assigned by recorder) 1003-1005 Marengo Place

*Map Name: USGS 7.5' Quad, Anaheim & Newport Beach; Google Earth *Scale: 1:24000 *Date of Map: 1981; 2018



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # ____
HRI # ____
Trinomial ____
NRHP Status Code 6Z

Other Listings ____
Review Code ____ Reviewer ____ Date ____

 Resource Name or #: 1007–1009 Marengo Place

P1. Other Identifier: APE map reference #1

***P2. Location:** ☐ Not for Publication ☒ Unrestricted ***a. County:** Orange **and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** *Anaheim, CA* **Date:** 1981 **T**5S; **R**10W; Sections 10 and 11; S.B.**B.M.**

c. Address: 1007–1009 Marengo Place **City:** Santa Ana **Zip:** 92703

d. UTM: Zone: 11; ____ mE/ ____ mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate): APN 405-213-13

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This one-story Ranch style duplex is situated on the east side of Marengo Place in a residential neighborhood with numerous multifamily properties. It is irregular in plan and surmounted by a moderately-pitched, cross-hipped roof sheathed with composition shingles. It has narrow eaves above exterior walls clad with board-and-batten and stucco. The asymmetrical west-facing façade has a door with a security screen, a north-facing aluminum-framed sliding window, a west-facing aluminum-sliding window, a recessed door with a security screen, a sliding glass door, and an attached garage with doors facing north. The west elevation of the garage features a decorative wood accent. All of the windows have security bars. The property is in good condition and the duplex has sustained only minor alterations (windows).

***P3b. Resource Attributes:** (List attributes and codes) HP3-Multiple family property

***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) Façade, view to the east (4/4/19)

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both
1956 (Building permits)

***P7. Owner and Address:**
Unknown

***P8. Recorded by:** (Name, affiliation, and address)
Casey Tibbet, M.A.
LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507

***P9. Date Recorded:**
April 4, 2019

***P10. Survey Type:** (Describe) Intensive-level Section 106 compliance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Historic Property Survey Report, Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project, City of Santa Ana, Orange County, California, Federal Project Number BRLS 5063(184), 2019.

***Attachments:** ☐NONE ☒Location Map ☐Sketch Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 6Z

*Resource Name or # (Assigned by recorder) 1007–1009 Marengo Place

B1. Historic Name:
B2. Common Name:
B3. Original Use: Duplex **B4. Present Use:** Duplex
***B5. Architectural Style:** Ranch
***B6. Construction History:** (Construction date, alterations, and date of alterations)
1956 – Permit issued to owner Lee Sievers for a 12-room duplex and garage.
1979 – Permits issued for remodeling windows and doors, plumbing, and electrical.
1988 – Permit issued to Fire Department to repair damage from an auto.
2001 – Permit issued to reroof duplex.

***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:**
B9a. Architect: Unknown **b. Builder:** Lee Sievers (owner/builder)
***B10. Significance: Theme:** Post-World War II Development **Area:** City of Santa Ana
Period of Significance: 1956 **Property Type:** Multi-family **Applicable Criteria:** NA
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This 1956 Ranch style duplex does not appear to meet the criteria for listing in the National Register of Historic Places (National Register) or California Register of Historical Resources (California Register). It was not evaluated under any local criteria.

Historic Context. Refer to context in related report (see P11 above). *See Continuation Sheet*

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

Ancestry.com
Var. A variety of records were accessed online in April 2019 at: http://home.ancestry.com/. These include city directories, voter registration records, and United States Census Data.
California Department of Transportation
2011 Tract Housing in California, 1945–1973. A Context for National Register Evaluation. Caltrans Division of Environmental Analysis, Sacramento.
City of Santa Ana
Var. Building permits for 1007–1009 Marengo Place. On file at the Building Department.
Los Angeles Times
1963 Advertisement in Main Edition. April 14, page 138.
Newspapers.com
Var. Accessed online in April 2019 at: https://www.newspapers.com/search/.

B13. Remarks:

***B14. Evaluator:** Casey Tibbet, M.A., LSA Associates, Inc., 1500 Iowa Avenue, Suite 200, Riverside, California 92507

***Date of Evaluation:** April 2019

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

See Location Map

*Resource Name or #: (Assigned by recorder) 1007-1009 Marengo Place

*Recorded by LSA Associates, Inc. *Date: April 2019 X Continuation ___ Update

B10. Significance (continued from page 2)

People Associated with this Property. According to building permits, the original owner/builder was Lee Sievers (City of Santa Ana var.). Sievers Construction Company was founded by Francis Lee Sievers (1913–2005; Ancestry.com var.). Sievers was an electrical contractor, working for his brothers' electrical business and living in Bellflower prior to World War II (Ibid.). In the post-war period, he obtained his general building contractor license and started his own business in Bellflower (Ibid.). An advertisement for his company in the Excelsior Union High School Yearbook of 1949 includes the company motto: "*Distinctive Styling in Modern Building"* (Ancestry.com var.). Sievers was an active home builder in Los Angeles and Orange Counties during the 1950s, 60s, and 70s. Although research findings to date are sparse, he appears to have specialized in small-scale residential projects (Newspapers.com var.). One notable project was Laguna Highlands Homes in Orange County. These custom two- and three-bedroom homes featured large garages, sundecks, spacious glass wall areas and kitchens with modern built-in gas ranges (*Los Angeles Times* 1963). Considering they were overlooking the ocean in the prestigious Arch Bay neighborhood, they appear to be relatively modest homes priced within reach of middle-income buyers (Ibid.).

In 1956, there was no listing for Marengo Place in the Santa Ana city directory. In 1960, Clarence W. Wernick and his wife Marjorie are listed at 1007 Marengo Place and G.F. Cole is listed at 1009 Marengo Place (Ancestry.com var.).

Clarence W. Wernick, a welder at Regent Manufacturing in Downey in 1960, was born on May 11, 1920, in Illinois and died on March 19, 1997 (Ancestry.com var.). From 1937 to at least 1945, Clarence was in the United States Marine Corps (USMC) and was a platoon sergeant in the Pacific theater in 1945 (Ibid.). By 1962, voter registration records reveal that the Wernicks were no longer living in Marengo Place duplex (Ibid.). No additional information for the Wernicks or any other occupants of 1007 Marengo Place during the historic period was found. Similarly, no information about G.F. Cole or any other occupants of 1009 Marengo Place was found.

Significance Evaluation. This property is being evaluated for listing in the National Register and California Register. Since the two sets of criteria are nearly identical, the evaluations have been combined to avoid redundancy.

Under criteria A/1, this duplex is associated with the post-WWII residential boom that made a significant contribution to the broad patterns of local, regional, and even national history. "More than 40 million housing units were built in the United States during the 30 year period following the end of World War II, and at least 30 million of these were single-family houses" (California Department of Transportation 2011:2). These homes were typically modest in size and style and constructed in a short time as part of large tracts marketed to the working class. "The fundamental unit for postwar housing is not the individual house, but the tract, or a single construction phase within a larger tract or new community" and typically a single home would not be individually significant in this context (California Department of Transportation 2011:121). As with most homes associated with this historic context, individually this residence is unimportant and insignificant. In addition, it does not appear to be a contributor to a potential historic district.

Under criteria B/2, very little information was found for the owners/residents of the duplex during the historic period, but there is no indication that it is associated with the productive life of a historically significant person.

Under criteria C/3, no information regarding the architect/designer of the duplex was found, but it does not appear to be the work of a master and does not possess high artistic values. It is a typical example of the Ranch style that does not rise to a level beyond the ordinary.

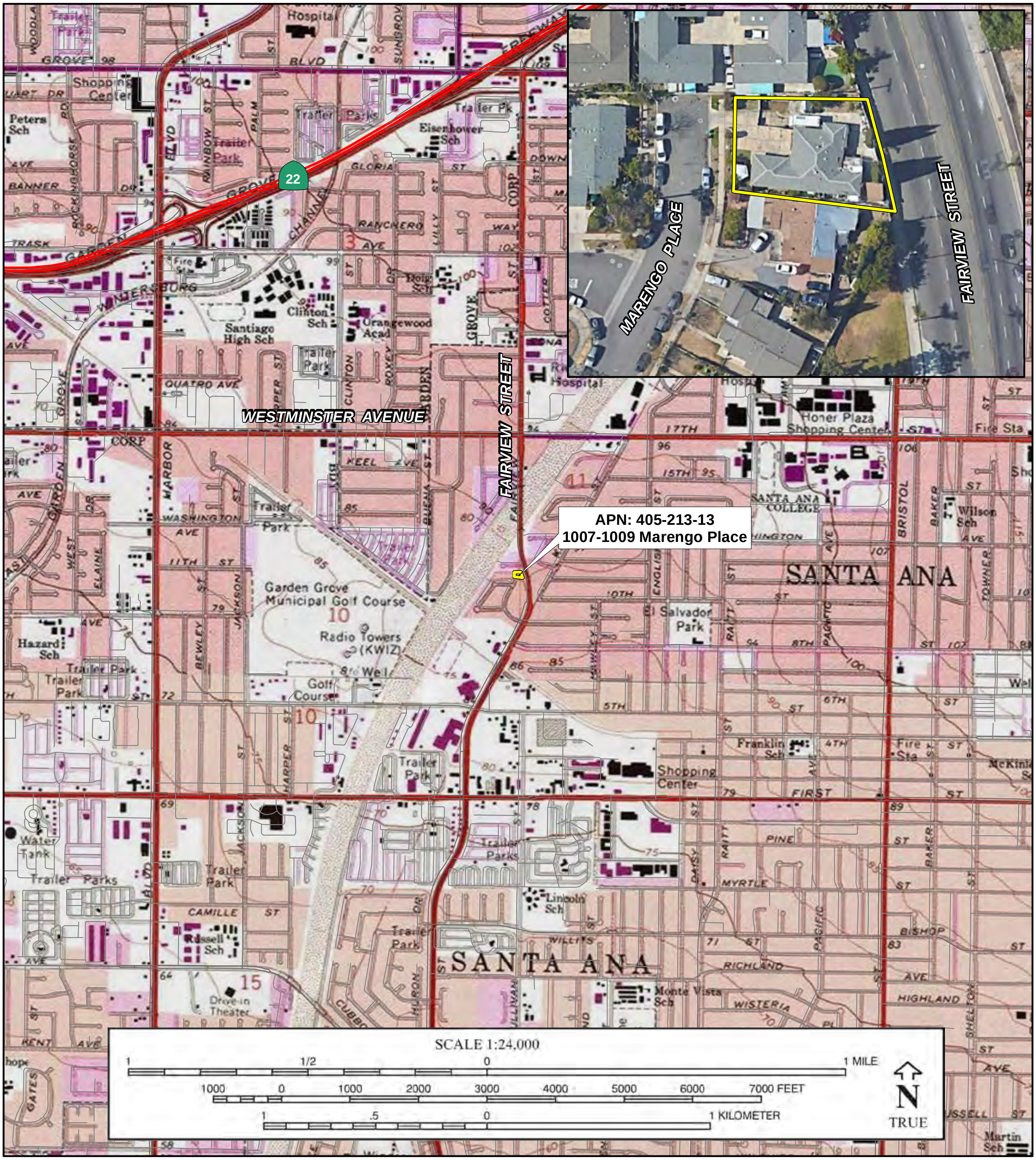
Under criteria D/4, the duplex was built in 1956 using common methods and materials and does not have the potential to yield important information in prehistory or history.

State of California - Resource Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # ______________________
HRI # ______________________
Trinomial ______________________

*Resource Name or # (Assigned by recorder) 1007-1009 Marengo Place

*Map Name: USGS 7.5' Quad, Anaheim & Newport Beach; Google Earth *Scale: 1:24000 *Date of Map: 1981; 2018



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Attachment D

Archaeological Survey Report (ASR)

ARCHAEOLOGICAL SURVEY REPORT FOR THE FAIRVIEW STREET IMPROVEMENTS FROM 9TH STREET TO 16TH STREET AND BRIDGE REPLACEMENT PROJECT SANTA ANA, CALIFORNIA FEDERAL PROJECT NO. BRLS 5063 (184)

Prepared by:

Ivan H. Strudwick, Associate/Archaeologist
Principal Investigator—Prehistoric and Historical Archaeology
LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614
(949) 553-0666

Reviewed by:

Jonathan Wright
District 12 Archaeologist
California Department of Transportation, District 12
1750 East 4th Street
Santa Ana, California 92705

Approved by:

Charles Baker
Environmental Planning Branch Chief
California Department of Transportation, District 12
1750 East 4th Street
Santa Ana, California 92705

Key Information

USGS Quadrangle: Anaheim, California 7.5' (1981)
Surveyed Area: 3.92 acres
Sites Recorded: None
Isolates Recorded: P-30-100233
Sites Updated: None

Keywords: Fairview Bridge, Gabrielino, Rancho Las Bolsas, Santa Ana River

June 2019

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TABLES

APPENDICES

SUMMARY OF FINDINGS

The City of Santa Ana (City), in conjunction with California Department of Transportation (Caltrans) District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (project) in Santa Ana, California (Appendix A, Figures 1 and 2). The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction that are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge. The Santa Ana River Trail (SART) runs on both sides of the Santa Ana River in the project area. The SART is a Section 4(f) Resource and would be temporarily closed during construction of the Project.

The Area of Potential Effects (APE) for this project totals 11.93 acres. The APE includes areas where physical impacts from the project would occur. These are generally limited to the project's proposed and existing right-of-way and include the horizontal and vertical limits associated with ground-disturbing activities. The vertical APE within the areas of direct effects will extend to a maximum depth of 15 feet for bridge abutments.

On March 16, 2018, a survey of 3.92 acres of the 11.93-acre APE was conducted to identify cultural resources. The APE is mainly paved, developed area, although patches of exposed sediment with some variation of ground visibility were found. One archaeological resource, an isolated fragment of marine shell, was found during the survey (P-30-100233). Under federal Section 106/National Historic Preservation Act and State of California Environmental Quality Act guidelines, isolated finds are not considered important/significant resources. Attachment 4 of the Caltrans (2014) Programmatic Agreement also states that isolated prehistoric finds consisting of fewer than three items per 100 square meters are exempt from evaluation. As such, the isolate shell fragment is not important and requires no additional evaluation for the current project.

It is Caltrans policy to avoid cultural resources whenever possible. Further investigations may be needed if the site[s] cannot be avoided by the project. If buried cultural materials are encountered during construction, it is Caltrans' policy that work stop in that area until a qualified archaeologist can evaluate the nature and significance of the find. Additional surveys will be required if the project changes to include areas not previously surveyed.

INTRODUCTION

On March 16, 2018, LSA archaeologist Ivan Strudwick conducted a field survey of 3.92 acres of the total 11.93-acre APE. The survey areas consisted of approximately 2,650 feet (ft) of Fairview Street between Westminster Avenue/17th Street and Civic Center Drive West in Santa Ana (Appendix A, Figures 1 and 2; *Historic Property Survey Report* [HPSR], Attachment A, Maps 1, 2, and 3). Since 1981, Mr. Strudwick has worked as an archaeologist in California and on California's Channel Islands. As an archaeologist at LSA since 1994, Mr. Strudwick is responsible for directing archaeological field excavations, surveys, lab analysis, monitoring, and report writing. Mr. Strudwick meets the Caltrans Cultural Resource Professional Qualification Standards for a Principal Investigator—Prehistoric and Historical Archaeology.

A record search for this project was conducted at the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS) by Assistant Coordinator Michelle Galaz on March 5, 2018. The SCCIC is at California State University, Fullerton.

HIGHWAY PROJECT LOCATION AND DESCRIPTION

The proposed project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge over the Santa Ana River. The proposed project would widen Fairview Street from two lanes in each direction to three lanes in each direction in the City of Santa Ana. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

The proposed bridge would be expanded from approximately 52 ft to 100 ft in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

The proposed project would acquire partial right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APN) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]). Although not known at this time, there is the potential for one full take at the single-family residence (APN 405-213-14) if the property owner is concerned about the loss of a portion of the side yard; this will be determined during final design in consultation with the property owner.

An existing 12-inch-diameter water line and a bank of 12 phone conduits are suspended under the deck of the existing bridge and span the Santa Ana River. These utilities would be temporarily relocated during construction and then permanently relocated to the new bridge.

Water quality best management practices would be included to treat stormwater runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bicyclists would be detoured away from the Fairview Street bridge to the 17th Street bridge to cross the Santa Ana River by way of the SART between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists wishing to cross the Santa Ana River would be detoured to adjacent City streets, such as King Street.

Construction of the proposed project would require temporary closures of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of SART affected by Project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detour are being coordinated with OC Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the river bed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the river bed.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the project area. All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to preconstruction conditions or better prior to project completion.

The vertical APE for the roadway extends to a depth of 2 feet, while bridge abutment excavation will extend to a depth of 15 feet. Additionally, excavation for utilities will extend to a maximum depth of 4 feet (HPSR, Attachment A, Map 3 – APE Map; also *Archaeological Survey Report* Appendix A, Figure 3 – Survey Coverage Map).

The APE is shown on the United States Geological Survey (USGS) *Anaheim, California* 7.5-minute topographic quadrangle map (USGS 1981) within Township 5 South, Range 10 West along the east side of the northeast quarter, as well as in the southeast quarter of Section 10. The APE is located between elevations of 88 and 98 feet. The highest elevation in the APE is on the banks, both north and south, of the Santa Ana River. The lowest elevation in the APE is at the southern end of the APE near Civic Center Drive. Although there is some elevation change due to the banks for the Santa Ana River, the landform in the vicinity is relatively level, with slope to the south-southwest.

AREA OF POTENTIAL EFFECTS

The APE encompasses 11.93 acres and includes all areas in which the project has the potential to directly or indirectly affect historic properties if any such properties exist (HPSR, Attachment A, Map 3). Physical project impacts are generally limited to the project's proposed and existing right-of-way and include the horizontal and vertical limits associated with ground-disturbing activities. The vertical APE within the APE will extend to a maximum depth of 15 feet for the bridge abutments.

Areas of indirect effects will extend beyond those of the direct effects and include areas that may be indirectly affected by visual, noise, and other effects. Areas of indirect effects generally include all properties directly adjacent to the proposed right-of-way unless they are undeveloped or unless potential indirect effects will be unlikely due to sufficient distance between the construction footprint and any development.

Approximately 3.92 acres of the APE was surveyed for archaeological resources (Appendix A, Figure 3–Survey Coverage Map). The area surveyed includes both undeveloped areas and areas covered with vegetation where underlying sediment was reasonably visible. Areas of the 11.93 acre APE not surveyed included Fairview Street and areas that are only subject to indirect impacts (such as buildings). The APE is highly disturbed from the historic construction and paving of Fairview Street, including excavation for buried utilities, channelization and concreting of the Santa Ana River, and development of the Santa Ana River trail.

SOURCES CONSULTED

ARCHIVAL RESEARCH

On March 5, 2018, a record search was conducted at the SCCIC of the CHRIS at California State University, Fullerton. The record search included a review of all recorded historic and prehistoric archaeological sites within a 1-mile 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 Historic Places (National Register)
- California Register of Historical Resources (California Register)
- California Historical Landmarks
- California Points of Historical Interest (CPHI)
- California Historic Resources Inventory (HRI)

The record search identified a total of 8 cultural resource studies that included various parts of the APE and an additional 31 studies that were conducted within 1 mile of the APE (Table A). Studies within the APE include surveys (4), literature searches (2), monitoring (1), and an Environmental Impact Statement (EIS) (1). These studies show that a portion of the APE has been surveyed, although the majority of the work was conducted in the 1990s and early 2000s. Three studies in close proximity to the APE included surveys (2) and an assessment (1). The remaining 28 studies outside of the APE are surveys (22), literature searches (2), evaluation/assessments (2), a project authorization (1), and an EIS (1).

Table A: Results of Record Search

Reference	OR No.[1]	Type of Study
Previous Studies in the APE		
Leonard and Hall (1975)	270	Survey
Langenwalter and Brock (1985)	801	Survey
Jertberg and Rosenthal (1997)	1639	Survey
Padon (1998)	1836	Literature Search
Salenius (1998)	4087	Environmental Impact Statement (EIS)
Bissell (2000)	4266	Survey
Bonner (2002)	2914	Literature Search
Becker et al. (2007)	4259	Monitoring
Previous Studies Adjacent to the APE		
Perry (1993)	2010	Survey
Ritchie (2000)	3371	Evaluation
Rogers (2011)	4195	Survey
Previous Studies Within 1 Mile of the APE		
OR Nos. 8, 233, 371, 456, 570, 683, 721, 761, 1070, 1101, 1126, 1223, 1234, 1417, 1488, 2261, 2600, 3202, 4364, 4574		

[1] OR is the Information Center code for Orange County, the county in which the study occurred. References are listed by OR number in Appendix B (Results of Record Search).
APE = Area of Potential Effects

The record search indicates that there are no previously recorded resource sites within the current APE; however, a total of 44 resources have been recorded within 1 mile of the APE. Two of these resources, the 1905 Pacific Electric Railroad Santa Ana River Bridge (P-30-161847) and the 1926 Hales-Hill Feed Warehouse (P-30-177031), are within 0.25-mile of the APE. Five resources, all buildings, are within 0.5 mile of the APE. The remaining 37 resources are more than 0.5 mile from the current APE.

The 44 historic resource sites identified by the record search outside the APE are prehistoric (1) and historic (43). The prehistoric resource is a now-destroyed habitation site, whereas the historic resources are the railroad bridge and 42 buildings. The buildings are differentiated by type. Listed in decreasing order of abundance, the buildings include single-family residences (28), commercial (10), single-family residence/commercial (1), hotel/motel (2), and a school (1).

Additional historic resources are listed in the OHP Historic Property Data File (HRI) for the cities of Santa Ana and Garden Grove. There are 18 listed properties in Santa Ana within 1 mile of the APE. All of these 18 properties are buildings constructed 1898–1955, but mainly from the 1920s through the 1950s. Seventeen of these buildings were determined ineligible for National Register listing, while 1 needs re-evaluation.

In Garden Grove, the OHP Historic Property Data File identifies 11 properties within 1 mile of the APE. These properties include buildings (9), an 1880 eucalyptus vat, and a 1976 storm drain. The storm drain was determined ineligible for National Register listing, while the eucalyptus vat needs re-evaluation. The nine buildings were constructed 1949–2000, but primarily in the 1950s. All were determined to be ineligible for listing in the National Register.

Provided with the record search are two A*naheim, California* 15-minute topographic quadrangle maps (USGS 1896, 1942). In addition to these maps, online topographic maps and aerial photographs were reviewed (www.historicaerials.com). Maps indicate that no buildings existed in the APE in 1896, although at that time, the map depicts both Santa Ana and Garden Grove. It is not until 1935 that an online map shows buildings at the north and south ends of what is now the APE, although neither Fairview Street nor the Fairview Street bridge existed.

A 1950 map of the area shows that, although buildings existed along major streets, most of the area in the vicinity of the project was in agricultural production. Earlier maps from the 1930s and 1940s that should identify agricultural use of the land and the initial growth of residential areas all appear to be editions of earlier maps. That is, maps from the 1930s and 1940s show characteristics of the area that existed ca. 1900, rather than what existed in the 1930s and 1940s. The single exception to this is the 1942 15-minute USGS map (*Anaheim, California*), provided with the record search. This map shows that the Santa Ana River was not channelized, although it appeared to have some type of reinforcement along the northern and southern banks. Five buildings exist in the vicinity of the APE, although 3 or 4 are probably outside the current APE. At this time (1942), Garden Grove Boulevard is also labelled State Route 22 (SR-22), and a paved road running alongside the Southern Pacific Railroad northwest from downtown Santa Ana is labelled U.S. Route 101 (US 101). Although the railroad continues southeast of Santa Ana, the adjacent road does not.

Further research identified the road running adjacent to the Southern Pacific Railroad as Firestone Boulevard, which was the first direct automobile route between Los Angeles and Santa Ana. This route first opened in 1935. It was known as US 101, and in 1953, it was expanded into the Santa Ana Freeway.

The earliest available online aerial photograph of the area dates from 1953. It shows that although there were residential housing tracts in the area, the land along what would become Fairview Street was still open agricultural land except at the north where Westminster Avenue/17th Street is, and at the south, where several buildings are just southwest of the current APE. A 1963 aerial photograph is the first to show Fairview Street and the Fairview Street bridge. By 1963, tract housing existed alongside the APE and the areas adjacent to the APE were more than half developed. A 1972 aerial photograph shows that the Fairview Street Bridge is much larger than that depicted on the 1963 aerial. The bridge on the 1972 aerial appears to be the currently existing bridge. By 1972, several undeveloped areas existed adjacent to the APE, although these did not exist in the next available aerial photograph dated 1995. Little change has occurred to the APE since 1995.

NATIVE AMERICAN CONSULTATION

The Native American Heritage Commission (NAHC) was contacted on February 9, 2018, to conduct a Sacred Lands File search for the APE. Gayle Totton of the NAHC responded on February 12, 2018. Ms. Totton advised that the results of the search were negative for Native American cultural resources in the project APE but recommended contacting 23 individuals representing the Gabrielino, Juaneño, Kitanemuk, Kumeyaay, Serrano, and Tataviam groups who may have knowledge of cultural resources in or close to the project APE. The following Native American contacts were notified of the project in letters sent by certified mail on March 27, 2018:

- Campo Band of Mission Indians, Ralph Goff, Chairperson
- Ewiiaapaayp Tribal Office, Michael Garcia, Vice Chairperson
- Ewiiaapaayp Tribal Office, Robert Pinto, Chairperson
- Gabrieleno Band of Mission Indians – Kizh Nation, Andrew Salas, Chairperson
- Gabrieleno/Tongva San Gabriel Band of Mission Indians, Anthony Morales, Chairperson
- Gabrielino/Tongva Nation, Sandonne Goad, Chairperson
- Gabrielino Tongva Indians of California Tribal Council, Robert Dorame, Chairperson
- Gabrielino-Tongva Tribe, Charles Alvarez
- Jamul Indian Village, Erica Pinto, Chairperson
- Juaneño Band of Mission Indians, Sonia Johnston, Chairperson
- Juaneño Band of Mission Indians Acjachemen Nation – Belardes, Joyce Perry, Tribal Manager
- Juaneño Band of Mission Indians Acjachemen Nation – Belardes, Matias Belardes, Chairperson
- Juaneño Band of Mission Indians Acjachemen Nation – Romero, Teresa Romero, Chairperson
- La Posta Band of Mission Indians, Gwendolyn Parada, Chairperson
- La Posta Band of Mission Indians, Javaughn Miller, Tribal Administrator
- Manzanita Band of Kumeyaay Nation, Angela Elliott Santos, Chairperson
- San Fernando Band of Mission Indians, John Valenzuela, Chairperson
- San Pasqual Band of Mission Indians, John Flores, Environmental Coordinator
- San Pasqual Band of Mission Indians, Allen E. Lawson, Chairperson

- Sycuan Band of the Kumeyaay Nation, Cody J. Martinez, Chairperson
- Sycuan Band of the Kumeyaay Nation, Lisa Haws, Cultural Resources Manager
- Viejas Band of Kumeyaay Indians, Robert Welch, Chairperson
- Viejas Band of Kumeyaay Indians, Julie Hagen

One initial response was received as a result of the project notification letter. Andrew Salas, Gabrieleno Band of Mission Indians – Kizh Nation sent a response letter via email on March 29, 2018, to request consultation. That same day, a response was sent to him, requesting additional and more specific information regarding the sensitivity of the project area. Mr. Salas responded with an invitation to meet at the Tribal office, to which a response was sent that the Tribal office is too far and instead offering a teleconference option.

On March 30, 2018, an additional email response was received from Mr. Salas. In this email, Mr. Salas requested contact from the lead agency and copied the NAHC on the message. This request was forwarded to Caltrans, who responded on April 4, 2018. The response from Caltrans (which copied the NAHC) was an effort to reach out and request any information about knowledge of specific resources in the project area. Caltrans also reiterated that a teleconference is an option and offered to schedule a time for the teleconference if the group was interested.

On April 12, 2018, Caltrans sent another follow-up email to Mr. Salas to offer a teleconference option to discuss the project and address any questions or concerns that the group may have. No further response from Mr. Salas' group was received.

On April 11, 2018, a response letter dated April 2, 2018, was received from Ray Teran, Resource Manager for the Viejas Band of Kumeyaay Indians. This letter stated that the project has little cultural significance or ties to Viejas, and requested that they be informed of any inadvertent discoveries.

Follow-up communications were attempted on two different days: phone calls were made on April 5, 2018, and follow-up emails were sent on April 10, 2018. No responses or comments were received as a result of the follow-up communications.

For additional details of the Native American consultation, please see the HPSR, Attachment D.

BACKGROUND

The natural setting of the project vicinity is presented based on the underlying theoretical assumption that humans interact constantly with their physical environment. As part of the ecosystem, humans respond to the limits imposed by the environment through technological and behavioral adaptations. The location of archaeological sites is based on the constraints of these interactions, whether it is proximity to necessary resources, topographical restrictions, or based on a need for shelter and protection. Sites will be located and contain an assemblage of artifacts and ecofacts consistent with this interaction.

ENVIRONMENT

The project lies in the central portion of Orange County, 9 miles northeast of the Pacific Ocean's coast at Huntington Beach. The natural surface geology of the APE is recent Holocene colluvium and alluvium, less than 10,000 years old (Morton and Miller 1981). The APE lies at an elevation of 88 to 98 feet and is within what was once part of the riparian woodland and coastal sage scrub (CSS) vegetative communities (Jaeger and Smith 1966:43-44).

The climate of Southern California is the product of cold ocean water and warm air, a combination of maritime and Mediterranean climates. The maritime influence causes a persistent marine layer resulting in haze or fog—and even smog—when a multitude of motorized vehicles runs under these climatic conditions. The Mediterranean climate is characterized by long, hot summers and relatively mild winters with moderate precipitation, including snow at upper elevations (Jaeger and Smith 1971:18–19; Schoenherr 1992:313). During summer, Southern California often exhibits high atmospheric pressure that prevents cloud formation and precipitation except for the occasional tropical storm from the south (Schoenherr 1992:316). Winter storms generally come from the northwest. Coastal Orange County annually averages 12 inches of rain (Beck and Haase 1974:5). Winter rain is followed by spring fogs giving way to summer haze and smog. The average minimum January temperature for the coastal Orange County region is 45 degrees Fahrenheit (°F), while the average high temperature in July is 74°F (Beck and Haase 1974:6–7). Summer temperatures are often in the 80s and 90s. Fall brings Santa Ana winds that blow from the California deserts to the coast. These winds increase in temperature from compression as they blow from higher desert elevations toward lower coastal elevations.

The term *Southern California* refers to the southwestern portion of the State where rapid urbanizing is covering coastal lowlands. The word *cismontane* means "this side of the mountain," and the cismontane area of Southern California describes the coastal side of the Transverse and Peninsular Ranges, specifically the alluvial outwash that includes most of Los Angeles and Orange counties (Schoenherr 1992:313). Southern California's most common vegetative communities are scrub vegetation known as CSS and chaparral, which denote habitat characterized by dense stands of brush. Scrub vegetation occurs throughout the world in regions containing a Mediterranean climate (Schoenherr 1992:313). Within the APE located in central Orange County, the principal vegetation was originally coastal sagebrush, which occurs below elevations of 3,000 feet, usually below chaparral (Beck and Haase 1974:8). During summer and fall months, coincident with Santa Ana winds, scrub becomes extremely dry and susceptible to fire. Over millennia, the chaparral and CSS vegetative communities have evolved in conjunction with fire and require periodic burning for proper growth.

Riparian communities occur along watercourses (Schoenherr 1992:153). The riparian (streamside) woodland vegetative community is found along streams leading from mountains to cismontaine plains. Examples of this biotic community in Southern California include the Santa Inez, Santa Clara, Santa Ana, and San Luis Rey rivers (Jaeger and Smith 1966:43). In California, the riparian communities are characterized by small trees and large shrubs, although at higher elevations, vegetation tends to be all shrubs.

The density and diversity of species in a riparian community are greater than in any other biotic community in California (Schoenherr 1992:153). The reasons for this are twofold. First, riparian communities are very productive and "lots of food means lots of animals" (Schoenherr 1992:153). Secondly, riparian communities are transitional communities where biotic communities overlap. Zones where biotic communities overlap are known as "ecotones," and these areas share characteristics of the overlapping communities and are therefore diverse. In fact, "the edge of a community is more diversified than its center, a phenomenon also known as "edge effect" (Schoenherr 1992:153). For this reason, passing through the portion of the Los Angeles Plain now in Orange County, the Santa Ana River would have provided water and an abundance of food resources to the local native inhabitants. As it neared the ocean, the estuaries and embayments created by the Santa Ana River would have also provided habitat for shellfish that were collected for food by local human populations.

Water was also available in Santiago Creek, which joins the Santa Ana River 1 mile northeast of the current APE. Located approximately 6 miles north of the APE, Carbon Creek also provided water seasonally. However, the main drainage through the coastal plain in this region was the Santa Ana River.

Today, the biotic character of this area has been completely altered from its natural setting by a number of land uses, including commercial/industrial, residential, and infrastructure. At the APE, the Santa Ana River is a concrete-lined channel. Natural vegetation along the drainage and elsewhere in the area has been cleared for construction of homes and businesses that completely cover the landscape. Areas with completely natural terrain and vegetation no longer exist. There are few open lots. Where small areas with endemic vegetation do exist, such as the small triangular 1–1.5-acre lot on the south side of the Santa Ana River along the west side of Fairview Street, the vegetation has been artificially reintroduced and is a human construct. Although the likelihood of prehistoric resources existing along the banks of the river were probably great in the past, it is highly unlikely that intact archaeological resources currently exist within the APE.

CULTURAL HISTORY

Prehistory

Of the many chronological sequences proposed for Southern California, the primary regional synthesis most commonly used was advanced by Wallace (1955) and revised two decades later (Wallace 1978). This sequence defines four cultural horizons or periods, each with characteristic local variations: Early, Milling Stone, Intermediate, and Late Prehistoric periods. Employing an ecological approach, a second regional synthesis was employed by Warren (1968), who viewed cultural continuity and change in terms of adaptation to various significant environmental changes that define the cultural ecological approach to archaeological research of the California deserts and coast.

Many changes in settlement patterns and subsistence focus within both sequences are viewed as cultural adaptations to a changing environment, and are thought to have resulted in changing artifact types. For instance, the large, heavy projectile points used with spears and darts (spear points) throughout most of prehistory gave way to smaller projectile points (arrowheads) used with the bow-and-arrow in the Late Prehistoric Period. In inland areas, and nearer the coast south of what is now San Clemente, ceramic pottery also appeared during the Late Prehistoric Period. These changes and the introduction of other artifacts occurred over time during prehistory.

Ethnography

The Late Prehistoric Period ended in 1769, when Franciscan friars and Spanish soldiers began establishing mission outposts along the California coast. At that time, the project area was occupied by the Gabrielino Indians. Gabrielino refers to the Shoshonean (Takic) speaking Native Americans who lived throughout Los Angeles, western San Bernardino and Riverside, and Orange counties, and who were historically affiliated with Mission San Gabriel Archangel. Some of these Shoshonean people also called themselves *Tong-va* (Johnston 1962; McCawley 1996).

The Gabrielino were hunters and gatherers who used both inland and coastal food resources. They caught and collected seasonally occurring food resources and evolved a semi-sedentary lifestyle, living in permanent and semi-permanent villages along inland watercourses and coastal estuaries. These villages took advantage of the varied resources available at such locales. Seasonally, as foods became available, the Gabrielino moved to temporary gathering camps and collected plant foods such as acorns, buckwheat, chía, berries, or fruits. They also periodically established camps along the coast or at estuaries to gather shellfish or to hunt waterfowl (Hudson 1971; McCawley 1996).

The Gabrielino lived in small, semi-permanent villages that were the focus of family life. Patrilineally linked extended families lived within each village (Kroeber 1925; Johnston 1962; Bean and Smith 1978). These kin groups were affiliated in several village clans. Both the clans and the villages were apparently exogamous, as Mission records suggest that after her marriage, a woman resided at her husband’s village.

Gabrielino villages were politically independent even when marriage ties existed. The village was administered by a headman who inherited his position from his father. Shamans guided religious and medical activities, and group hunting or fishing was supervised by individual male specialists.

An active and elaborate Gabrielino ritual system was present when the Spanish padres arrived to establish Mission San Gabriel. Rituals included individual rites of passage, village rites, and participation in the widespread *Chingichngish* cult. The cult of the culture hero, *Chingichngish*, was observed and recorded by Franciscan Friar Gerónimo Boscana while he resided at Missions San Juan Capistrano and San Luis Rey (Harrington 1933, 1934; Boscana 1933; Hanna 1933).

History

Spanish Mission Period (1769-1821)

The Historic Period in southern California is generally accepted as commencing with the establishment of Mission *San Diego De Alcalá*, and the period from 1769–1821 is often referred to as the Spanish Mission Period (Robinson 1979:51–52). The period begins in 1769 with the Portolá expedition of 1769–1770 and ends in 1821, when Mexico gained independence from Spain (McGroarty 1911:117, 148; Avina 1932:29; Robinson 1979:13). Little Spanish exploration of the California coast occurred between the early 1600s and 1769 due to the limited naval resources available to Spain after the defeat of the Spanish Armada by the English fleet in 1588. In response to Russian incursions down the coast from Alaska in the mid-1700s, Spain realized the necessity of occupying *alta* (upper) California. Beginning with the Portolá expedition of 1769–1770, Franciscan missions were established along coastal California between San Diego and Sonoma, and the Spanish colonization of *alta* California began.

Founded July 16, 1769, Mission *San Diego De Alcalá* was the first and southernmost of 21 *alta* California Missions (Lowman 1993:2, 5). The mission was founded during the first European land expedition through California, led by Captain Gáspar de Portolá in 1769–1770 (Cleland 1962:xi). Entering what is now the Orange County area on July 22, 1769, the expedition travelled north along the coast, and at times inland, in search of Monterey Bay, which had been described by Sebastián Vizcaíno as an excellent port when he anchored there on December 16, 1602 (Cleland 1962:xi; Lowman 1993:3; Gudde 1998:246). Mission *San Gabriel Arcangel*, the nearest of the missions to the current project area, was the fourth California mission, founded September 8, 1771 (Hoover et al. 1962:12; Lowman 1993:2; McCawley 1996:189).

In the Orange County area, the first recorded contact between the Gabrielino and Europeans occurred on July 22, 1769, when the Portolá Expedition camped for the night near a native village in Christianitos Canyon north of San Onofre. Two little native girls, who were ill, were baptized and the expedition named the location "Los Christianitos," meaning the little Christians (Hoover et al. 1962:29).

Traveling west of the Santa Ana Mountains, on July 25, 1769, the Portolá Expedition camped near a stream now known as Santiago Creek (Hoover et al. 1962:29), just northeast of what is now the City of Orange, near what is now the City of Villa Park. On July 28, 1769, the expedition reached the Santa Ana River and pitched camp "… opposite an Indian village" (Hoover et al. 1962:29), near where Olive is now located and where State Route 91 meets State Route 55. These two locations on Santiago Creek and the Santa Ana River are 7–8 miles from the current APE. The closest the Portolá Expedition came to the current project is probably a short distance north on Red Hill, about 6 miles from the APE.

Mexican Rancho Period (1821–1848)

In 1821, Mexico gained independence from Spain, and in 1848, the United States formally obtained California. The period from 1821 to 1848 is here referred to as the Mexican Rancho Period (see Robinson 1979:52). During this period, there was a change from the subsistence agriculture of the Spanish Mission Period to livestock husbandry of the large ranches, or *ranchos*, acquired by Mexican citizens through grants or by purchase from mission administrators. It was also during this period that large tracts of land termed *ranchos* were granted by the various Mexican Governors of *alta* California, usually to individuals who had worked in the service of the Mexican government.

American Period (1848–Present)

Following the end of hostilities between Mexico and the United States, the United States officially obtained California in the Treaty of Guadalupe Hidalgo on February 2, 1848 (Cleland 1962:xiii). In 1850, California was accepted into the Union of the United States, mainly due to the population increase created by the Gold Rush of 1849. In the years immediately following the United States' acquisition of California, the cattle industry reached its greatest prosperity due to the massive influx of immigrants during the Gold Rush (Cleland 1952:102–108; Liebeck 1990:2–3). Mexican Period land grants had created large pastoral estates in California, and a high demand for beef during the Gold Rush led to a cattle boom that lasted until 1855. In 1855, however, the demand for California beef began to decline as a result of sheep imports from New Mexico, cattle imports from the Mississippi and Missouri Valleys, and the development of stock breeding farms. When the beef market collapsed, California ranchers were unprepared. Many had borrowed heavily during the boom, mortgaging their land at interest rates as high as 10 percent per month. The collapse of the cattle market meant that many of these ranchos were lost through foreclosure, while others were sold to pay debts and taxes (Cleland 1952:108–114).

Land Grants

Beginning in 1784, Spanish army officers and veterans living in California began receiving land concessions and establishing large, private grazing areas (Cowan 1993:8). Cattle ranching was highly profitable during the Spanish and Mexican Periods. There were only 25–32 major "grants" made during the Spanish Period, and these were actually concessions that were little more than grazing and settlement permits, because title of ownership remained with the crown (Beck and Haase 1974:24; Cowan 1993:8). However, several hundred land grants were made by Mexican governors of California during the Mexican Period.

An early Spanish Period concession of approximately 60,000 acres known as *Rancho Santiago de Santa Ana* was made in 1801 or 1802 by then Governor Arrillaga to José Antonio Yorba and his father-in-law, Juan Pablo Grijalva. In 1810, a second concession of this land was made by Governor Arrillaga to Antonio Yorba and Pablo Peralta (Avina 1932:25; Meadows 1966:117; Shumway 1993:59-60). This is the only Spanish Period concession located entirely within Orange County. The name, *Santiago de Santa Ana*, is derived from the Santa Ana River and Santiago Creek, both named by the Portolá Expedition, and means "Saint James of Saint Ann" (Meadows 1966:117).

The American Period patent for the 78,941.49-acre *Rancho Santiago de Santa Ana* was issued in 1883 to Bernardo Yorba and other heirs to Antonio Yorba and Pablo Peralta (Shumway 1993:59-60). This grant abuts the current APE on its southeastern edge. However, the current APE is just west edge of the middle of the *Rancho Santiago de Santa Ana* grant.

The APE is within the *Rancho Los Nietos* Spanish Period concession, which was a grant of approximately 300,000 acres made in 1784 by Governor Fages to Manuel Nieto (Beck and Haase 1974:Map 37; Shumway 1993:58). It is described as all the land lying between the Santa Ana and San

Gabriel Rivers from the mountains to the sea (Hoover et al. 1962:15). Later, *Rancho Los Nietos* was divided among Nieto's five heirs. The five ranchos created by this division were Santa Gertrudes, Los Coytoes, Los Cerritos, Los Alamitos, and Los Bolsas. *Rancho las Bolsas* (pockets or low spots) is the only one of these five ranchos now part of Orange County.

In 1833, during the Mexican Period, the *Rancho los Nietos* concession was granted by Governor Figueroa to the heirs of Manuel Nieto, and in 1834, 7 leagues were regranted as *Rancho las Bolsas* by Governor Figueroa to Doña Catarina Ruiz, widow of Manuel Nieto (Meadows 1966:115; Shumway 1993:58). In 1874, the American Period patent for 33,460 acres was issued to Ramón Yorba, Dominga Yorba, Soledad Yorba de Abila, Dominga Yorba de Aguilar (wife of Chavis Aguilar), and Julián Aguilar (Shumway 1993:58).

The APE is 1.75 miles southwest of the northeasternmost point of *Rancho las Bolsas*, which extends from the location where SR-22 crosses the Santa Ana River south-southwest to the coast. The eastern boundary of the grant generally follows the Santa Ana River. The Bolsa Chica area (Spanish for little pocket; Meadows 1966:29) is included in the *Rancho las Bolsas* grant and is where the grant obtained its name. The word *bolsa* is used in a geographical sense for a semi-enclosed or shut-in place, often a neck of land surrounded by water (Gudde 1998:42), or pockets of dry land surrounded by a swamp (Meadows 1966:29, 115). The word was widely used during the Mexican Period and was the first or second name in no fewer than 24 land grants and claims.

The cattle industry collapsed in the late 1850s and early 1860s due to drought and the resulting poor economic conditions. Afterwards, sheep ranchers began to proliferate. James Irvine began to purchase land just southeast of the current project, and gained a controlling interest in the wool industry through his purchase of Flint, Bixby & Company and eventually owned all of *Rancho San Joaquin, Rancho Lomas de Santiago,* and *Rancho Santiago de Santa Ana*, which eventually became known as the Irvine Ranch (Cleland 1941, 1952; Meadows 1966:115, 117; Liebeck 1990:2–4, 6–14).

In 1842, Abel Stearns obtained *Rancho los Alamitos*. By 1860, Stearns owned a total of seven Mexican Period land grants in Southern California, including *Rancho las Bolsas*, making him one of the wealthiest landowners in the area. However, the drought of 1863–1864 caused Stearns to lose an estimated 50,000 cattle, a severe economic hardship. In order to obtain capital necessary to survive, in 1868 Stearns formed a real estate partnership with Alfred Robinson, and four other San Francisco investors known as the Robinson Trust. The era of cattle ranching was ending and cattle ranches were being replaced by agricultural farmsteads. The Robinson Trust acted as sales agents subdividing rancho lands. By 1870 Stearns had escaped his debts caused by the drought of the 1860s, although he died soon afterward on August 23, 1871.

It was the sale of former land grant acreage for farmsteads that eventually led to further subdivision and the creation of residential communities on what was agricultural land in the immediate past, and cattle ranches in the more distant past. Today, the once open expanse of *Rancho los Nietos* is now a fully developed built-environment containing a sea of commercial and residential areas, whereas open, undeveloped lots are the rare exception. The cities of Garden Grove, Westminster, Fountain Valley, Huntington Beach, and parts of Santa Ana are all in what was once *Rancho las Bolsas* (Meadows 1966:115).

Place Names

Fairview

In October of 1877, 1,762 acres of land was purchased and the town site of Fairview laid out south of Santa Ana and north of Newport Bay (Meadows 1966:62). A large boulevard, now Fairview Street, was opened. A 50-acre business and residential area was set aside around a warm artesian well, with the remaining acreage intended as farmland. A hotel, stores, church, school, and public swimming "plunge" were constructed. A railroad was also built between Santa Ana and the new town of Fairview. On April 3, 1888, a post office was established with I. Wellington Gardiner as the first postmaster (Salley 1977:72).

By October 1888, the town had a population of 1,200. However, the basis of the town was loans, and by 1889, the promoters faced financial ruin after the real estate boom reversed in late 1888. In February 1889, the railroad was washed out by heavy rains. By April of 1889, the community had lost half of its inhabitants and by the end of the year the town was almost a ghost town. The paper folded, and by May 1903, the post office closed and the hotel was demolished for its lumber (Meadows 1966:62). By 1910, the area had reverted to agricultural fields. Fairview is depicted on the 1896 15' *Santa Ana, California* USGS (1896) map.

During WWII, the Santa Ana Army Air Base was established on land that was once part of Fairview. Shortly after WWII, Orange Coast College acquired some of this land. Today, the college library is 600 yards east of where the Fairview Hotel and the plunge had once been (Meadows 1966:62).

Garden Grove

As a place name, the word *garden* is used generically throughout the United States. In California, there are a dozen such named communities (Gudde 1998:140). The Orange County city was originally a farming community and Garden Grove was a real estate promotion name (Salley 1977:82).

The town of Garden Grove was founded in 1876 when Dr. A.G. Cook and Converse Howe laid out the town around a church and a schoolhouse near the intersection of Euclid Avenue and Garden Grove Boulevard. Howe built a general store on the southeast corner of the intersection and on March 16, 1877, a post office named Garden Grove opened in the building (Meadows 1966:66). David W. Webster was the first postmaster (Salley 1977:82). The town continued as an agricultural community until after WWII, when it began several years of spectacular growth, much of it based on servicemen settling in California after having been brought to the area during the war. The City incorporated on June 18, 1956 (Meadows 1966:66).

Red Hill

Spanish Period land concessions and Mexican Period Ranchos were often marked by readily identifiable physiographic landforms, and Red Hill was an important landmark during these and earlier times. Located at an elevation of 349 feet about 6 miles east of the APE, Red Hill is an isolated hill, forming the southwestern point of Loma Ridge that is a "mass of red and ochre-colored rocks" (Meadows 1966:118). It was the eastern boundary of *Rancho Santiago de Santa Ana*, and as well as the western boundary of *Rancho Lomas de Santiago*. It is also the northwest corner of

Rancho San Joaquin, which separates *Rancho Santiago de Santa Ana* and *Rancho Lomas de Santiago* in this area.

Red Hill was known by the natives as *Katuktu*, by the Spanish as *Cerro Colorado* (Red Hill) and *Cerrito de las Ranas* (Hill of the Frogs) (Hoover et al. 1962:30; Meadows 1966:118). Its redness is caused by cinnabar, or mercury ore. In 1884, a quicksilver mine existed on the southwestern edge of Red Hill that was improved in 1927. The mine was further improved during World War II, although there is no record of its being worked after World War II. Red Hill is California Registered Landmark No. 203.

California Place Names (Gudde 1998:311) states that with more than 550 mapped names that include the word red, that … "next to 'black,' 'red' is the most common adjective of color used in place names." Usually the word describes "hills, peaks, cliffs, and points, named after red features or because the soil appears red. As such, the name is the logical result of soil color."

Santa Ana

On July 28, 1769, the Portolá Expedition reached what is now known as the Santa Ana River and camped there (Hoover et al. 1962:29). The padres named the stream *el dulcísimo nombre de Jesús de los Temblores* (the most sweet name of Jesus of the Earthquakes), although the soldiers called it *Río de Santa Ana*. The name honors St. Anne, mother of the Virgin Mary (Gudde 1998:344). This is the only time that the soldiers of the Portolá Expedition applied a holy name to a place (Gudde 1998:344).

The City of Santa Ana was founded in 1868 by William H. Spurgeon. The City was named after the land grant on which it was located, *Rancho Santiago de Santa Ana*, the name taken from the river. The City incorporated June 1, 1886 with a population of 2,000. At the time, the area was still part of Los Angeles County. Santa Ana became the county seat in 1889, when Orange County was established (Maslin 1911:316; Meadows 1966:123; Salley 1977:123). The first post office in Santa Ana was established July 5, 1870. The first postmaster was William Spurgeon, and the post office was a partitioned wooden box in Spurgeon's store (Salley 1977:197).

Santa Ana was the home of the original Glenn L. Martin aviation company that was founded in 1912, prior to its merger with the Wright Company in 1916. Later, Glen Martin founded a second company in Cleveland, Ohio that eventually merged with Lockheed Corporation, forming the world's largest defense contractor: Lockheed Martin.

Santa Ana is also the namesake of the Santa Ana Army Air Base, activated January 1, 1942, during World War II and decommissioned in 1946. The base was on 1,336 acres now in Santa Ana and Costa Mesa between Harbor Boulevard and Newport Boulevard. Part of the area included what is now John Wayne International Airport, formerly Orange County Airport, which before that was known as Martin Field. The Santa Ana Army Air Base began as an induction center for the Air Corps Replacement Training Center's new recruits. As such, it was a huge basic training camp for future pilots, navigators, bombardiers, and other air corps-related specialties.

Plans called for 177 buildings including barracks, supply buildings, administration buildings, mess halls, officer's quarters, motor repair shop, post office, service station, recreation buildings, theater, commissary, chapels, fire station, guard houses, and a hospital. However, the base did not have a flying field as part of its facilities. Cadets received basic ground and pre-flight training prior to advancement to an aviation school for flight training. A total of 149,425 individuals passed through the Santa Ana Army Air Base. In late 1945, Japanese aliens from World War II internment camps were also housed at the Air Base before they were returned to Japan. The base was deactivated on May 4, 1946. John Wayne Airport, Orange Coast College, Southern California Bible College, several public schools, and the OC Fairgrounds are all on parts of the old Army Air Base (Meadows 1966:124).

Today, Santa Ana, with a population of approximately 335,000, is the second-most populous city in Orange County, second only to Anaheim, population 351,000. Santa Ana is the 11th most populous city in California.

FIELD METHODS

On March 16, 2018, a pedestrian survey of portions of the APE was completed. Because much of the project area is within Fairview Street right-of-way, the survey did not take place in all areas. Areas of exposed ground, even if vegetated, were surveyed by walking linear transects separated by 7 to 10 meters (23 to 33 feet) over larger areas and opportunistically over smaller areas. Special attention was given to larger areas that exhibited exposed sediment, such as alongside the Santa Ana River bike trail. Areas within the APE that were not surveyed included the central portion of the street. Due to project access along the sidewalk, the sidewalk was surveyed, with focus being the many open areas where palm trees are planted, as well as lawns and other open areas with and without vegetative cover.

SURVEY RESULTS

GENERAL OBSERVATIONS

The survey resulted in finding one isolated fragment of *Chione californiensis* (California Venus clam) in an open area along the west side of Fairview Street just south of the bridge (P-30-100233; Appendix C). No other cultural material was observed anywhere else in the APE.

Across the majority of the survey area along both sides of Fairview Street, there are small open rectangular areas in the sidewalk that exist for trees. Some of these open areas still contain trees, some are open with no trees, and a few have been cemented closed to form solid sidewalk. These rectangular areas measure approximately 3x3 ft. Sediment in these open areas shows that substrate throughout the APE is alluvial sand with some small pieces of rounded to sub-rounded gravel.

The largest open area of exposed sediment in the APE occurs along the south bank of the Santa Ana River. Here, the Santa Ana River bike trail exists. The concrete sidewalk ends a short distance south of the riverbank and exposed sediment exists on both the east and the west sides of Fairview Street. On the east side of Fairview Street, almost no vegetation exists in a small area of sandy alluvial sediment that was deposited here during flood episodes. Along the bike trail, the trail is concrete near the bridge and a paved asphalt access road leads from the road to the trail. Several hundred granitic rocks abut the bridge footing, and several trees are growing in open areas.

On the west side of Fairview Street, a mirror image of the east side exists with an asphalt access road, granitic rocks, and trees growing in open areas. South of the trail is a small undeveloped triangular area of about 1–1.5 acres that is a rest area for those using the bike trail along the south side of the river. Most of this triangular area is west and outside of the current APE, but the eastern edge of the triangular area, approximately 280 ft long (north-south) by 22 ft wide (east-west) is open. The paths through this area are introduced decomposing granitic (DG) sediment that is yellow in color. When compacted, the DG holds its shape extremely well and does not erode. Non-trail areas here have been vegetated from seed with native plant species. Areas between plants are covered with a thin layer of bark, but the bark does not always cover the ground, and there are open areas of native sand with 100 percent ground visibility.

In one of the open areas of the bike trail rest area with 100 percent ground visibility, a small fragment of *Chione californiensis* shell was found on the surface. The shell was found at the outer west edge of the APE, approximately 38 ft north of the brick wall forming the southern boundary of the undeveloped triangular bike trail rest area. It is not clear if the lone shell piece was left here prehistorically or was washed here from a deposit upstream during a flood episode. The shell originally inhabited a bay or estuarine environment (Morris 1966:27; McLean 1978:78) and could have been collected in the tidal flats near the mouth of the Santa Ana River or in Newport Bay. Both of these bay areas are less than 8 miles from the location where this shell was found. The area in the vicinity of the find was intensively surveyed for additional material but nothing was found.

Areas in the APE contained large amounts of trash, including plastic, rubber, and metal car parts, styrofoam pieces, paper, and plastic rubbish, as well as other items tossed out of vehicles. The entire APE is disturbed in some manner, either covered with asphalt, concrete, or structures. Buried utilities under the roadway have also added to the disturbance. The existing bridge over the Santa Ana River contains bridge footings that disturbed a large area on both the north and south sides of the river. Trails run the north and south sides of the river, and the south side, especially, is highly disturbed from trail construction. In all, the APE exhibits a high degree of disturbance and it is unlikely to contain any intact archaeological material or deposits.

STUDY FINDINGS AND CONCLUSIONS

A single fragment of *Chione californiensis* was found in the APE in an undeveloped area on the west side of Fairview Street just south of the Santa Ana River. No other cultural resources were found in the vicinity, thus the resource is an isolated find. Isolated finds are not considered important/significant under Section 106 of the National Historic Preservation Act or under the California Environmental Quality Act. Furthermore, Attachment 4 of the Caltrans PA (2014), identifies isolated prehistoric finds consisting of fewer than three items per 100 square meters (1,076 square feet) as exempt from evaluation. As such, the isolated shell fragment found in the current APE is not an important resource and requires no further evaluation.

No additional archaeological resources were identified within the APE through archival research, Native American consultation, or the field survey. The majority of the APE consists of paved asphalt and concrete sidewalk along Fairview Street from Westminster Avenue/17th Street south to Civic Center Drive. A small amount of acreage also includes areas outside of the sidewalk including adjacent streets, and the building, lawn, and parking lot at 1002 North Fairview Street.

The survey showed that all surveyable areas in the APE exhibited high levels of disturbance from road and bridge construction and adjacent home construction. Buried utilities have also added to the disturbance of the APE. The entire APE has been substantially altered during previous construction activities. As such, the likelihood of encountering intact archaeological resources is very low.

UNIDENTIFIED CULTURAL RESOURCES

If previously unidentified cultural materials are unearthed during construction, it is Caltrans' policy that work be halted in that portion of the project area until a qualified archaeologist can assess the significance of the find. Additional archaeological surveys will be needed if the project limits are extended beyond the present survey limits.

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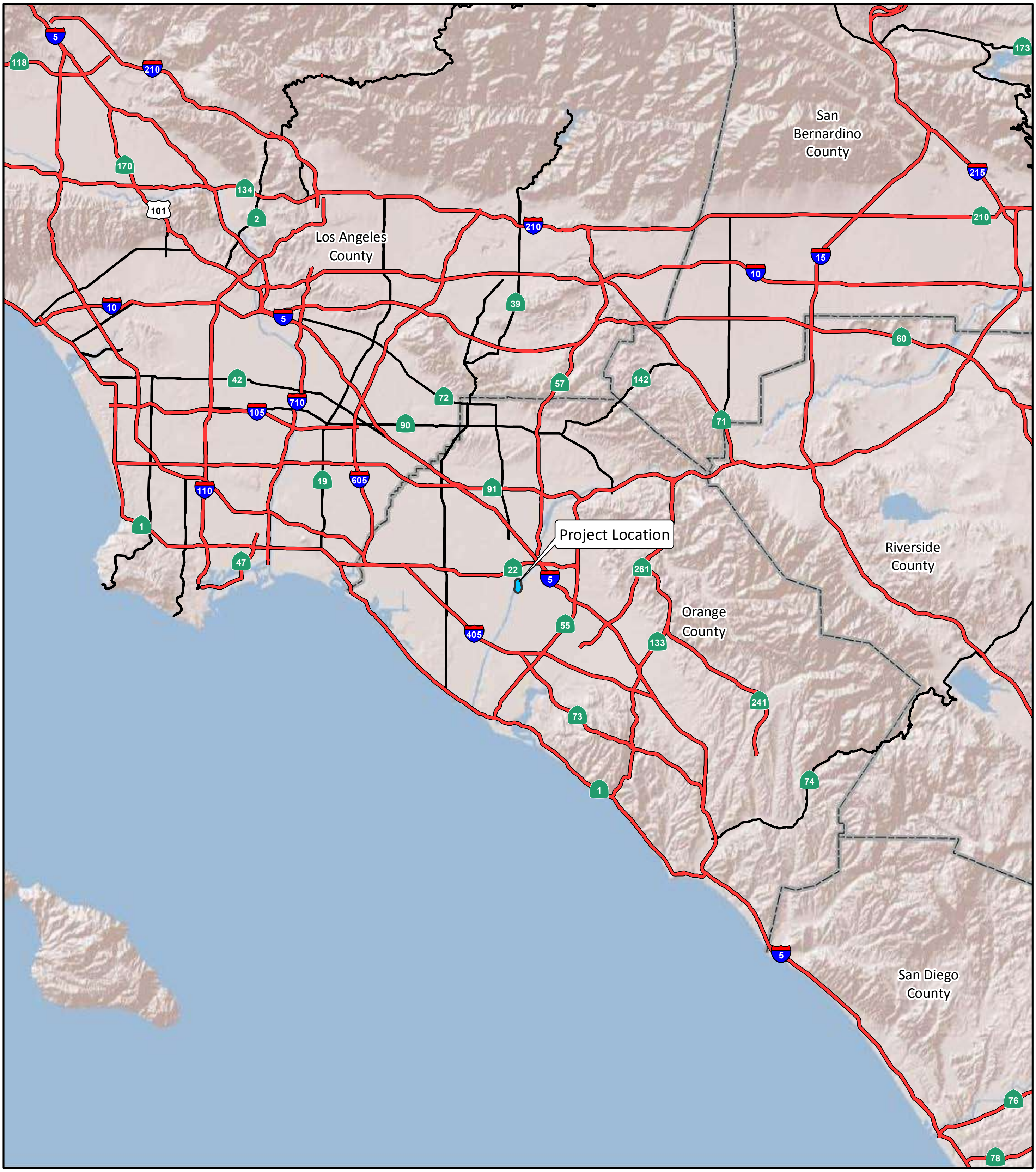
APPENDIX A

FIGURES



LEGEND

Project Area

FIGURE 1

0 25000 50000
FEET

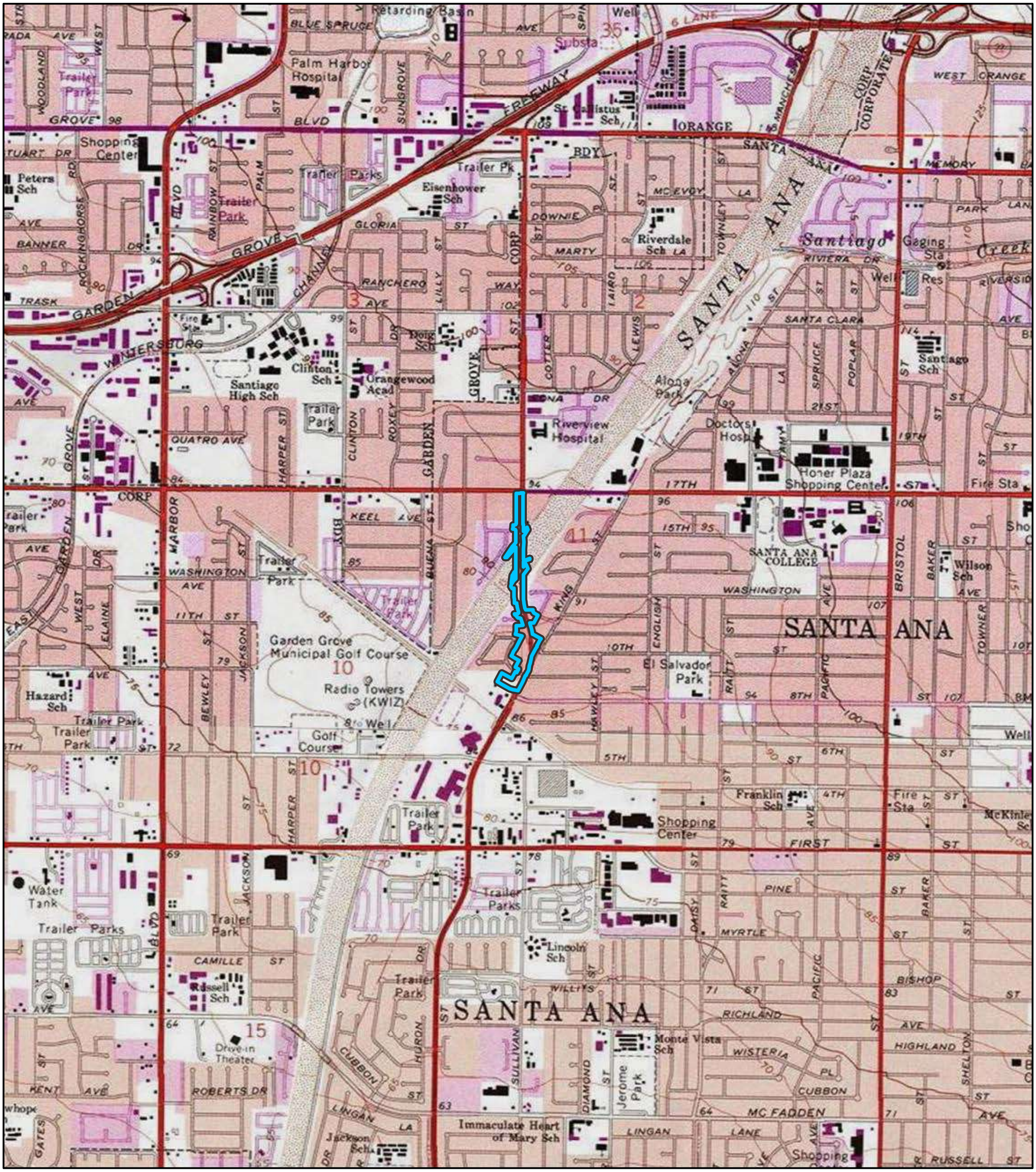
SOURCE: Esri (2017)

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Project Location

Federal Project No.: BRLS 5063(184)

I:\WKE1702\GIS\HPSR_ProjLoc.mxd (5/21/2019)



LEGEND

Project Location

FIGURE 2

N

0 1000 2000

FEET

SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Project Location

Federal Project No.: BRLS 5063(184)

I:\WKE1702\GIS\HPSR_ProjLocUSGS.mxd (5/21/2019)

LEGEND

Area of Potential Effects (11.93 ac)

Survey Coverage Area (3.92 ac)

Proposed Improvements

0 100 200
FEET

SOURCE: Bing (2015); WKE (2017)

I:\WKE1702\GIS\SurveyCoverage.mxd (5/22/2019)

FIGURE 3

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Survey Coverage Map

Federal Project No.: BRLS 5063(184

APPENDIX B

RESULTS OF RECORD SEARCH

South Central Coastal Information Center
California State University, Fullerton
Department of Anthropology MH-426
800 North State College Boulevard
Fullerton, CA 92834-6846
657.278.5395 / FAX 657.278.5542
sccic@fullerton.edu
California Historical Resources Information System
Orange, Los Angeles, and Ventura Counties

3/5/2018 Records Search File No.: 18641.4703

Joshua R. Toney
LSA
20 Executive Park, Suite 200
Irvine, CA 92614

Re: Records Search Results for the WKE1702 (Fairview Street Widening and Bridge Replacement)

The South Central Coastal Information Center received your records search request for the project area referenced above, located on the Anaheim, CA USGS 7.5' quadrangle. The following reflects the results of the records search for the project area and a 1-mile radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☐ custom GIS maps ☒ shape files ☐ hand-drawn maps

Resources within project area: 0	None
Resources within 1-mile radius: 44	See attached list
Resources listed in the OHP Historic Properties Directory within project area: 0	None
Resources listed in the OHP Historic Properties Directory within 1-mile radius: 26	SEE ATTACHED LIST FOR INDIVIDUAL PROPERTY STATUS CODES – resource locations from the OHP HPD may or may not be plotted on the custom GIS map or provided as a shape file
Resources listed in the Historic Properties Directory that lack specific locational information: 3	SEE ATTACHED LIST FOR INDIVIDUAL PROPERTY STATUS CODES - These properties may or may not be in your project area or in the search radius.
Reports within project area: 8	OR-00270, OR-00801, OR-01639, OR-01836, OR-02914, OR-04087, OR-04259, OR-04266
Reports within 1-mile radius: 30	See attached list

<u>Resource Database Printout (list):</u> ☐ enclosed ☒ not requested ☐ nothing listed
<u>Resource Database Printout (details):</u> ☐ enclosed ☒ not requested ☐ nothing listed
<u>Resource Digital Database (spreadsheet):</u> ☒ enclosed ☐ not requested ☐ nothing listed
<u>Report Database Printout (list):</u> ☐ enclosed ☒ not requested ☐ nothing listed
<u>Report Database Printout (details):</u> ☐ enclosed ☒ not requested ☐ nothing listed

Report Digital Database (spreadsheet): ☒ enclosed ☐ not requested ☐ nothing listed
Resource Record Copies: ☒ enclosed ☐ not requested ☐ nothing listed
Report Copies: ☐ enclosed ☒ not requested ☐ nothing listed
OHP Historic Properties Directory: ☒ enclosed ☐ not requested ☐ nothing listed
Archaeological Determinations of Eligibility: ☐ enclosed ☐ not requested ☒ nothing listed
Historical Maps: ☒ enclosed ☐ not requested ☐ nothing listed
Ethnographic Information: ☒ not available at SCCIC
Historical Literature: ☒ not available at SCCIC
GLO and/or Rancho Plat Maps: ☒ not available at SCCIC
Caltrans Bridge Survey: ☒ not available at SCCIC; please go to
http://www.dot.ca.gov/hq/structur/strmaint/historic.htm
Shipwreck Inventory: ☒ not available at SCCIC; please go to
http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp
Soil Survey Maps: (see below) ☒ not available at SCCIC; please go to
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System,

Digitally signed by Michelle Galaz
Date: 2018.03.05 17:19:12 -08'00'

Michelle Galaz
Assistant Coordinators

Enclosures:

(X) GIS Shapefiles – 82 shapes

(X) Resource Digital Database (spreadsheet) – 44 lines

(X) Report Digital Database (spreadsheet) – 38 lines

(X) Resource Record Copies – (all) – 173 pages

(X) OHP Historic Properties Directory – 13 pages

(X) National Register Status Codes – 1 page

(X) Historical Maps – 8 pages

ReportNum	DocAddlCitLetter	IsVoided	IsMissing	IDs	Authors	CitYear	CitMonth	CitTitle	CitPublisher
OR-00270		No	No		Leonard, Nelson N. III and Mathew C. Hall	1975		Description and Evaluation of Cultural Resources Within the US Army Corps of Engineers' Santa Ana River Project	Archaeological Research Unit, UC Riverside
OR-00778		No	No		Drover, Christopher E.	1976		Archaeological Reconnaissance of the Santiago Creek Specific Plan Property	Golden West College
OR-00801		No	No		Langenwalter, Paul E. and James Brock	1985		Phase Ii Archaeological Studies Prado Basin and the Lower Santa Ana River	
OR-00846		No	No		Bissell, Ronald M.	1986		Historic Properties Survey Report, Bristol Street Between First Street and Memory Lane, City of Santa Ana, Orange County	
OR-01639		No	No		Jertberg, Patricia R. and Rosenthal, Jane	1997		Prehistoric and Historic Resource Assessment for the Fairview Street Improvement Initial Study/environmental Assessment Located in Garden Grove, Santa Ana, an Unincorporated Orange County	Petra Resources, Inc.
OR-01836		No	No		Padon, Beth	1998		Cultural Resource Review for Groundwater Replenishment System Program EIR/Tier I/EIS, Orange County Water District and County Sanitation Districts of Orange County	Discovery Works, Inc.
OR-01900		No	No		Hatheway, Roger G.	1987		Historical and Architectural Evaluation of Four Railroad Bridges, Lower Santa Ana River and Santiago Creek Orange County, California	Roger Hatheway
OR-01949		No	Yes		Padon, Beth, McLean, Deborah, and Strudwick, Ivan	1995		Cultural Resource Assessment for the City of Garden Grove	LSA Associates, Inc.
OR-01954		No	No		Padon, Beth	1996		Archaeological Archival Review and Survey of the Co 5 and Co 6 Flood Control Channels, Anaheim, Newport, and Seal Beach USGS 7.5' Quadrangles, Orange County, California	Petra Resources, Inc.
OR-01971		No	No		Anonymous	1987		Historic Property Survey Report for the Proposed Widening of Bristol Street From Warner Avenue to Santiago Creek	Willdan Associates
OR-01978		No	No		Duke, Curt	1999		Cultural Resource Assessment for the At&t Wireless Services Facility Number C011, County of Orange, California	LSA Associates, Inc.
OR-02010		No	No		Perry, Richard M.	1993		Memorandum for Record, Subject: Cultural Resources Survey of the 7.78 Acre Staging Area for Reaches 3 and 4 of the Santa Ana River Project in the City of Santa Ana	Army Corps of Engineers
OR-02453		No	No		Dice, Michael H.	2002		An Archaeological Resource Assessment of the Fairview Street Resurfacing Project, (17th Street to North City Limit) City of Santa Ana, California	Michael Brandman Associates
OR-02750		No	No		Keas, Nicole	2001		Proposed Red River Cellular Site (nextel #7064b) Garden Grove, Ca	Orin Environmental Group
OR-02823		No	No		Dice, Michael H.	2003		Records Search Results and Site Visit for Cingular Telecommunications Facility Candidate Sc-102-02 (fairview), 1517 North Fairview, Santa Ana, Orange County, California	Michael Brandman Associates
OR-02914		No	No		Bonner, Wayne H.	2002		Records Search Results for Cingular Wireless Site Sc-102-02 (fairview), 1517 N. Fairview St., Santa Ana, Orange County, California	W. H. Bonner Associates
OR-03074		No	No	Cellular -	Bonner, Wayne H.	2006		Cultural Resources Records Search Results and Site Visit for T-mobile Candidate La02909e (mel-o-dee Ice Cream), 2649 West 1st Street, Santa Ana, Orange County, California	Michael Brandman Associates
OR-03075		No	No	Cellular -	Bonner, Wayne H.	2005		Cultural Resources Records Search Results and Site Visit for T-mobile Candidate La03010a (jerome Park), 726 South Center Street, Santa Ana, Orange County, California	Michael Brandman Associates
OR-03281		No	No		Blodgett, John	1990		Proposed Widening of Bristol Street, From Warner Avenue to Memory Lane, in the City of Santa Ana, Final Environmental Impact Statement	Willdan Assoc.
OR-03297		No	No		Hupp, Jill	2002		Supplemental Historic Architectural Survey Report for the State Route 22/west Orange County Connection in Orange County	California Department of Transportation
OR-03371		No	No		Ritchie, Michael	2000		Determination of Effect State Route 22/west Orange County Connnection	Caltrans District 12
OR-03401		No	No	Cellular -	Supernowicz, Dana E.	2007		Cultural Resources Study of the W. 1st Street & S. Fairview Project Royal Street Communications, Llc Site No. La2831a 2715 W. 1st Street, Santa Ana, Orange County, California 92703	Historic Resource Associates
OR-03426		No	No		Bonner, Wayne H.	2006		Cultural Resource Records Search and Site Visit Results for Royal Street Communications, Llc Candidate La0638a (fairview Monopine), 1517 North Fairview Street, Santa Ana, Orange County, California	Michael Brandman Associates
OR-03621		No	No		Dice, Michael H.	2002		An Archaeological Resources Assessment of the Fairview Street Resurfacng Project, (Edinger Avenue to First Street), City of Santa Ana, California	Michael Brandman Associates

ReportNum	DocAddlCitLetter	IsVoided	IsMissing	IDs	Authors	CitYear	CitMonth	CitTitle	CitPublisher
OR-03776		No	No		Padon, Beth	2000		Historic Property Survey Report for Harbor Boulevard Smart Street Improvements, City of Garden Grove, Orange County, California.	Discovery Works, Inc.
OR-03783		No	No		Bonner, Wayne	2009		Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA03009C (El Salvador Park), 1825 Civic Center Drive West, Santa Ana, Orange County, California	MBA
OR-03789		No	No	Cellular -	Bonner, Wayne	2009		Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA33826B (City Yard), 2001 West Chestnut Avenue, Santa Ana, Orange County, California	MBA
OR-03890		No	No		Slauson, Dana	2000		Historic Property Survey Report and Historic Property Survey Report - Reduced Build Alternative Addendum	Greenwood and Associates; Parsons Brinckerhoff Quade & Douglas, Inc.
OR-04075		No	No		Johnson, Brent	2010		Cultural Resources Records Search and Site Visit for T-Mobile USA Inc. LA33807B / Riverview Park, 1817 West 21st Street, Santa Ana, Orange County, California 92706	Heritage Preservation Consultants
OR-04087		No	No		Salenius, Sylvia	1998		Program EIR/Tier 1 EIS, Groundwater Replenishment System	Orange County Water District & Orange County Sanitation District
OR-04124		No	No		Farrar, Corice	2010		Section 404 Authorization for the First Street Bridge Replacement Project, City of Santa Ana, Orange County, California	Corps of Engineers
OR-04195		No	No		Rogers, Leslie	2011		Section 106 Consultation for the Santa Ana and Garden Grove Fixed Guideway Corridor Project, Orange County, CA	Federal Transit Authority
OR-04259		No	No		Becker, Kenneth, Goodman, John, Sewell, Kristin, and Van Galder, Sarah	2007		Cultural Resources Monitoring Report, Orange County Water District Groundwater Replenishment System, Orange County, California	SRI
OR-04266		No	No		Bissell, Ronald M.	2000		Cultural Resources Reconnaissance for the Groundwater Replenishment System, Orange County, California	RMW Paleo Associates
OR-04280		No	No		Hollins, Jeremy and Nixon, Rachel	2012		Historic Property Survey Rreport, proposed to widen Bristol Street between Warner Avenue and Memory Lane	URS Corp
OR-04310		No	No		Haas, Hannah, Hunt, Kevin, and Ramirez, Robert	2013		Cultural Resources Study for the 803-815 N Harbor Boulevard Residential Project Santa Ana, Orange County, California	City of Santa Ana
OR-04390		No	No		Strudwick, Ivan	2010	7	Archaeological Survey Report for the First Street Bridge Replacement Project Cities of Santa Ana County of Orange, California	LSA Associates
OR-04471		No	No		Bonner, Diane, Wills, Carrie, and Crawford, Kathleen	2014	1	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA02095A (CM095 SAC Dunlap Hall) 1530 West 17th Street, Santa Ana, Orange County, California	EAS
OR-04471	A	No	No		Bonner, Wayne H.	2014		Direct APE Historic Architectural Assessment for T-Mobile West, LLC Candidate LA02095A (CM095 SAC Dunlap Hall) 1530 West 17th Street, Santa Ana, Orange County, California	EAS

ReportNum	CitPages	ReportType	InventorySize	InventoryDisclosure	InventoryCollections	InventoryNotes	Resources	ResourceCount	HasInformals
OR-00270	108	Archaeological, Field study	QC				30-000277	1	No
OR-00778	11	Archaeological, Field study	QC	Not for publication	No		30-000369	1	No
OR-00801	449	Archaeological, Field study	QC				30-000089, 30-000817	2	No
OR-00846	21	Archaeological, Field study	QC				30-176650, 30-176651, 30-176652, 30-176653, 30-176992, 30-176993, 30-176994, 30-176995, 30-176996, 30-176997, 30-176998, 30-176999, 30-177000, 30-177001, 30-177002, 30-177003, 30-177004, 30-177005, 30-177006, 30-177007, 30-177008, 30-177009, 30-177010	23	No
OR-01639		Archaeological, Field study					30-000278, 30-000392	2	No
OR-01836	30	Literature search	QC					0	No
OR-01900	55	Evaluation	QC				30-161847	1	No
OR-01949	23	Literature search	QC				30-000392, 30-001260, 30-001261, 30-001262, 30-001263, 30-001264, 30-001265, 30-001266, 30-001267, 30-001268, 30-001269, 30-001270, 30-001307	13	No
OR-01954	19	Archaeological, Field study	QC					0	No
OR-01971	81	Other research	QC				30-161830	1	No
OR-01978	4	Archaeological, Field study	< 1 ac					0	No
OR-02010		Archaeological, Field study	7.78 ac					0	No
OR-02453		Literature search	12 ac					0	No
OR-02750		Archaeological, Architectural/historical, Field study	.25 ac			There are remaining artifacts at site	30-000392	1	No
OR-02823		Archaeological, Field study	.25 ac					0	No
OR-02914		Literature search	<0.25 ac					0	No
OR-03074	11	Archaeological, Field study	QC					0	No
OR-03075	12	Archaeological, Field study	QC					0	No
OR-03281	28	Management/planning	QC					0	No
OR-03297		Archaeological, Architectural/historical, Evaluation, Field study, Other research	12.5 li mi					0	No
OR-03371	11	Other research	QC				19-000392, 19-001352	2	No
OR-03401	19	Archaeological, Architectural/historical, Evaluation, Field study	QC	Not for publication	No		30-161847, 30-179851	2	No
OR-03426		Archaeological, Field study	<1 ac					0	No
OR-03621	30	Archaeological, Field study	QC					0	No

ReportNum	CitPages	ReportType	InventorySize	InventoryDisclosure	InventoryCollections	InventoryNotes	Resources	ResourceCount	HasInformals
OR-03776	67	Archaeological, Field study	QC	Not for publication	No		30-157376, 30-176876, 30-176877, 30-176878, 30-176879, 30-176880, 30-176881, 30-176882, 30-176883, 30-176884, 30-176885, 30-176886, 30-176887, 30-176888, 30-176889, 30-176890, 30-176891, 30-176892, 30-176893, 30-176894, 30-176895, 30-176896, 30-176897, 30-176898, 30-176899, 30-176900, 30-176901, 30-176902, 30-176903, 30-176904, 30-176905, 30-176906, 30-176907, 30-176908, 30-176909, 30-176910, 30-176911, 30-176912, 30-176913, 30-176914, 30-176915, 30-176916, 30-176917, 30-176918, 30-176919, 30-176920, 30-176921, 30-176922, 30-176923, 30-176924, 30-176925, 30-176926, 30-176927, 30-176928, 30-176929, 30-176930, 30-176931, 30-176932, 30-176933, 30-176934, 30-176935, 30-176936, 30-176937, 30-176938, 30-176939, 30-176940, 30-176941, 30-176942, 30-176943	69	No
OR-03783	11	Archaeological, Field study, Other research		Not for publication	No			0	No
OR-03789	6	Archaeological, Field study, Other research	QC	Not for publication	No			0	No
OR-03890	132	Archaeological, Architectural/historical, Evaluation, Field study, Management/planning, Other research	QC	Not for publication	No		30-157430, 30-161847, 30-177022, 30-177023, 30-177024, 30-177025, 30-177026, 30-177027, 30-177028, 30-177029, 30-177030, 30-177031, 30-177032, 30-177033, 30-177034	15	No
OR-04075	60	Archaeological, Field study		Not for publication	No			0	No
OR-04087	672	Management/planning	QC					0	No
OR-04124	18	Other research	QC	Not for publication	No			0	No
OR-04195	19	Archaeological, Field study, Other research	QC				30-001030, 30-001031, 30-001374, 30-001375, 30-001377, 30-001378, 30-001379, 30-001589, 30-160798, 30-160801, 30-160803, 30-160819, 30-160824, 30-160830, 30-160891, 30-161037, 30-161847, 30-176651, 30-176653, 30-176657, 30-176658, 30-176659, 30-176809, 30-176912, 30-176913, 30-176914, 30-176915, 30-176916, 30-176917, 30-176918, 30-176992, 30-176993, 30-176994, 30-176995, 30-177027, 30-177028, 30-177029, 30-177030, 30-177031, 30-177032, 30-177033, 30-177034, 30-179882	43	No
OR-04259	113	Monitoring	QC				30-001670, 30-001671, 30-100402	3	No
OR-04266	50	Archaeological, Field study	QC	Not for publication	No		30-000058, 30-000076, 30-000145, 30-000163, 30-000283, 30-000302, 30-000356, 30-000428, 30-000429, 30-000430, 30-000506, 30-000516, 30-000517, 30-001524	14	No
OR-04280	129	Archaeological, Architectural/historical, Evaluation, Field study					30-160749, 30-160754, 30-160757, 30-160761, 30-160763, 30-160764, 30-160765, 30-160772, 30-176996, 30-176997, 30-176999, 30-177001, 30-177006, 30-177007, 30-177474, 30-177475, 30-177476, 30-177477, 30-177478, 30-177479, 30-177480, 30-177481, 30-177482, 30-177483, 30-177484, 30-177485, 30-177486, 30-177487, 30-177488, 30-177489, 30-177490, 30-177491, 30-177492, 30-177493, 30-177494, 30-177495	36	No
OR-04310	29	Archaeological, Field study					30-176916, 30-176920, 30-176921, 30-176922, 30-176923, 30-176924, 30-176925, 30-176926, 30-176927, 30-176928, 30-176929, 30-176930, 30-176931, 30-176932, 30-177500	15	No
OR-04390	27	Archaeological, Field study		Unrestricted				0	No
OR-04471	12	Archaeological, Architectural/Historical, Field study		Unrestricted	No		30-177539	1	No
OR-04471	2	Architectural/Historical, Evaluation		Unrestricted	No				

ReportNum	Counties	Maps	Addresses
OR-00270	Orange	ANAHEIM, BLACK STAR CANYON, EL TORO, NEWPORT BEACH, ORANGE, PRADO DAM	
OR-00778	Orange	ANAHEIM, ORANGE	
OR-00801	Orange	ANAHEIM, BLACK STAR CANYON, NEWPORT BEACH, ORANGE, PRADO DAM	
OR-00846	Orange	ANAHEIM, NEWPORT BEACH	
OR-01639	Orange	ANAHEIM	
OR-01836	Orange	ANAHEIM, NEWPORT BEACH, ORANGE	
OR-01900	Orange	ANAHEIM, ORANGE	
OR-01949	Orange	ANAHEIM, LOS ALAMITOS, NEWPORT BEACH	
OR-01954	Orange	ANAHEIM, NEWPORT BEACH, SEAL BEACH	
OR-01971	Orange	ANAHEIM, NEWPORT BEACH	
OR-01978	Orange	ANAHEIM	
OR-02010	Orange	ANAHEIM	
OR-02453	Orange	ANAHEIM	
OR-02750	Orange	ANAHEIM	
OR-02823	Orange	ANAHEIM	
OR-02914	Orange	ANAHEIM	
OR-03074	Orange	NEWPORT BEACH	
OR-03075	Orange	NEWPORT BEACH	
OR-03281	Orange	ANAHEIM, NEWPORT BEACH	
OR-03297	Orange	ANAHEIM	
OR-03371	Orange	ANAHEIM, LOS ALAMITOS, ORANGE	
OR-03401	Orange	NEWPORT BEACH	
OR-03426	Orange	ANAHEIM	
OR-03621	Orange	NEWPORT BEACH	

ReportNum	Counties	Maps	Addresses
OR-03776	Orange	ANAHEIM, NEWPORT BEACH	Harbor Blvd. Santa Ana
OR-03783	Orange	ANAHEIM	1825 Civic Center Drive West Santa Ana
OR-03789	Orange	NEWPORT BEACH	2001 West Chestnut Avenue Santa Ana
OR-03890	Orange	ANAHEIM, NEWPORT BEACH	
OR-04075	Orange	ANAHEIM	1817 West 21st Street Santa Ana
OR-04087	Orange	ANAHEIM, NEWPORT BEACH, ORANGE	
OR-04124	Orange	NEWPORT BEACH	First Street Santa Ana
OR-04195	Orange	ANAHEIM, NEWPORT BEACH, ORANGE, TUSTIN	
OR-04259	Orange	ANAHEIM, NEWPORT BEACH, ORANGE	
OR-04266	Orange	ANAHEIM, ORANGE	
OR-04280	Orange	ANAHEIM	
OR-04310	Orange	ANAHEIM	803 N Harbor Blvd Santa Ana, CA, 812 N Harbor Blvd
OR-04390	Orange	NEWPORT BEACH	
OR-04471	Orange	ANAHEIM	1530 W 17th St Santa Ana CA
OR-04471			

APPENDIX C

ISOLATE RECORD FORM FOR P-30-100233

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-30-100233
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code ______ Reviewer ____________________ Date

 *Resource Name or #: (Assigned by recorder) LSA-WKE1702-IS-I-1

P1. Other Identifier: Isolated *Chione* shell

***P2. Location:** ☒ **Not for Publication** ☐ **Unrestricted**

*a. **County** Orange

*b. **USGS 7.5' Quad** *Anaheim* **Date** 1981 **Township/Range T** 5S **R** 10W along E side of NE¼ of Sect 10.

c. **Address** 1056-1078 N. Fairview Street **City** Santa Ana **Zip** 92703

d. **UTM:** 416372 **mE/** 3735392 **mN**. (11N)

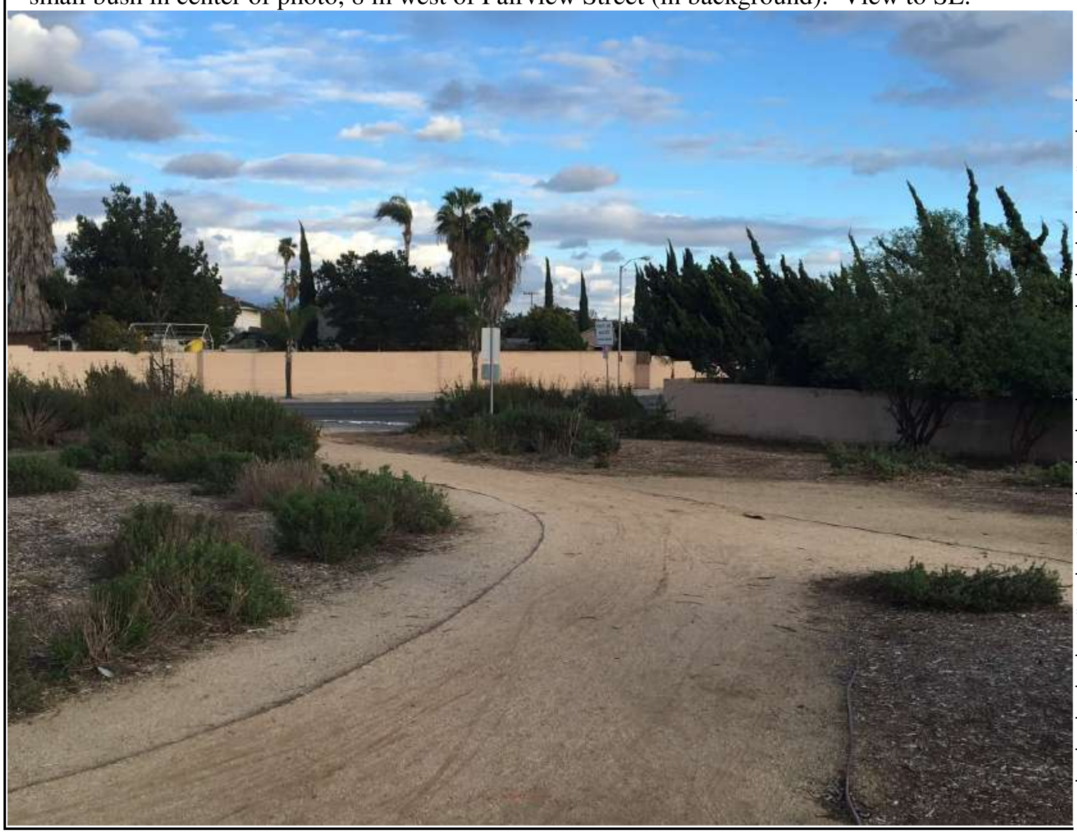
e. **Other Locational Data:** (e.g., parcel #, directions to resource, elevation, etc.) The isolated find is located approx. 60 m SE of the concrete-lined south bank of the Santa Ana River along the west side of Fairview Street. The shell …(See Continuation Sheet)

***P3a. Description:** This find is an isolated *Chione californiensis* (Calif. Venus clam) fragment found at the eastern edge of a triangular greenbelt area 60 m SE of the south bank of the Santa Ana River and approx. 8 m west … (See Continuation Sheet)

***P3b. Resource Attributes:** Isolated Marine Shell (AP16).

***P4. Resources Present:** ☐ Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☒ Isolated Find.

Isolated *Chione* Shell: This isolate was found near sign just right of trail and on other side of small bush in center of photo, 8 m west of Fairview Street (in background). View to SE.



***P6. Date Constructed/Age and Sources:**
☐ Historic
☒ Prehistoric

***P7. Owner and Address:**
City of Santa Ana
20 Civic Center Plaza
Santa Ana, CA
92701

***P8. Recorded by:**
Ivan H. Strudwick
LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, CA 92614

***P9. Date Recorded**
March 16, 2018

***P10. Survey Type:** (Describe)
Pedestrian Survey of
Fairview Street and Bridge

*** P11. Report Citation:** Strudwick. 2019. Archaeological Survey Report (ASR) for the Fairview Bridge Project, County of Orange, California. LSA Associates, Inc.

Attachments: ☐None ☒Location Map ☐Site Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-30-100233
HRI #
Trinomial

 *Resource Name or #: (Assigned by recorder) LSA-WKE1702-IS-I-1

*Recorded by Ivan H. Strudwick *Date March 16, 2018 ☒ Continuation ☐ Update

***P2e. Other Locational Data:**
… was found in an open greenbelt area approx. 8 m west of the pavement on Fairview Street. This location is 60 m SE of the south edge of the Santa Ana River and even closer to the Santa Ana River trail, a paved trail following the south bank of the river. The survey was conducted for the Fairview Bridge replacement project.

***P3a. Description:**
… of the pavement along the west side of Fairview Street at an elevation of 95 ft. The greenbelt area where the shell was found is a 1-1.5 acre triangularly-shaped area with benches, a water fountain, and trash bins that serves as a rest area for those using the adjacent river trail. Most of the greenbelt area contains pathways of recently introduced decomposing granitic (DG) material and recently planted endemic plant species. Although ground visibility is 30-100 percent in this area, the DG and vegetation obscures much of the native sediment, which is a sandy alluvium with gravel. The area was intensively surveyed after the shell was found but no other material was observed. It is difficult to know if the shell was left here prehistorically by an individual, or if it washed to this location from a prehistoric site upstream during a flood episode. Venus shell (*Chione* spp.) inhabit the substrate of sandy mudflats in bays and could have been obtained near the mouth of the Santa Ana River approx. 8 miles downstream, or in Upper Newport Bay, located just over 7.0 miles to the SSE.

Isolated fragment of *Chione californiensis* (California Venus clam):

State of California - The Resources Agency

DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

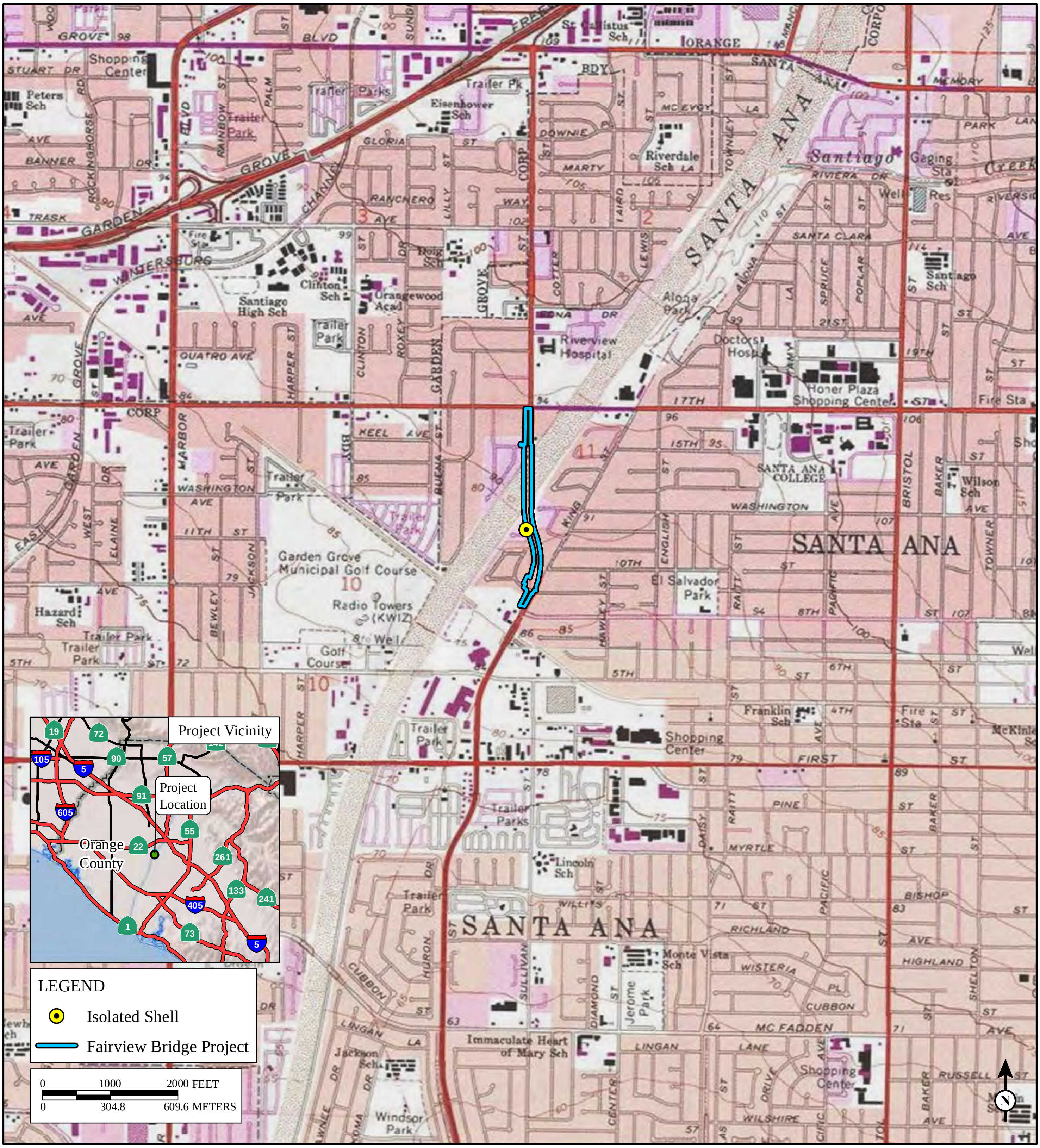
Primary # P-30-100233

HRI #

Trinomial

Page 3 of 3 ***Resource Name or** # (Assigned by recorder) LSA WKE1702-IS-I-1

*Map Name: *Anaheim CA 7.5' USGS (1981)* *Scale: 1:24000 *Date of Map: 1981



I:\WKE1702\GIS\DPR_Map.mxd (3/21/2018)

* Required Information

DPR 523J (1/95)

Attachment E

Native American Consultation Records

SECTION 106 NATIVE AMERICAN CONSULTATION RECORD
Fairview Street Widening and Bridge Replacement Project, Santa Ana, Orange County, California

Date the Sacred Lands File Search request was submitted to the Native American Heritage Commission (NAHC): February 9, 2018

Date the NAHC responded: February 12, 2018

Results of the NAHC Sacred Lands File Search: The Sacred Lands File search was completed with **negative** results for the presence of Native American cultural resources in the Area of Potential Effect (APE); however the NAHC recommended that the 23 Native American individuals listed in the table below be contacted for information regarding cultural resources that could be affected by the project.

Groups/Individuals Contacted	Date of Project Notification Letter	Date of Tribal Response to Letter	Date and Results of Follow-up Telephone Calls and/or Emails
Campo Band of Mission Indians Ralph Goff, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made. A representative of the Tribe answered the office phone, and took down LSA's contact information for Mr. Goff. No response was received.
Ewiiaapaayp Tribal Office Michael Garcia, Vice Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made to the Tribal office. A message was left for Mr. Garcia and Mr. Pinto since their listed phone number is the same. No response was received.
Ewiiaapaayp Tribal Office Robert Pinto, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made to the Tribal office. A message was left for Mr. Garcia and Mr. Pinto since their listed phone number is the same. No response was received.

Groups/Individuals Contacted	Date of Project Notification Letter	Date of Tribal Response to Letter	Date and Results of Follow-up Telephone Calls and/or Emails
Gabrieleno Band of Mission Indians – Kizh Nation Andrew Salas, Chairperson *Gabrieleno*	03/26/2018	03/29/2018: Mr. Salas sent a letter via email requesting consultation.	03/29/2018: An email response was sent to Mr. Salas requesting additional and more specific information. Mr. Salas responded with an invitation to meet at the Tribal office. A response was sent to Mr. Salas informing him that the location of the Tribal office was too far and instead offered a teleconference option. 03/30/2018: Mr. Salas sent another email to request contact from the lead agency and copied the NAHC on the message. This message and request was forwarded to Caltrans. 04/04/2018: Caltrans responded to Mr. Salas (and copied the NAHC) to reach out and request any information about knowledge of specific resources in the project area. Caltrans also reiterated that a teleconference is an option and offered to schedule a time for the teleconference if the group was interested. 04/12/2018: Caltrans sent another follow-up email to Mr. Salas to offer a teleconference option to discuss the project and address any questions or concerns that the group may have. As of 05/15/2018, no response was received.
Gabrieleno/Tongva San Gabriel Band of Mission Indians Anthony Morales, Chairperson *Gabrieleno*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Mr. Morales. No response was received.
Gabrielino/Tongva Nation Sandonne Goad, Chairperson *Gabrielino*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Ms. Goad. No response was received.

SECTION 106 NATIVE AMERICAN CONSULTATION RECORD
Fairview Street Widening and Bridge Replacement Project, Santa Ana, Orange County, California

Groups/Individuals Contacted	Date of Project Notification Letter	Date of Tribal Response to Letter	Date and Results of Follow-up Telephone Calls and/or Emails
Gabrielino Tongva Indians of California Tribal Council Robert Dorame, Chairperson *Gabrielino*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Mr. Dorame. No response was received.
Gabrielino-Tongva Tribe Charles Alvarez *Gabrielino*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Mr. Alvarez. No response was received.
Jamul Indian Village Erica Pinto, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made to Ms. Pinto. The call was automatically sent to the office for Jamul Indian Village, and the call was then transferred to the voicemail of Marci O'Husky; a message was left for Ms. O'Husky. No response was received.
Juaneño Band of Mission Indians Sonia Johnston, Chairperson *Juaneño*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Ms. Johnston. No response was received.
Juaneño Band of Mission Indians Acjachemen Nation – Belardes Joyce Perry, Tribal Manager *Juaneño*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Ms. Perry. No response was received.
Juaneño Band of Mission Indians Acjachemen Nation – Belardes Matias Belardes, Chairperson *Juaneño*	03/26/2018	No response received.	1/25/2018: The contact information provided on the NAHC was for Joyce Perry, with the same group. An email was sent to Ms. Perry. No response was received.
Juaneño Band of Mission Indians Acjachemen Nation – Romero Teresa Romero, Chairperson *Juaneño*	03/26/2018	No response received.	04/10/2018: A follow-up email was sent to Ms. Romero. No response was received.

SECTION 106 NATIVE AMERICAN CONSULTATION RECORD
Fairview Street Widening and Bridge Replacement Project, Santa Ana, Orange County, California

Groups/Individuals Contacted	Date of Project Notification Letter	Date of Tribal Response to Letter	Date and Results of Follow-up Telephone Calls and/or Emails
La Posta Band of Mission Indians Gwendolyn Parada, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made to the Tribe. The call was answered by the main office assistant, who informed me that the consultation invitation was likely received but not responded to since the project is outside the Tribe's area. A voicemail was left for the Chairperson Parada to follow-up. No response was received.
La Posta Band of Mission Indians Javaughn Miller, Tribal Administrator Kumeyaay	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made to the Tribe. The call was answered by the main office assistant, who informed me that the consultation invitation was likely received but not responded to since the project is outside the Tribe's area. A voicemail was left for the Chairperson Parada to follow-up. No response was received.
Manzanita Band of Kumeyaay Nation Angela Elliott Santos, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was made to Ms. Santos, but it went to the Tribal office's voicemail. A message was left for Ms. Santos. No response was received.
San Fernando Band of Mission Indians John Valenzuela, Chairperson *Kitanemuk Serrano Tataviam*	03/26/2018	No response received.	04/05/2018: A follow-up phone call to Mr. Valenzuela was attempted, but the phone number is either disconnected or no longer in service. A follow-up email was sent to Mr. Valenzuela. No response was received.

SECTION 106 NATIVE AMERICAN CONSULTATION RECORD
Fairview Street Widening and Bridge Replacement Project, Santa Ana, Orange County, California

Groups/Individuals Contacted	Date of Project Notification Letter	Date of Tribal Response to Letter	Date and Results of Follow-up Telephone Calls and/or Emails
San Pasqual Band of Mission Indians John Flores, Environmental Coordinator *Kumeyaay*	03/26/2018	No response received.	04/05/2018: Called the Tribal office and spoke with Doris. She said the Section 106 letters came in, but neither John nor Allen is available, and they will get back to me when they can. No response was received.
San Pasqual Band of Mission Indians Allen E. Lawson, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: Called the Tribal office and spoke with Doris. She said the Section 106 letters came in, but neither John nor Allen is available, and they will get back to me when they can. No response was received.
Sycuan Band of the Kumeyaay Nation Cody J. Martinez, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: Left a message for Mr. Martinez on the general voice mailbox of the Tribal government office. No response was received.
Sycuan Band of the Kumeyaay Nation Lisa Haws, Cultural Resources Manager *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up voice message was left for Mr. Martinez. No response was received.
Viejas Band of Kumeyaay Indians Robert Welch, Chairperson *Kumeyaay*	03/26/2018	No response received.	04/05/2018: A follow-up phone call was transferred to Katie Dunn, who works in the office of Mr. Welch. Ms. Dunn did not answer; a voicemail was left. 04/11/2018: A response letter dated April 2, 2018, was received from Ray Teran, Resource Management for the Viejas Band of Kumeyaay Indians. This letter stated that the project has little cultural significance or ties to Viejas, and requested that they be informed of any inadvertent discoveries.
Viejas Band of Kumeyaay Indians Julie Hagen *Kumeyaay*	03/26/2018	No response received.	04/05/2018: The administrative assistant who answered the phone stated that Ms. Hagen is no longer with the Tribe.

LSA

BERKELEY
CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

February 9, 2018

Native American Heritage Commission
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691

Subject: Sacred Lands File Search and Section 106 Consultation Native American Contacts List Request for the Fairview Street Widening and Bridge Replacement Project in Santa Ana, Orange County, California

To Whom It May Concern:

LSA has contracted with WKE, Inc to provide a Historic Property Survey Report in support of compliance with Section 106 of the National Historic Preservation Act, for a Caltrans local assistance project to widen Fairview Street and replace a bridge in Santa Ana, Orange County, California. I am requesting on behalf of our client that a review of the Sacred Lands Inventory be conducted for the project area.

Attached please find a 1:24,000 topographic map showing the location of the project area. Specifically, the project is depicted on the *Anaheim, California* United States Geological Survey topographic quadrangle map in Township 05 South, Range 10 West, in Section 11.

If there are sensitive Native American resources on or near the proposed project location that could be impacted by construction activities, please advise us accordingly. Also, please include a consultation list of Native American tribal representatives affiliated with the region so that we may notify them of the proposed project.

If you have any questions or concerns regarding the proposed project, please feel free to contact me directly at (949) 553-0666 or at Joshua.toney@lsa.net.

Sincerely,

LSA Associates, Inc.

Joshua R. Toney

Joshua R. Toney, PhD, RPA
Principle Investigator/Senior Archaeologist

Attachments: Sacred Lands File & Native American Contacts List Request Form
Project Location Map

20 Executive Park, Suite 200, Irvine, California 92614 949.553.0666 www.lsa.net

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Fairview Bridge Widening

County: Orange

USGS Quadrangle Name: Anaheim (1981)

Township: 05S **Range:** 10W **Section(s):** 11

Company/Firm/Agency: LSA Associates, Inc.

Street Address: 20 Executive Park, Suite 200

City: Irvine **Zip:** 92614

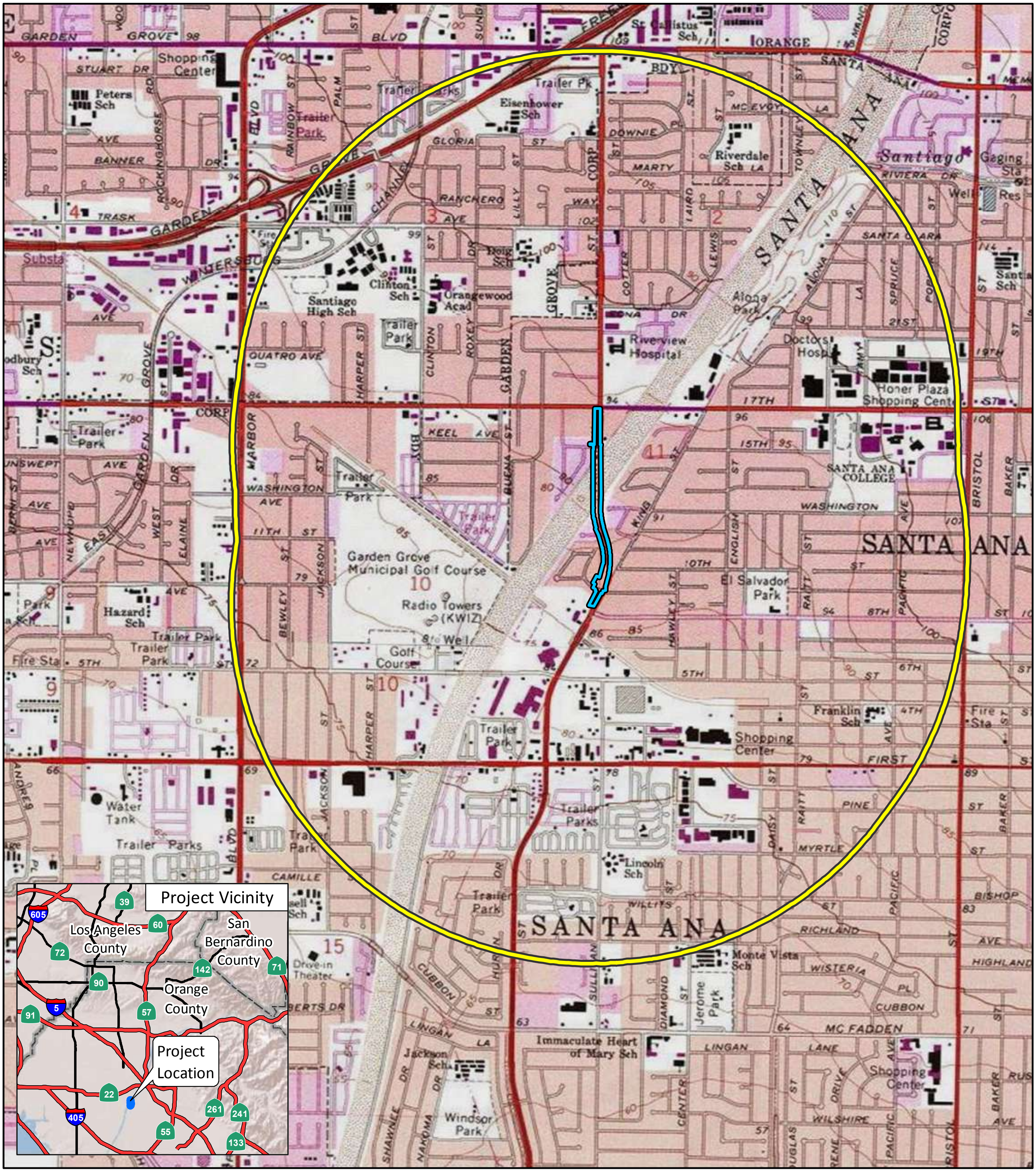
Phone: 949-553-0666

Fax:

Email: Joshua.Toney@lsa.net

Project Description:

The Proposed Project includes replacing the Fairview Street bridge over the Santa Ana River, widening Fairview Street between 9th Street and 16th Street, and restriping the north and south ends to match the existing condition in the City of Santa Ana (refer to Figures 1 and 2). The existing four-lane bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. The existing four-lane bridge is the only constraint in the Project Area for Fairview Street to be built out to its master-planned width of six lanes. Fairview Street is designated as a six-lane Major Arterial, as shown in the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element. The proposed bridge would have the same roadway profile as the existing bridge.



LEGEND

Project Area

Records Search Area

FIGURE 1

0 1000 2000
FEET

Fairview Street Widening and Bridge Replacement

Records Search Area

SOURCE: USGS (2017)

I:\WKE1702\GIS\ProjectLocation.mxd (2/6/2018)

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

February 12, 2018

Joshua Toney
LSA Associates, Inc.

Sent by E-mail: Joshua.toney@lsa.net

RE: Proposed Fairview Bridge Widening Project, City of Santa Ana; Anaheim USGS Quadrangle, Orange County, California

Dear Mr. Toney:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

Attached is a list of tribes culturally affiliated to the project area. I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst
(916) 373-3714

Native American Heritage Commission
Native American Contact List
Orange County
2/12/2018

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Kumeyaay
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribal Office
Michael Garcia, Vice Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Ewiiaapaayp Tribal Office
Robert Pinto, Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Kumeyaay
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817

Juaneno Band of Mission Indians
Sonia Johnston, Chairperson
P.O. Box 25628 — Juaneno
Santa Ana, CA, 92799
sonia.johnston@sbcglobal.net

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia — Juaneno
Irvine, CA, 92603
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Fairview Bridge Widening Project, Orange County.

Native American Heritage Commission
Native American Contact List
Orange County
2/12/2018

Juaneno Band of Mission Indians Acjachemen Nation - Romero Teresa Romero, Chairperson 31411-A La Matanza Street San Juan Capistrano, CA, 92675 Phone: (949) 488 - 3484 Fax: (949) 488-3294 tromero@juaneno.com	Juaneno
La Posta Band of Mission Indians Gwendolyn Parada, Chairperson 8 Crestwood Road Boulevard, CA, 91905 Phone: (619) 478 - 2113 Fax: (619) 478-2125 LP13boots@aol.com	Kumeyaay
La Posta Band of Mission Indians Javaughn Miller, Tribal Administrator 8 Crestwood Road Boulevard, CA, 91905 Phone: (619) 478 - 2113 Fax: (619) 478-2125 jmiller@LPtribe.net	Kumeyaay
Manzanita Band of Kumeyaay Nation Angela Elliott Santos, Chairperson P.O. Box 1302 Boulevard, CA, 91905 Phone: (619) 766 - 4930 Fax: (619) 766-4957	Kumeyaay
San Fernando Band of Mission Indians John Valenzuela, Chairperson P.O. Box 221838 Newhall, CA, 91322 Phone: (760) 885 - 0955 tsen2u@hotmail.com	Kitanemuk Serrano Tataviam
San Pasqual Band of Mission Indians John Flores, Environmental Coordinator P. O. Box 365 Valley Center, CA, 92082 Phone: (760) 749 - 3200 Fax: (760) 749-3876 johnf@sanpasqualtribe.org	Kumeyaay
San Pasqual Band of Mission Indians Allen E. Lawson, Chairperson P.O. Box 365 Valley Center, CA, 92082 Phone: (760) 749 - 3200 Fax: (760) 749-3876 allenl@sanpasqualtribe.org	Kumeyaay
Sycuan Band of the Kumeyaay Nation Cody J. Martinez, Chairperson 1 Kwaaypaay Court El Cajon, CA, 92019 Phone: (619) 445 - 2613 Fax: (619) 445-1927 ssilva@sycuan-nsn.gov	Kumeyaay
Sycuan Band of the Kumeyaay Nation Lisa Haws, Cultural Resources Manager 1 Kwaaypaay Court El Cajon, CA, 92019 Phone: (619) 312 - 1935 lhaws@sycuan-nsn.gov	Kumeyaay
Viejas Band of Kumeyaay Indians Robert Welch, Chairperson 1 Viejas Grade Road Alpine, CA, 91901 Phone: (619) 445 - 3810 Fax: (619) 445-5337 jhagen@viejas-nsn.gov	Kumeyaay

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Fairview Bridge Widening Project, Orange County.

Viejas Band of Kumeyaay Indians
Julie Hagen,
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

Kumeyaay

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Fairview Bridge Widening Project, Orange County.

SAMPLE CONSULTATION LETTER

LSA

BERKELEY
CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

March 26, 2018

Allen E. Lawson, Chairperson
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, CA 92082

Subject: Section 106 Consultation for the Fairview Street Widening and Bridge Replacement Project, Santa Ana, Orange County, California

Dear Chairperson Lawson:

The City of Santa Ana (City), in cooperation with the California Department of Transportation (Caltrans) District 12, proposes to replace the Fairview Street Bridge over the Santa Ana River, widen Fairview Street between 9th Street and 16th Street, and restripe the north and south ends to match the existing condition in Santa Ana.

The existing four-lane bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. The existing four-lane bridge is the only constraint in the Project Area for Fairview Street to be built out to its master-planned width of six lanes. Fairview Street is designated as a six-lane Major Arterial, as shown in the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element. The proposed bridge would have the same roadway profile as the existing bridge.

During construction, the Santa Ana River Trail (SART) would be temporarily closed for 8 hours, up to four times over a span of two years for the placement of precast concrete girders. During these periods, SART users would be detoured. Construction vehicles would access the Santa Ana River from the gate and ramp at the Orange County access road at the northeast corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 feet east of the Project Area.

The project location is shown on Figure 1: Project Location (attached). Because all cultural resource efforts will be completed in compliance with Section 106 of the National Historic Preservation Act, you are being contacted per the Native American consultation guidelines of Section 106.

As part of the cultural resources studies, a records search for the Area of Potential Effects (APE) was completed at the South Central Coastal Information Center of the California Historical Resources Information System at California State University, Fullerton. The records search indicated there are no known prehistoric sites in the APE. One prehistoric site (described on the site record as a habitation site) was recorded approximately one mile from the APE. A Sacred Lands File search requested from the Native American Heritage Commission was negative for the APE. The archaeological pedestrian survey of the APE was also negative for cultural resources, with the exception of a single isolated shell fragment that was likely a recent deposit and not in its original location.

LSA

If you know of any cultural resources of religious and/or cultural significance to your community that may be affected, or if you would like more information, please do not hesitate to contact me at (949) 553-0666 or at kerrie.collison@lsa.net. If I do not receive a response from you, I will contact you again in the near future to discuss any comments or concerns you may have. Also, please feel free to forward this to others in your group whom you believe may have information that would be helpful in identifying cultural resources that could be affected by the project.

Thank you for your involvement in this process. Your comments are important, and I look forward to hearing from you.

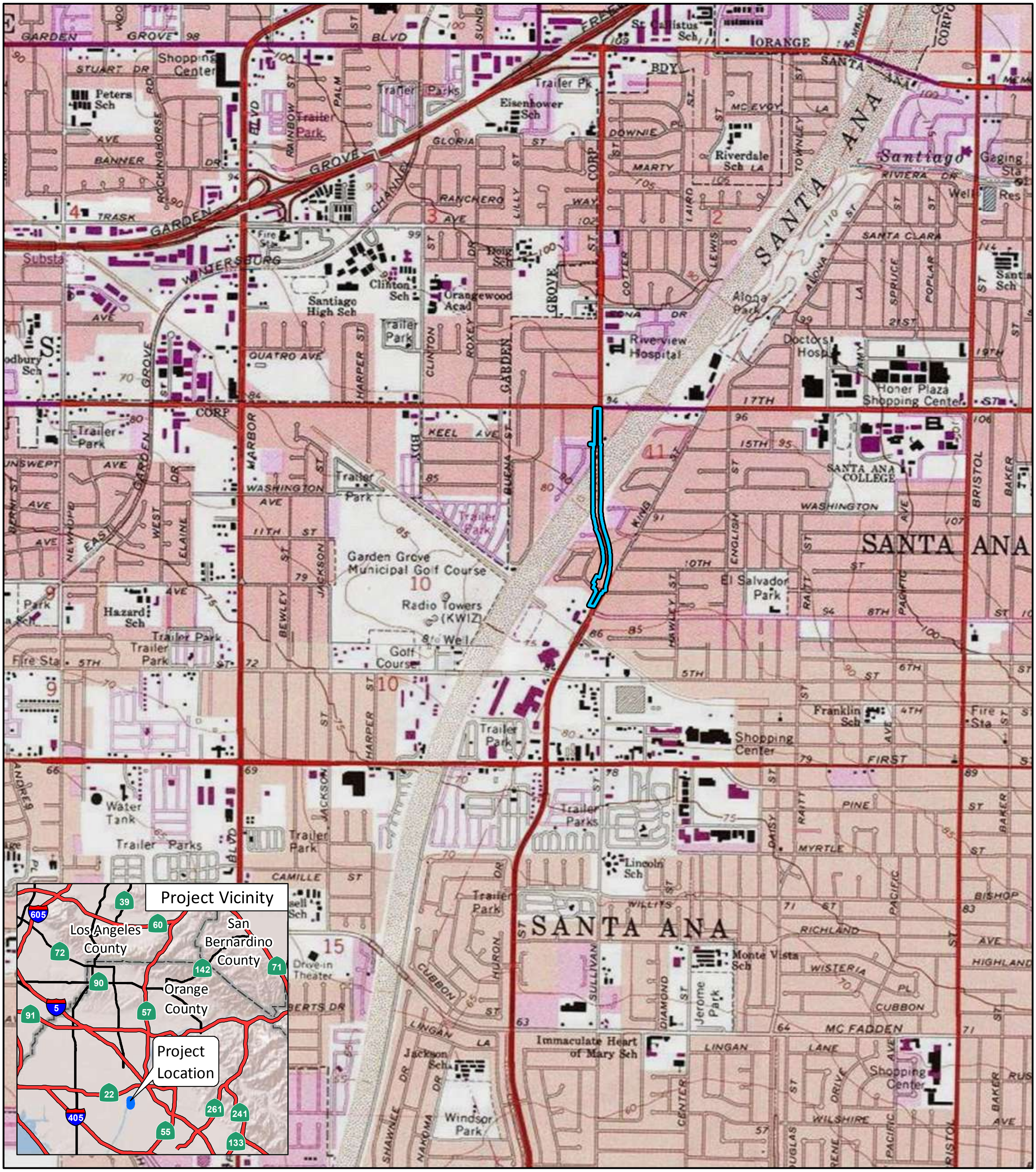
Respectfully,

LSA Associates, Inc.

Kerrie N Collison

Kerrie Collison, RPA
Cultural Resources Manager

Attachment: Figure 1: Project Location



LSA

LEGEND

Project Area

FIGURE 1

0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

Fairview Street Widening and Bridge Replacement

Project Location

I:\WKE1702\GIS\ProjectLocation.mxd (2/9/2018)

SAMPLE FOLLOW-UP EMAIL

Kerrie Collison

From: Kerrie Collison
Sent: Thursday, April 05, 2018 9:43 AM
To: tsen2u@hotmail.com
Subject: Section 106 Consultation for a proposed project in Orange County
Attachments: Section 106 Consultation- John Valenzuela.pdf

Good morning, Chairperson Valenzuela. I wanted to follow up on a Section 106 consultation invitation letter dated March 26, 2018, for the proposed Fairview Street Widening and Bridge Replacement project in Orange County. I've attached the letter for your reference. Please let me know at your earliest convenience if you have concerns about the project. Thank you in advance for your input.

Best,
Kerrie Collison

Kerrie Collison, RPA | Cultural Resources Manager
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
_ _ _ _ _ _ _ _ _ _ _ _ -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Administration Gabrieleno Indians <admin@gabrielenoindians.org>
Sent: Thursday, March 29, 2018 12:09 PM
To: Kerrie Collison
Subject: Kerrie collision-Santa Ana-Fairview St. Widening and Bridge Replacement Project
Attachments: Kerrie collision-Santa Ana-Fairview St. Widening and Bridge Replacement Project .pdf

Please see attachment

Sincerely,

Brandy Salas
Admin Specialist
Gabrieleno Band of Mission Indians - Kizh Nation
PO Box 393
Covina, CA 91723
Office: 844-390-0787
website: www.gabrielenoindians.org

GABRIELEÑO BAND OF MISSION INDIANS - KIZH NATION

Historically known as The San Gabriel Band of Mission Indians

recognized by the State of California as the aboriginal tribe of the Los Angeles basin

LSA
20 Executive Park Suite 200
Irvine, CA 92614

March 29, 2018

Re: Section 106 Fairview St. Widening and Bridge Replacement Project, Santa Ana Orange County

Dear Kerrie Collison,

Please find this letter as a written request for consultation regarding the Fairview St. Widening and Bridge Project in the City of Santa Ana, Orange County . Your project lies within our ancestral tribal territory, meaning descending from, a higher degree of kinship than traditional or cultural affiliation. Your project is located within a sensitive area and may cause a substantial adverse change in the significance of our tribal cultural resources. Most often, a records search for our tribal cultural resources will result in a "no records found" for the project area. The Native American Heritage Commission, ethnographers, historians, and professional archaeologists can only provide limited information that has been previously documented about California Native Tribes. This is the reason the Native American Heritage Commission (NAHC) will always refer the lead agency to the respective Native American Tribe of the area because the NAHC is only aware of general information and are not the experts on each California Tribe. Our Elder Committee & tribal historians are the experts for our Tribe and are able to provide a more complete history (both written and oral) regarding the location of historic villages, trade routes, cemeteries and sacred/religious sites in the project area. Therefore, to avoid adverse effects to our potential tribal cultural resources on your project site, at the consultation, we will be providing information pertaining to the significance of tribal cultural resources and the significance of the project's impacts to these resources. We will provide a variety of resources including, but not limited to; ethnography notes, maps, and oral history. We will also be prepared to discuss mitigation measures we feel are appropriate to protect our tribal cultural resources from substantial adverse change to their significance.

Consultation appointments are available during standard business hours on Wednesdays and Thursdays at our offices at 901 N. Citrus Ave. Covina, CA 91722 or over the phone. Please call toll free 1-844-390-0787 or email gabrielenoindians@yahoo.com to schedule an appointment.

With Respect,

Andrew Salas, Chairman

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Christina Swindall Martinez, secretary

Albert Perez, treasurer I | Martha Gonzalez Lemos, treasurer II | Richard Gradias, Chairman of the Council of Elders

PO Box 393, Covina, CA 91723 | www.gabrielenoindians.org | gabrielenoindians@yahoo.com

Kerrie Collison

From: Kerrie Collison
Sent: Thursday, March 29, 2018 12:35 PM
To: 'Administration Gabrieleno Indians'
Subject: FW: Fairview Street Widening and Bridge Replacement
Attachments: Kerrie collision-Santa Ana-Fairview St. Widening and Bridge Replacement ....pdf; Auto Response: Fairview Street Widening and Bridge Replacement

Hello. I just sent a message to the email address provided in your response letter, and received an automatic reply to instead contact you at this email address (attached). You may want to update your letters to include the correct contact information.

Please see the email below. Thank you.

Kerrie Collison, RPA | Cultural Resources Manager

From: Kerrie Collison
Sent: Thursday, March 29, 2018 12:31 PM
To: 'gabrielenoindians@yahoo.com'
Subject: Fairview Street Widening and Bridge Replacement

Chairman Salas,

Thank you for your letter regarding the Fairview Street Widening and Bridge Replacement Project in Santa Ana (attached). Before scheduling an appointment for consultation, it would be very helpful if you could provide more specific information regarding the sensitivity of the APE and the potential for substantial adverse change in the significance of tribal cultural resources.

Thank you.

Best regards,
Kerrie Collison

Kerrie Collison, RPA | Cultural Resources Manager
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
– – – – – – – – – – – -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Kerrie Collison
Sent: Thursday, March 29, 2018 2:43 PM
To: 'Administration Gabrieleno Indians'
Cc: Jonathan Wright (jonathan.wright@dot.ca.gov)
Subject: FW: Fairview Street Widening and Bridge Replacement
Attachments: Kerrie collision-Santa Ana-Fairview St. Widening and Bridge Replacement ....pdf

Good afternoon. Since your Tribal office is located in Los Angeles County, an office meeting to discuss this project will not be possible. Please let us know if you are able to participate in a teleconference. Thank you.

Kerrie Collison, RPA | Cultural Resources Manager

From: Andrew Salas [mailto:gabrielenoindians@yahoo.com]
Sent: Thursday, March 29, 2018 12:52 PM
To: Kerrie Collison
Cc: Matt Teutimez.Kizh Gabrieleno; Gary Stickel; Administration KNRM
Subject: Re: Fairview Street Widening and Bridge Replacement

Dear Mr. Kerrie
Thank you for your response , we would like to invite you to our tribal government office to provide your request . At your convenience please let us know a good time . Thank you

Sent from my iPhone

On Mar 29, 2018, at 12:31 PM, Kerrie Collison <Kerrie.Collison@lsa.net> wrote:

> Chairman Salas,
>
> Thank you for your letter regarding the Fairview Street Widening and Bridge Replacement Project in Santa Ana (attached). Before scheduling an appointment for consultation, it would be very helpful if you could provide more specific information regarding the sensitivity of the APE and the potential for substantial adverse change in the significance of tribal cultural resources.
>
> Thank you.
>
> Best regards,
> Kerrie Collison
>
> **Kerrie Collison, RPA** | Cultural Resources Manager
> LSA | 20 Executive Park, Suite 200
> Irvine, CA 92614
> – – – – – – – – – – – – -
> 949-553-0666 ext. 312 Tel
> 949-413-2134 Mobile
> Website
>
> <Kerrie collision-Santa Ana-Fairview St. Widening and Bridge Replacement ....pdf>

Kerrie Collison

From: Andrew Salas <gabrielenoindians@yahoo.com>
Sent: Friday, March 30, 2018 7:30 AM
To: Kerrie Collison
Cc: Matt Teutimez.Kizh Gabrieleno; Administration KNRM; gayle.totton@nahc.ca.gov
Subject: Fairview Street Widening and Bridge Replacement

Good morning Kerrie ,

Can you please have the lead agency contact us at their earliest convenience regarding this project . Thank you

Chairman Salas,

Thank you for your letter regarding the Fairview Street Widening and Bridge Replacement Project in Santa Ana (attached). Before scheduling an appointment for consultation, it would be very helpful if you could provide more specific information regarding the sensitivity of the APE and the potential for substantial adverse change in the significance of tribal cultural resources.

Thank you.

Best regards,
Kerrie Collison

Kerrie Collison, RPA | Cultural Resources Manager
LSA | 20 Executive Park, Suite 200
Irvine, CA 92614
– – – – – – – – – – – – -
949-553-0666 ext. 312 Tel
949-413-2134 Mobile
Website

Kerrie Collison

From: Wright, Jonathan M@DOT <jonathan.wright@dot.ca.gov>
Sent: Thursday, April 12, 2018 7:30 AM
To: admin@gabrielenoindians.org
Cc: Kerrie Collison; Baker, Charles A@DOT; gayle.totton@nahc.go
Subject: FW: Fairview Street Widening and Bridge Replacement

Good Morning,

I am writing to follow up regarding the Fairview Street Widening and Bridge Replacement project. As discussed below if there are any questions/concerns regarding Lead Agency status please let me know and I would more than happy to discuss. Additionally as outlined below if there is any interest in setting up a teleconference to discuss this project please let me know that as well and I will work on arranging a time that works for all parties. If anyone has any other concerns or questions regarding this project let me know and I will work on addressing any ASAP. Thank you for your time and consideration.

Jon

From: Wright, Jonathan M@DOT
Sent: Wednesday, April 4, 2018 3:31 PM
To: ':admin@gabrielenoindians.org' <:admin@gabrielenoindians.org>
Subject: FW: Fairview Street Widening and Bridge Replacement

FYI, there was a mail delivery failure.

From: Wright, Jonathan M@DOT
Sent: Wednesday, April 4, 2018 3:28 PM
To: 'gabrielenoindians@yahoo.com' <gabrielenoindians@yahoo.com>
Cc: Baker, Charles A@DOT (charles.baker@dot.ca.gov) <charles.baker@dot.ca.gov>; 'Kerrie Collison'

<Kerrie.Collison@lsa.net>; 'gayle.totton@nahc.gov' <gayle.totton@nahc.gov>
Subject: Fairview Street Widening and Bridge Replacement

Good Afternoon Andy,

I am following up in regards to your email response to Kerrie Collison to be in touch with a lead agency. First I would like to point out that there are two lead agencies involved in this project as it is a Local Assistance project. This means that Caltrans is the lead agency for the purposes of Section 106 and NEPA. For the purposes of CEQA the City of Santa Ana is the lead agency, including AB52. So in terms of AB52 and CEQA I have no authority to speak on behalf of the City of Santa Ana, your group will need to contact the City to engage in that specific coordination/ consultation. However for the purposes of Section 106 and NEPA I am interested in any information your group could provide regarding your knowledge of specific resources within the project area. I know that previously your group had requested a meeting at your office to discuss this project. Additionally as LSA had indicated based on my direction that as an office visit wouldn't be feasible we would be more than willing to conduct a phone teleconference. This remains the case and we would look forward to having such a teleconference if you are available to do so. If so please let me know when you are available and I will do my best to coordinate with all involved to participate. If you have any questions or concerns please let me know and I will address any as soon as possible. I look forward to the opportunity to speak with you and your group soon.

Thank You,

Jon

California Department of Transportation
District 12
Division of Environmental Analysis
1750 East 4th Street, Suite 100
Santa Ana, CA 92705

Caltrans

JONATHAN WRIGHT
Archaeologist
jonathan.wright@dot.ca.gov
Office (657) 328-6167
TTY 711

Integrity • Commitment • Teamwork • Innovation

VIEJAS
TRIBAL GOVERNMENT

P.O. Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

April 2, 2018

Kerrie Collison
Cultural Resources Manager
LSA
20 Executive Park, Suite 200
Irvine, CA 92614

Re: Fairview Street Widening and Bridge Replacement

Dear Ms. Collison,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

Attachment F

Historic Outreach

Historic Outreach Log

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project
City of Santa Ana, Orange County, California
BRLS 5063(184) - Caltrans District 12

Group	Outreach	Follow up	Comments
Santa Ana Historical Society 120 West Civic Center Drive Santa Ana, California 92701 714-547-9645 sahps@sahps.org	3/21/19 – letter and map mailed 4/24/19 – letter returned and resent via email		
Santa Ana History Room c/o Santa Ana Public Library 26 Civic Center Plaza M-75 Santa Ana, CA 92702 714-647-5280 SAHR@santa-ana.org	3/21/19 – letter and map mailed	4/24/19 – follow up email sent with letter and map attached.	
Heritage Museum of Orange County 3101 W. Harvard St. Santa Ana, CA 92704 714-540-0404 info@heritagemuseumoc.org	3/21/19 – letter and map mailed	4/24/19 – follow up email sent with letter and map attached.	
Phil Brigandi, Local Historian ockid1@gmail.com	3/21/19 – letter and map emailed	4/24/19 – follow up email sent with letter and map attached.	

LSA

CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

March 21, 2019

Santa Ana Historical Preservation
120 West Civic Center Drive
Santa Ana, California 92701
(714) 547-9645

Subject: Historic Outreach for the Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project in the City of Santa Ana, Orange County, California (LSA Project No. WKE1702)

To Whom It May Concern:

The City of Santa Ana, in conjunction with Caltrans District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that federally regulated undertakings, such as the proposed project, consider the effect they may have on historic properties. Research is currently underway and, pursuant to Section 36 CFR Part 800.3(e), LSA is soliciting your comments regarding any historic-period (50 years of age or older) resources that may exist within the project study area (attached Figure 1).

If you have any questions or comments regarding historic-period resources in or near the study area, please contact me at Casey.Tibbet@lsa.net or by telephone at (951) 781-9310. I would appreciate receiving your input by Friday, April 19, 2019.

Sincerely,

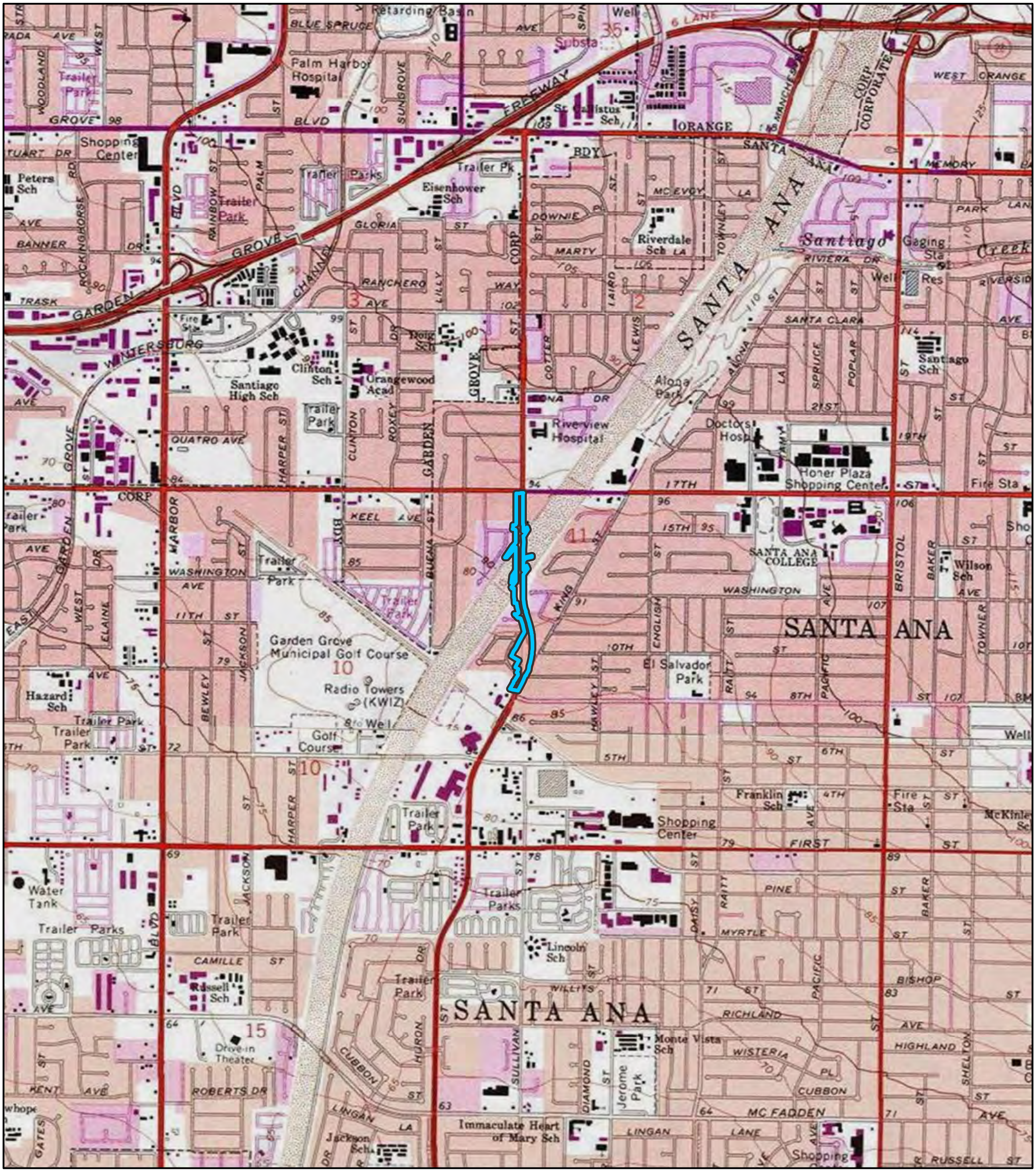
LSA ASSOCIATES, INC.

Casey Tibbet

Casey Tibbet, M.A.
Associate/Architectural Historian

Attachment: Figure 1

1500 Iowa Avenue, Suite 200, Riverside, California 92507 951.781.9310 www.lsa.net



LEGEND

Project Location

Figure 1

0 1000 2000
FEET

SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Project Location

Federal Project No.: BRLS 5063(184)

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To: SAHR@santa-ana.org
Subject: Fairview Street Project, Santa Ana
Attachments: SAHR.pdf

Hello,

This is a follow up to the letter I sent your organization on March 21, 2019.

Our records indicate the letter was received by Elizabeth Campos on March 27, 2019.

If you have any comments on the proposed project please contact me.

Thank you,

Casey Tibbet, M.A. | Associate/Architectural Historian
LSA | 1500 Iowa Avenue, Suite 200
Riverside, CA 92507
\- - - - - - - - - - - -
951-781-9310 Tel
Website

APPENDIX A

Location Hydraulic Study

LOCATION HYDRAULIC STUDY FORM *

Dist. __12__ Co.__Orange__Rte.__________P.M.__________
EA____15-6827______ Bridge No. 55C0513
Floodplain Description:
________________ Santa Ana River Floodplain ________________

1. Description of Proposal (include any physical barriers i.e. concrete barriers, soundwalls, etc. and design elements to minimize floodplain impacts)

City of Santa Ana proposes to widen the Fairview Street Bridge over the Santa Ana River in order to accommodate 6 lanes; 3 lanes in each direction.

2. ADT: Current 38,544 (2017) Projected___________

3. Hydraulic Data: Base Flood Q_{100}=__50,000__CFS
WSE_{100}=_____n/a____The flood of record, if greater than Q_{100}:
Q=____n/a____CFS WSE= _____________
Overtopping flood Q=______CFS WSE= _____________
Are NFIP maps and studies available? YES__X_____ NO_________

4. Is the highway location alternative within a regulatory floodway ?
YES__X_____ NO_________

5. Attach map with flood limits outlined showing all buildings or other improvements within the base floodplain.

Potential Q_{100} backwater damages:

A. Residences? NO___X_____YES_________
B. Other Bldgs? NO___X_____YES_________
C. Crops? NO___X_____YES_________
D. Natural and beneficial
FLOODPLAIN VALUES? NO_________YES__X_____

6. Type of Traffic:

A. Emergency supply or evacuation route? NO_________YES__X_____
B. Emergency vehicle access? NO_________YES__X_____
C. Practicable detour available? NO_________YES__X_____
D. School bus or mail route? NO_________YES __X_____

7. Estimated duration of traffic interruption for 100-year event hours:_____0______

8. Estimated value of Q_{100} flood damages (if any) – moderate risk level.

A.	Roadway	$_____0_____
B	Property	$_____0_____
	Total	$_____0_____

9. Assessment of Level of Risk Low__X_____
Moderate____
High________

For High Risk projects, during design phase, additional Design Study Risk Analysis May be necessary to determine design alternative.

Signature – Dist. Hydraulic Engineer _________________________Date________
(Item numbers 3,4,5,7,9)

Is there any longitudinal encroachment, significant encroachment, or any support of incompatible
Floodplain development? NO___X_____YES________

If yes, provide evaluation and discussion of practicability of alternatives in accordance with 23 CFR 650.113

Information developed to comply with the Federal requirement for the Location Hydraulic Study shall be retained in the project files.

Signature –Project Engineer______________________________Date____________
(Item numbers 1,2,6,8)

* Same as Figure 804.7A Technical Information for Location Hydraulic Study located in Chapter 804 of the Highway Design Manual

APPENDIX A

Noise Abatement Decision Report

Natural Environment Study

(Minimal Impacts)

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

City of Santa Ana, Orange County, California

District 12 - Orange
BRLS 5063(184)

December 2018

STATE OF CALIFORNIA
Department of Transportation

Prepared By: ______________________ Date: 12/5/18

Bo Gould, Biologist
(949) 553-0666
LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614

Approved By: ______________________ Date: 12/13/18

Lisa Sato
(657) 328-6136
Environmental Planner
Division of Environmental Analysis
California Department of Transportation, District 12
1750 East 4th Street
Santa Ana, CA 92705

Approved By: ______________________ Date: 12/14/18

Charles Baker
(657) 328-6139
Environmental Planning Specialist Branch Chief
California Department of Transportation, District 12
1750 East 4th Street
Santa Ana, CA 92705

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Charles Baker, Division of Environmental Analysis Specialist Branch, 1750 East 4th Street, Suite 100 Santa Ana, CA 92705, (657) 328-6139; or use the California Relay Service TTY to Voice (800) 735-2929, Voice to TTY (800) 735-2922, or 711.

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Summary

The City of Santa Ana, in conjunction with the California Department of Transportation, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge over the Santa Ana River.

The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

A Biological Study Area (BSA) was established to identify potential Project effects on specific sensitive biological resources and encompasses the Project direct impact areas (temporary and permanent) as well as a buffer area to account for any potential proximity effects (e.g., noise, vibration, dust, or lighting) that may occur outside the direct impact areas. The BSA is composed entirely of developed areas, with ornamental plantings and other urban vegetation generally considered to be of low value to native plant and wildlife species. No sensitive natural communities or wetlands occur within the BSA. No listed plant or animal species are expected to occur within the BSA or be adversely affected by the Project. To minimize the potential for impacts to nesting birds protected under the California Fish and Game Code, surveys for active bird nests are recommended within 3 days prior to commencement of vegetation removal or ground disturbance activities during the bird nesting season (February 1 to September 30). Because suitable bat roosting habitat is present in the existing Fairview Street bridge, several measures are recommended to avoid, reduce, and/or compensate for potential impacts on roosting bats associated with the proposed bridge demolition and construction activities.

The Project would replace the existing Fairview Street bridge over the Santa Ana River, which is considered a jurisdictional waterway. As such, the Project would require permit authorizations from the United States Army Corps of Engineers, Regional Water Quality Control Board, and/or the California Department of Fish and Wildlife.

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List of Abbreviated Terms

°F	degrees Fahrenheit
ac	acre/acres
amsl	above mean sea level
BMPs	Best Management Practices
BSA	Biological Study Area
Cal-IPC	California Invasive Plant Council
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
City	City of Santa Ana
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CWA	Clean Water Act
DPS	distinct population segment
EO	Executive Order
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
ft	foot/feet
GIS	geographic information system
HA	habitat absent
HP	habitat present
IPAC	Information, Planning, and Conservation System
MBTA	Migratory Bird Treaty Act
mi	mile/miles
MOU	Memorandum of Understanding

NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
OHWM	ordinary high water mark
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
PS&E	Plans, Specifications, and Estimate
RWQCB	Regional Water Quality Control Board
SART	Santa Ana River Trail
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1. Introduction

The City of Santa Ana (City), in conjunction with the California Department of Transportation (Caltrans) District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (Project) in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

Within the project limits, Fairview Street is bordered by single-family residences and a few commercial properties.

1.1. Project History

1.1.1. Project Purpose and Need

The Project Area has a history of traffic congestion; however, the Project would improve traffic flow and alleviate congestion in this area. The Project would also increase pedestrian safety at Fairview Street bridge by constructing new barrier rails, sidewalks, bicycle lanes, a raised median, and lighting on the proposed bridge structure.

1.1.1.1. Purpose

The purpose of the Project is to improve pedestrian/bicyclist safety and traffic flow on and in the vicinity of Fairview Street bridge. The following goals/objectives have been identified for the Project:

- Provide for adequate vehicular capacity and greater pedestrian and bike safety on Fairview Street bridge; and
- Make the Fairview Street bridge design and capacity consistent with the Orange County Master Plan of Arterial Highways and the City of Santa Ana (City) General Plan Circulation Element.

1.1.1.2. NEED

The existing Fairview Street bridge has insufficient safety barriers and capacity to handle existing and projected traffic levels in the Project Area and is operating with the following deficiencies:

- No sidewalks, bike lanes, center median or barrier, or lighting
- Congestion on and around the existing bridge due to high traffic demands and a limited number of lanes relative to areas north and south of the bridge

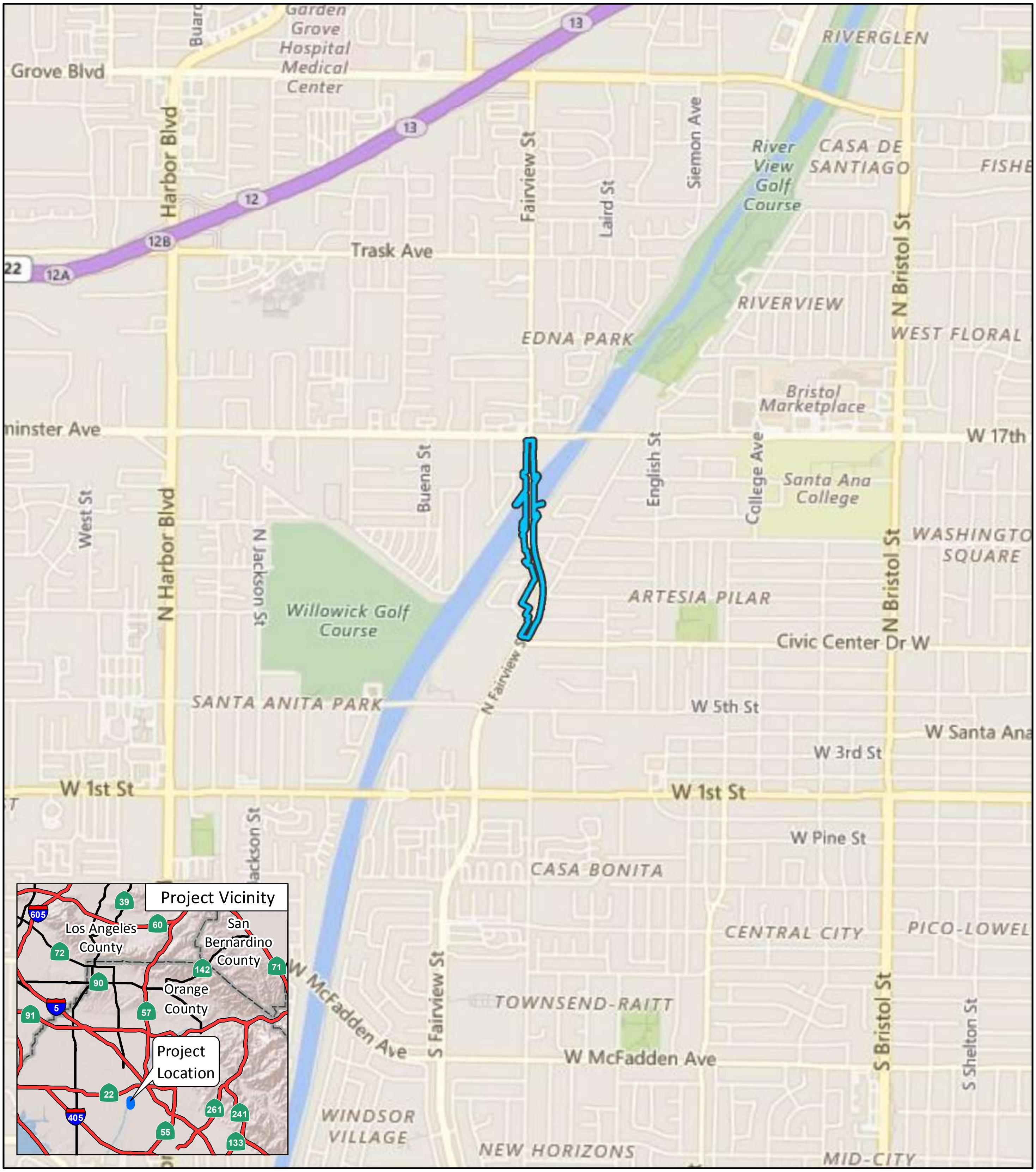
1.2. Project Description

The Project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (refer to Figure 1 for the Project Location). The Project would widen Fairview Street from two lanes in each direction to three lanes in each direction. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting. Figure 2 shows the location of each Project component as well as the Biological Study Area (BSA) established to identify potential Project effects on specific sensitive biological resources and encompasses the Project direct impact areas (temporary and permanent) as well as a buffer area to account for any potential proximity effects (e.g., noise, vibration, dust, or lighting) that may occur outside the direct impact areas.

The proposed bridge would be expanded from approximately 52 feet (ft) to 100 ft in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

The Project would acquire partial right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APNs) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]), as shown in Figure 2.

An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. These utilities would need to be temporarily relocated during construction and then permanently relocated to the new bridge.



LEGEND

Project Location

FIGURE 1

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Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Project Location

SOURCE: Bing (2015)

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LEGEND

- Biological Study Area (BSA)
- Proposed Right of Way Acquisition
- Proposed Roadway Widening
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- Proposed Construction Access
- Potential Noise Barriers
- Proposed Roadway Modifications
- Proposed Bridge Piers

0 100 200
FEET

SOURCE: Google (2016); WKE (2018)

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FIGURE 2

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Biological Study Area

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Water quality best management practices (BMPs) would be included to treat stormwater runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bikes would be detoured away from the Fairview Street bridge to the 17th Street bridge to cross the Santa Ana River by way of the Santa Ana River Trail (SART) between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists who wish to cross the Santa Ana River would be detoured to adjacent City streets such as King Street.

Construction of the Project would require temporary closure of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of the SART affected by project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detours are being coordinated with Orange County Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the river bed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the river bed as shown on Figure 2.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the Project Area (Figure 2). All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to pre-construction conditions or better prior to project completion. Construction is currently scheduled to start in the spring of 2020.

Construction is planned to last approximately 2 years, and no construction activities would last more than 5 years at any individual location.

2. Study Methods

2.1. Regulatory Requirements

2.1.1. Review of Jurisdiction Subject to Section 404 of the Clean Water Act

Pursuant to Section 404 of the Clean Water Act (CWA), the United States Army Corps of Engineers (USACE) regulates the discharge of dredged and/or fill material into waters of the United States. "Waters of the United States" is defined in 33 Code of Federal Regulations (CFR) Part 328 and currently includes: (1) all navigable waters (including all waters subject to the ebb and flow of the tide), (2) all interstate waters and wetlands, (3) all impoundments of waters mentioned above, (4) all tributaries to waters mentioned above, (5) the territorial seas, and (6) all wetlands adjacent to waters mentioned above.

2.1.2. Review of Jurisdiction Subject to Section 1600 of the California Fish and Game Code

Pursuant to Division 2, Chapter 6, Sections 1600–1602 of the California Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.

Unlike the USACE, the CDFW regulates not only the discharge of dredged or fill material, but all activities that alter streams and lakes and their associated habitats. These additional areas include some artificial stock ponds and irrigation ditches constructed on uplands and the riparian habitat supported by a river, stream, or lake regardless of the riparian area's federal wetland status. In addition, the lateral extent of a streambed may, in some situations, extend to include broader cross-sectional widths of drainages and floodplains above and beyond the area contained within the ordinary high water mark (OHWM), depending on the hydrological regime of a stream or river. For this reason, the dimensions of a CDFW jurisdictional streambed may vary substantially from the measured OHWM within the same stream or river.

2.1.3. Review of Jurisdiction Subject to Section 401 of the Clean Water Act

The Regional Water Quality Control Board (RWQCB) is responsible for the administration of Section 401 of the CWA. Typically, the areas subject to RWQCB jurisdiction coincide with those of the USACE (i.e., waters of the United States, including any wetlands). The RWQCB also asserts authority over waters of the State under waste discharge requirements pursuant to the Porter-Cologne Water Quality Control Act (Porter-Cologne Act).

2.1.4. Rivers and Harbors Act of 1899/General Bridge Act of 1946

The Rivers and Harbors Act is a federal law regulating activities that may affect navigation on the nation’s waterways, and a discussion of those sections follows.

Sections 9 and 10 of the Rivers and Harbors Act and Section 9 of the General Bridge Act require authorization for structures (including bridges) in or over any navigable waters of the U.S.

Section 14 of the Rivers and Harbors Act (33 United States Code 408), commonly referred to as “Section 408” provides that the Secretary of the Army, on the recommendation of the Chief of Engineers, may grant permission for the temporary occupation or use of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the United States. Permission from the USACE is required for the use, including modifications or alterations, of any flood control facility work built by the U.S. to ensure that the usefulness of the federal facility is not impaired. The permission for occupation or use is to be granted by the “appropriate real estate instrument in accordance with existing real estate regulations.” For USACE facilities, the Section 408 approval, known as Section 408 permit, is required.

2.1.5. Federal Endangered Species Act

Under provisions of Section 7(a)(2) of the Federal Endangered Species Act (FESA), a federal agency that permits, licenses, funds, or otherwise authorizes a project activity must consult with the United States Fish and Wildlife Service (USFWS) to ensure that its actions would not jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat that may be affected by the Project.

2.1.6. California Endangered Species Act

The California Endangered Species Act (CESA) is administered by CDFW and prohibits the take of plant and animal species identified as either threatened or endangered in the State of California by the Fish and Game Commission (Fish and

Game Code Sections 2050–2089). "Take" means hunt, pursue, catch, capture, or kill or attempt to hunt, pursue, catch, capture, or kill. Sections 2081 and 2080.1 of the CESA allow CDFW to authorize exceptions to the prohibition of take of State-listed as threatened or endangered plant and animal species for purposes such as public and private development.

2.1.7. Migratory Bird Treaty Act and Executive Order 13186

Native bird species and their parts (including eggs, nests, and feathers) are protected under the Migratory Bird Treaty Act (MBTA) (16 United States Code [USC] 703–712). The MBTA prohibits the take, possession, import, export, transport, selling, purchase, barter, or offering for sale any migratory bird, its eggs, parts, and nests, except as authorized under a valid permit.[1]

Executive Order (EO) 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies "… taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement an MOU with the Fish and Wildlife Service that promotes the conservation of migratory bird populations." On February 2, 2001, the Federal Highway Administration (FHWA) issued guidance on EO 13186 recommending various measures to assist with protecting migratory birds.

2.1.8. Invasive Species

On February 3, 1999, President Clinton signed 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." FHWA guidance issued August 10, 1999, directs the use of the State's noxious weed list to define the invasive plants that must be considered as part of the California Environmental Quality Act (CEQA) analysis for a proposed project.

[1] According to the Department of the Interior Solicitor's Opinion M-37050 dated December 22, 2017, the MBTA applies only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs.

2.2. Studies Required

2.2.1. Literature Search

Prior to performing the field survey, existing documentation relevant to the BSA was reviewed. To identify the existence and potential for occurrence of sensitive or special-status plant and animal species in the vicinity of the BSA, federal and state database records were reviewed within the nine United States Geological Survey (USGS) 7.5-minute topographic quadrangles surrounding the BSA, including the *Anaheim*, *Whittier*, *La Habra*, *Yorba Linda*, *Orange*, *Tustin*, *Newport Beach*, *Los Alamitos*, and *Seal Beach* quadrangles. Appendix A provides lists obtained from the following databases:

- **CDFW California Natural Diversity Database (CNDDB) *RareFind 5*:** This database covers special-status plant and animal species as well as special-status natural communities that occur within California. A list of occurrence records was generated on February 15, 2018, for a search area encompassing nine USGS 7.5-minute topographic quadrangles surrounding the BSA. This search was repeated on August 8, 2018, to verify that the latest occurrence records have been incorporated into the analysis.
- **California Native Plant Society (CNPS) *Online Inventory of Rare and Endangered Plants* (CNPS v8-02, 2018):** A list of plant species was generated on February 15, 2018, using a search area encompassing nine USGS 7.5-minute topographic quadrangles surrounding the BSA. This search was repeated on August 8, 2018, to verify that the latest occurrence records have been incorporated into the analysis.
- **Information, Planning, and Conservation System (IPAC), which is administered by the USFWS:** This database provides information about the federally covered resources within the vicinity of a proposed project. USFWS geographic information system (GIS) layers of critical habitat and aquatic resources mapped by the USFWS National Wetlands Inventory were also reviewed (USFWS 2018a). An unofficial USFWS trust resource report was generated for the BSA on February 15, 2018 (USFWS 2018b). An updated trust resource report was generated on October 28, 2018 and is included in Appendix A.
- **National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries), West Coast Region, California Species List Online Tool:** An official species list was received on March 16, 2018. An updated official species list was received on October 28, 2018, and is included in Appendix A.

The nine USGS quadrangles search covered a large, variable geographic and topographic area containing several biological hot spots such as the Newport Back Bay and the foothills of the Santa Ana Mountains, which contain habitat types not found within or around the BSA. The following species identified in the CNDDB records search are not included in Appendix A due to the lack of suitable habitat within and surrounding the BSA: green sea turtle (*Chelonia mydas*), western tidal-flat tiger beetle (*Cicindela gabbii*), sandy beach tiger beetle (*Cicindela hirticollis gravida*), western beach tiger beetle (*Cicindela latesignata latesignata*), senile tiger beetle (*Cicindela senilis frosti*), globose dune beetle (*Coelus globosus*), and wandering saltmarsh skipper (*Panoquina errans*).

2.2.2. Field Reviews

General and focused field surveys were conducted in February and June 2018 to characterize the biological and aquatic resources occurring on the Project site and to ascertain the presence or absence of sensitive plants and animals or the likelihood of their occurrence in the BSA.

Specific field surveys included: (1) a general reconnaissance-level biological resources survey and habitat assessment, (2) a jurisdictional delineation survey, (3) a daytime bat habitat suitability assessment, and (4) a nighttime bat emergence survey conducted during the typical bat maternity roosting season. The methods used during each of these survey efforts are described in the following sections.

2.2.3. Survey Methods

2.2.3.1. BIOLOGICAL RESOURCES SURVEY AND HABITAT ASSESSMENT

A general reconnaissance-level biological resources survey and habitat assessment was conducted by walking throughout the BSA (Figure 2). The areas directly accessed included areas within the public right-of-way and where permission to enter was granted (e.g., the Santa Ana River). During the course of the survey, the BSA was assessed for the presence of sensitive plant species, vegetation communities, wildlife, and the suitability/quality of habitat. A list of all plant and wildlife species observed or otherwise detected during the surveys is included in Appendix B. Appendix C contains representative site photos taken during the survey.

Plant communities and land cover types were determined in general accordance with categories set forth in the *Orange County Habitat Classification System* (Gray and Bramlet 1992). This system was developed by the County of Orange and is based on the 1986 *Preliminary Description of the Terrestrial Natural Communities of California* by Robert Holland, with some revisions to more clearly define Orange

County habitats and other land cover types. Vegetation communities and land cover types within the BSA were assessed in the field, and a 1″=100′ scale aerial photograph was used to provide locational references.

2.2.3.2. Jurisdictional Delineation

Areas of potential jurisdiction were evaluated according to the most current USACE and CDFW regulatory criteria and guidance for the region (USACE 2008a, 2008b, 1992, 1991; Supreme Court of the United States 2006; RWQCB 2004). The boundaries of the potential jurisdictional areas within the BSA were observed in the field and mapped on an aerial photograph (1″ = 100′ scale). Measurements of federal and State jurisdictional areas mapped during the course of the field investigation were determined by a combination of direct measurements taken in the field and measurements taken from the aerial photograph. Appendix D, Jurisdictional Delineation Report, provides further details regarding this survey effort.

2.2.3.3. Daytime Bat Habitat Suitability Assessment

A daytime bat habitat suitability assessment was conducted to determine whether suitable bat roosting habitat is present in the Fairview Street bridge and immediate vicinity. A 300 ft buffer surrounding the bridge was included because of the potential for indirect impacts from Project-related lighting and/or noise.

During the bat habitat assessment, the underside of the bridge structure was accessed on foot and examined to locate any potential bat roosting sites as well as evaluate the potential for bat foraging and roosting activity in the vicinity of the structure. Potential bat roosting sites were identified by examining the bridge for any structural features (e.g., crevices or recessed spaces) that may be suitable for use as day- or night-roosting habitat. Once identified, these areas were examined with a high-powered spotlight for the presence of bats or bat sign (e.g., guano, urine staining, or vocalizations) that would indicate current or past use of that feature by roosting bats. Because the presence of adjacent foraging habitat increases the desirability of a structure as a potential roost site, potential foraging habitat was also assessed within and immediately adjacent to the structures on the basis of vegetation composition, presence of water, connectivity to other areas providing suitable foraging or roosting habitat, and accessibility.

2.2.3.4. Nighttime Bat Emergence Survey

The presence or absence of bat maternity colonies could not be confirmed during the daytime bat habitat suitability assessment because the structures were examined outside the bat maternity season (April 1–August 31). Therefore, a nighttime emergence survey was conducted on June 15, 2018, in order to determine whether the roosting features identified during the habitat assessment are occupied by special-status bat species or bat colonies.

The survey was initiated one-half hour before sunset and continued until one full hour after sunset. Observers were stationed at vantage points in positions that would optimize visibility of any bats that may exit or enter the roost feature(s) being surveyed, and to correlate the acoustic data recorded with visual observations. Acoustic detectors were placed in locations where they could record any bats emerging from adjacent roost features as well as to detect foraging bats.

2.3. Personnel and Survey Dates

Table 1 provides the survey types, dates, and personnel involved during the survey efforts.

Table 1: Survey Data

Survey Type	Survey Date(s)	Survey Personnel
General Biological Resources Survey and Habitat Assessment	February 20, 2018	Bo Gould and Lonnie Rodriguez
Jurisdictional Delineation	February 20, 2018	Lonnie Rodriguez and Bo Gould
Daytime Bat Habitat Suitability Assessment	February 13, 2018	Jill Carpenter and Heather Monteleone
Nighttime Bat Emergence Survey	June 15, 2018	Jill Carpenter, Heather Monteleone, Lonnie Rodriguez, and Bo Gould

2.4. Agency Coordination and Professional Contacts

No resource agency coordination has occurred to date. No USFWS coordination beyond the IPaC trust resource report is anticipated because there is no habitat for listed species in the BSA. Impacts to potentially jurisdictional waters located within the BSA (e.g., the Santa Ana River channel) would be within the allowable parameters of the USACE Nationwide Permit Program. Future coordination with the USACE, CDFW, and RWQCB would occur due to proposed work in the Santa Ana River channel, which is a known jurisdictional waterway.

2.5. Limitations That May Influence Results

The collection of biological field data is normally subject to environmental factors that cannot be controlled or reliably predicted. Consequently, the interpretation of field data must be conservative and consider the uncertainties and limitations necessarily imposed by the environment. However, due to the experience and qualifications of the consulting biologists involved in the surveys and the lack of native habitat in the BSA, this limitation is not expected to severely influence the results or substantially alter the findings.

Although information was gathered from the entire BSA, Project effects discussed in this report are considered for biological resources that fall within the Project footprint and in adjacent areas that may be directly or indirectly affected by the Project.

3. Results: Environmental Setting

3.1. Description of the Existing Biological and Physical Conditions

3.1.1. Study Area

The BSA is located on the *Anaheim, California* 7.5-minute series USGS topographic map (Figure 1). Figure 2 shows the limits of the BSA and provides an aerial view of the Project Area.

The BSA is located in Santa Ana in Orange County along North Fairview Street between West Civic Center Drive and West 17th Street. The 27.32-acre (ac) BSA (shown on Figure 2) encompasses the Project direct impact areas (temporary and permanent) as well as a buffer area to account for any potential proximity effects (e.g., noise, vibration, dust, or lighting) that may occur outside the direct impact areas.

3.1.2. Physical Conditions

The BSA is almost entirely developed with residential, commercial, and transportation uses. Vegetation within the BSA primarily consists of ornamental trees and shrubs, lawns, and several disturbed and barren areas. Fairview Triangle contains ornamentally planted native trees and shrubs, and is located in the central portion of the BSA adjacent to the Santa Ana River.

Elevations range from approximately 80 to 95 ft above mean sea level (amsl) across the entire BSA. The topography of the BSA gently slopes downhill from east to west. The climate is classified as Mediterranean (i.e., arid climate with hot, dry summers and moderately mild, wet winters), with the average annual precipitation being 13.6 inches. Although most of the precipitation occurs from November through March, thunderstorms may occur at other times of the year and can cause high precipitation rates. On average, monthly high temperatures range between 69 degrees Fahrenheit (°F) and 85°F, and monthly low temperatures range between 46°F and 64°F.

The Project is located within the Santa Ana River Watershed, which covers an area of approximately 210 square miles in Orange County. The headwaters of the entire 2,650-square-mile Santa Ana River Watershed begin in the San Bernardino Mountains and cross Riverside and Orange Counties before ultimately entering the Pacific Ocean. Flows within the Santa Ana River can be attributed to storm water runoff, urban runoff, and treated wastewater.

3.1.3. Biological Conditions in the Study Area

The primary vegetation/land cover type in the BSA is classified as developed with four subtypes, including flood control channels, transportation, ornamental landscaping, and disturbed or barren. The BSA is located within urban portions of Santa Ana with no connection to undisturbed or natural lands.

3.1.3.1. Flood Control Channels

As discussed in the corresponding *Jurisdictional Delineation Report* (Appendix D), the existing Fairview Street bridge crosses over the Santa Ana River, which has been channelized and lined with concrete within the BSA for flood control purposes.

3.1.3.2. Transportation

A large portion of the BSA consists of North Fairview Street and adjacent residential streets. A portion of the SART that crosses under Fairview Street bridge is also located within the BSA.

3.1.3.3. Ornamental Landscaping

All vegetation within the BSA is ornamentally planted and consists primarily of street trees, ornamental shrubs, and turf grass lawns. As previously mentioned, Fairview Triangle is located in the central portion of the BSA adjacent to the Santa Ana River and contains ornamentally planted native trees and shrubs. All vegetation within the BSA appears to be regularly maintained.

3.1.3.4. Disturbed or Barren

Several areas within the BSA along the SART are classified as disturbed or barren, with bare ground and sparse ruderal/weedy vegetation cover. The weeds in these areas appear to be regularly maintained as part of maintenance work along the SART.

3.1.4. Habitat Connectivity

The highly developed nature of the BSA presents various impediments to wildlife movement, including roads, walls, fences, buildings, and lack of vegetative cover. Furthermore, there are no large open space areas or designated significant ecological areas in proximity to the BSA. Mammals such as coyote, raccoon, opossum, and skunk have adapted to densely developed urban environments and may utilize the Santa Ana River as a movement corridor; however, the lack of vegetative cover within the concrete channel and high level of anthropogenic disturbance may limit use. Mature ornamental trees may serve as habitat linkages for urban-tolerant bird species.

3.1.5. Regional Species and Habitats and Natural Communities of Concern

3.1.5.1. REGIONAL SPECIES

An unofficial USFWS list of threatened, endangered, and proposed species, designated critical habitat, and candidate species that may occur within the vicinity of the BSA was obtained in February 2018 (Appendix A). An official NOAA Fisheries list was also obtained in March 2018. These lists contain three species (one plant and two wildlife species) that are federally and/or State-listed as endangered or threatened: Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*), coastal California gnatcatcher (*Polioptila californica californica*), and Southern California steelhead trout (*Oncorhynchus mykiss irideus*; distinct population segment [DPS]). None of these species are expected to occur within the BSA or to be affected by the Project.

Nine non-listed special-status species have historical records within approximately 3 miles (mi) of the BSA, with the majority of records being over 70 years old (CDFW 2018). Of the special-status species identified in the literature review, only one was observed in the BSA during the field surveys (Cooper's hawk [*Accipiter cooperii*]). Tables 2a and 2b provide respective summaries of the special-status plant and wildlife species that were identified in the literature review as potentially occurring in the general Project Vicinity, their habitat requirements, and rationale regarding their potential to occur within the BSA.

3.1.5.2. HABITATS

USFWS and CNDDB records show no critical habitat or other special-status habitats occurring within or adjacent to the BSA. There are no natural vegetation communities or wetlands occurring within the BSA.

Table 2a: Listed, Proposed, and Special-Status Plant Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Rationale
chaparral sand-verbena	*Abronia villosa* var. *aurita*	US: - CA: S2 CNPS: 1B.1	Annual herb. Occurs on sandy soils in chaparral, coastal scrub, and desert dune habitats between 75 and 1600 meters in elevation.	HA	There is one historical occurrence in the vicinity of the BSA, but the population is presumed to be extirpated (CNDDB 1924). Suitable habitat does not occur within the BSA.
aphanisma	*Aphanisma blitoides*	US: – CA: S2 CNPS: 1B.2	Sandy or clay soils on slopes or bluffs near the ocean, usually in coastal bluff scrub, coastal dunes, or coastal scrub, below 305 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Ventura marsh milk-vetch	A*stragalus pycnostachyus* var. *lanosissimus*	US: FE CA: SE CNPS: 1B.1	Perennial herb. Occurs in coastal dunes, coastal scrub, marshes and swamps (edges, coastal salt or brackish) up to 35 meters in elevation.	HA	This perennial herb was not observed during the site survey, and suitable habitat does not occur within the BSA.
Coulter's saltbush	*Atriplex coulteri*	US: - CA: S1/S2 CNPS: 1B.2	Perennial herb. Occurs on alkaline or clay soils in coastal dune, coastal scrub, and valley and foothill grassland habitats up to 460 meters in elevation.	HA	This perennial herb was not observed during the site survey, and suitable habitat does not occur within the BSA.
south coast saltscale	*Atriplex pacifica*	US: – CA: S2 CNPS: 1B.2	Annual herb. Found in alkaline soils in coastal scrub, coastal dunes, coastal playas, and coastal bluff scrub habitats below 140 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Parish's brittlescale	*Atriplex parishii*	US: - CA: S1 CNPS: 1B.1	Annual herb. Occurs on alkaline soils in playas, vernal pools, and chenopod scrub habitats between 25 meters and 1,900 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA and suitable habitat does not occur within the BSA.
Davidson's saltscale	*Atriplex serenana* var. *davidsonii*	US: - CA: S1 CNPS: 1B.2	Annual herb. Found on alkaline soils in coastal bluff scrub and coastal scrub up to 200 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
intermediate mariposa lily	*Calochortus weedii var. intermedius*	US: - CA: S2 CNPS: 1B.2	Perennial bulbiferous herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland. Often in dry, rocky soils. From 120 to 855 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Table 2a: Listed, Proposed, and Special-Status Plant Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Rationale
lucky morning-glory	*Calystegia felix*	US: - CA: S1 CNPS: 1B.1	Annual rhizomatous herb. Occurs in meadows, seeps, and alluvial riparian scrub habitats (sometimes alkaline soils) up to 215 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Lewis' evening-primrose	*Camissoniopsis lewisii*	US: - CA: S4 CNPS: 3	Annual herb. Occurs on sandy and clay soils in coastal scrub, cismontane woodland, and grassland habitats up to 300 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
southern tarplant	*Centromadia parryi* ssp. *australis*	US: - CA: S2 CNPS: 1B.1	Annual herb. Occurs in vernal pools, margins of marshes and swamps, and vernally mesic valley and foothill grasslands, sometimes with saltgrass on alkaline soils. Up to 427 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
salt marsh bird's-beak	*Chloropyron maritimum* ssp. *maritimum*	US: FE CA: CE CNPS: 1B.2	Annual herb (hemiparasitic). Occurs in coastal dune and salt marsh habitats between 0 meter and 30 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
San Fernando Valley spineflower	*Chorizanthe parryi* var. *fernandina*	US: FC CA: CE CNPS: 1B.1	Annual herb. Occurs in sandy soils within coastal scrub and grassland habitats between 150 meters and 1,220 meters in elevation.	HA	Presumed extirpated from most of Orange County. Suitable habitat does not occur within the BSA.
many-stemmed dudleya	*Dudleya multicaulis*	US: - CA: S2 CNPS: 1B.2	Perennial herb. Occurs in chaparral, coastal scrub, and valley and foothill grassland usually in heavy, often clayey soils. Up to 722 meters in elevation.	HA	This perennial herb was not observed during the site survey. Suitable habitat does not occur within the BSA.
Laguna beach dudleya	*Dudleya stolonifera*	US: FT CA: CT CNPS: 1B.1	Perennial herb. Rocky areas (generally north-facing sandstone cliffs) up to 260 meters in elevation. Known only from Orange County, California, near Laguna Beach, with most occurrences in Laguna Canyon west of SR-73.	HA	This perennial herb was not observed during the site survey. Suitable habitat does not occur within the BSA.

Table 2a: Listed, Proposed, and Special-Status Plant Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Rationale
Santa Ana River woollystar	*Eriastrum densifolium* ssp. *sanctorum*	US: FE CA: CE CNPS: 1B.1	Perennial herb. Occurs on sandy substrates within chaparral and alluvial fan scrub habitats between 91 meters and 610 meters in elevation.	HA	Presumed extirpated from Orange County. Suitable habitat does not occur within the BSA.
San Diego button-celery	*Eryngium aristulatum* var. *parishii*	US: - CA: S1 CNPS: 1B.1	Annual/perennial herb. Occurs in coastal scrub, valley and foothill grassland, and vernal pools between 65 meters and 620 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Los Angeles sunflower	*Helianthus nuttallii* ssp. *parishii*	US: - CA: SH CNPS: 1A	Perennial rhizomatous herb. Occurs in marshes and swamps (coastal salt and freshwater) between 10 meters and 1,525 meters elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA. Species is presumed extinct.
smooth tarplant	*Hemizonia pungens* ssp. *laevis*	US: - CA: S2 CNPS: 1B.1	Annual herb. Occurs on alkaline substrates within chenopod scrub, meadows and seeps, playas, riparian woodland, and grassland habitat up to 640 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
vernal barley	*Hordeum intercedens*	US: CA: S3/S4 CNPS: 3.2	Annual herb. Occurs in coastal dunes, coastal scrub, Valley and foothill grassland (saline flats and depressions), and vernal pools between 5 meters and 1,000 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
decumbent goldenbush	*Isocoma menziesii* var. *decumbens*	US: - CA: S2 CNPS: 1B.2	Perennial shrub. Occurs in chaparral, coastal scrub (sandy, often in disturbed areas) between 10 meters and 135 meters in elevation.	HA	This perennial shrub was not observed during the site survey. Suitable habitat does not occur within the BSA.
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	US: - CA: S2 CNPS: 1B.1	Annual herb. Occurs in marshes and swamps, playas, and vernal pools up to 1,220 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
mud nama	*Nama stenocarpa*	US: - CA: S1/S2 CNPS: 2B.2	Annual/perennial herb. Occurs in marshes and swamps (lake margins, riverbanks) between 5 meters and 500 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Table 2a: Listed, Proposed, and Special-Status Plant Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Rationale
Gambel's water cress	*Nasturtium gambelii*	US: FE CA: CT CNPS: 1B.1	Perennial rhizomatous herb. Occurs in marshes and swamps (freshwater or brackish) between 5 meters and 330 meters in elevation.	HA	There is one historical occurrence in the vicinity of the BSA, but the population is presumed to be extirpated (CNDDB 1927). Suitable habitat does not occur within the BSA.
prostrate vernal pool navarretia	*Navarretia prostrata*	US: - CA: S2 CNPS: 1B.1	Annual herb. Occurs on mesic soils in coastal scrub, meadows and seeps, vernal pools, and valley and foothill grassland habitats between 3 meters and 1,210 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
coast woolly-heads	*Nemacaulis denudate* var. *denudate*	US: - CA: S2 CNPS: 1B.2	Annual herb. Occurs in coastal dunes between 0 meter and 100 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
California Orcutt grass	*Orcuttia californica*	US: FE CA: CE CNPS: 1B.1	Annual herb. Occurs in vernal pool habitats between 15 meters and 660 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
south coast branching phacelia	*Phacelia ramosissima* var. *austrolitoralis*	US: CA: S3 CNPS: 3.2	Perennial herb. Usually occurs on sandy substrates within chaparral and coastal scrub, dune, and marsh habitats up to 300 meters in elevation.	HA	This perennial herb was not observed during the site survey, and suitable habitat does not occur within the BSA.
Allen's pentachaeta	*Pentachaeta aurea* ssp. *allenii*	US: - CA: S1 CNPS: 1B.1	Annual herb. Occurs in chaparral and coastal scrub openings and valley grassland habitats from 75 meters to 520 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Brand's star phacelia	*Phacelia stellaris*	US: - CA: S1 CNPS: 1B.1	Annual herb. Occurs in coastal dune and coastal scrub habitats up to 400 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Sanford's arrowhead	*Sagittaria sanfordii*	US: - CA: S3 CNPS: 1B.2	Perennial rhizomatous herb (emergent). Occurs in marshes and swamps (assorted shallow freshwater) from 0 meter to 650 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
chaparral ragwort	*Senecio aphanactis*	US: - CA: S2 CNPS: 2B.2	Annual herb. Occurs in chaparral, coastal scrub, and cismontane woodland habitats up to 800 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Table 2a: Listed, Proposed, and Special-Status Plant Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Rationale
salt spring checkerbloom	*Sidalcea neomexicana*	US: - CA: S2 CNPS: 2B.2	Perennial herb found in alkaline and mesic soils within chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas from 15 meters to 1530 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
estuary seablite	*Suaeda esteroa*	US: - CA: S2 CNPS: 1B.2	Perennial herb found in coastal marshes and swamps up to 5 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
San Bernardino aster	*Symphyotrichum defoliatum*	US: - CA: S2 CNPS: 1B.2	Perennial rhizomatous herb. Occurs near ditches, springs, and streams in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, mashes and swamps, and grasslands between 2 meters and 2,040 meters in elevation.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Status:
- CCS = NCCP Conditionally Covered Species
- CE = California Endangered
- CFP = California Fully Protected Species
- CSA = California Special Animal
- CSP = California Special Plant
- CT = California Threatened
- FC = Federal Candidate
- FD = Federal Delisted
- FE = Federal Endangered
- FP, FPE, FPT = Federal Proposed
- FT = Federal Threatened
- IS = NCCP Identified Species
- S1 = Critically Imperiled
- S2 = Imperiled
- S3 = Vulnerable
- S4 = Apparently Secure
- SH = Historical Records
- SSC = California Species of Special Concern
- TS = NCCP Target Species

CNPS Designations:
- 1B = Rare threatened, or endangered in California and elsewhere
- 2B = Rare, threatened, or endangered in California, but not elsewhere
- 3 = Not very endangered in California
- 4 = Plants of Limited Distribution – Watch List

Abbreviation/Acronym Definitions:
- BSA = Biological Study Area
- CA = California
- CNPS = California Native Plant Society
- NCCP = Natural Communities Conservation Plan
- SR-73 = State Route 73
- US = United States

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
INVERTEBRATES					
crotch bumble bee	*Bombus crotchii*	US: - CA: CSA	Found from coastal California east to the Sierra-Cascade crest and south into Mexico. Feeds on *Antirrhinum* ssp., *Phacelia* ssp., *Clarkia* ssp., *Dendromecon* ssp., *Eschscholzia* ssp., and *Eriogonum* ssp.	HA	There is a historical occurrence record in the vicinity of the BSA (CNDDB 1942), but most suitable habitat containing food plant species has been developed and the species is likely extirpated from the area.
San Diego fairy shrimp	*Branchinecta sandiegonensis*	US: FE CA: -	Endemic to vernal pools in Orange and San Diego Counties. Usually appears in late fall, winter, and spring when rains fill the small, shallow, seasonal pools.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
monarch butterfly (California overwintering population)	*Danaus plexippus*	US: - CA: CSA	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (e.g., eucalyptus, Monterey pine, cypress) with nectar and water sources nearby.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
AMPHIBIANS					
western spadefoot	*Spea hammondii*	US: - CA: SSC	Occurs primarily in grassland and other relatively open habitats. Found in elevations ranging from sea level to 4,500 feet. Requires temporary pools for breeding.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
REPTILES					
southern California legless lizard	*Anniella stebbinsi*	US: - CA: SSC	Occurs in coastal sand dunes, sandy washes, and alluvial fans. Prefers moist warm loose soil with plant cover. Moisture is essential.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
orange-throated whiptail	*Aspidoscelis hyperythra*	US: - CA: CSA	Inhabits low-elevation coastal scrub, chaparral, and valley hardwood habitats. Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food, termites.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
coastal whiptail	*Aspidoscelis tigris stejnegeri*	US: - CA: SSC	Occurs in deserts and semiarid areas with sparse vegetation. Often found in woodland and riparian areas.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
red diamond rattlesnake	*Crotalus ruber*	US: - CA: SSC	Associated with chaparral, woodland, grassland, and desert communities from Los Angeles County to Baja California Sur. Prefers rocky areas with dense vegetation. Needs rodent burrows, cracks in rocks, or surface cover objects for shelter.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
western pond turtle	*Emys marmorata*	US: - CA: SSC	Occurs in a variety of habitats, including woodland, grassland, and open forest. Thoroughly aquatic, existing in good-quality ponds, marshes, rivers, streams, and irrigation ditches that have rocky or muddy bottoms. Requires basking sites such as partially submerged logs, vegetation mats, or open mud banks.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
coast horned lizard	*Phrynosoma blainvillii*	US: - CA: SSC	Occurs in CSS, open chaparral, riparian woodland, and annual grassland habitats that support adequate prey species.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
coast patch-nosed snake	*Salvadora hexalepis virgultea*	US: - CA: SSC	Occurs in semi-arid brushy habitats (CSS), chaparral, rocky hillsides, and plains.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
BIRDS					
Cooper's hawk (nesting)	*Accipiter cooperii*	US: - CA: CSA	Nests in a wide variety of woodland and forest habitats.	HP	The species was observed foraging over the BSA and perching on nearby trees during the February 20, 2018 site survey. Suitable nesting habitat (mature trees) is limited in the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
tricolored blackbird (nesting colony)	*Agelaius tricolor*	US: - CA: SSC	Highly colonial nester largely endemic to California. Most numerous in the Central Valley and vicinity. Requires open water, protected nesting substrate, and a foraging area with insect prey within a few kilometers of the colony.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Southern California rufous-crowned sparrow	*Aimophila ruficeps canescens*	US: - CA: CSA	Resident in Southern California CSS and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
grasshopper sparrow (nesting)	*Ammodramus savannarum*	US: - CA: SSC	Occurs in dense grasslands, preferring native grasslands with a mixture of forbs and shrubs.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
Great blue heron (nesting colony)	*Ardea herodias*	US: - CA: CSA	Found in freshwater and saltwater marsh habitats. Also forages in grasslands and agricultural fields. Most breeding colonies are located near feeding areas, often in isolated swamps or on islands, and near lakes and ponds bordered by forests.	HA	While individuals may forage along the Santa Ana River, suitable nesting colony habitat is absent in the BSA.
long-eared owl	*Asio otus*	US: - CA: SSC	Occurs in dense coniferous or deciduous forest habitats, often near more open foraging habitat.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
burrowing owl (burrow sites and some wintering sites)	*Athene cunicularia*	US: - CA: SSC	Burrows in open, dry, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent on burrowing mammals, most notably the California ground squirrel.	HA	There are no known occurrences in the general vicinity of the BSA, and suitable habitat does not occur within the BSA. No small mammal burrows were observed within one vacant lot located partially within the BSA.
ferruginous hawk (wintering)	*Buteo regalis*	US: - CA: CSA	Found in open country in western North America; migrates north to Canada in summer and south to Mexico in winter.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
Swainson's hawk	*Buteo swainsoni*	US: - CA: CT	Found in open habitats (e.g., grasslands, sage flats and prairies) in western North America; migrates south to Argentina during the winter.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
coastal cactus wren (San Diego and Orange counties only)	*Campylorhynchus brunneicapillus sandiegensis*	US: - CA: SSC	Occurs in CSS habitats. Requires tall *Opuntia* cactus for nesting and roosting.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
western snowy plover	*Charadrius alexandrinus nivosus*	US: FT CA: SSC	Occurs on barren to sparsely vegetated sand beaches, dry salt flats in lagoons, dredge spoils deposited on beach or dune habitat, levees and flats at salt-evaporation ponds, river bars, along alkaline or saline lakes, reservoirs, and ponds.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
western yellow-billed cuckoo (nesting)	*Coccyzus americanus occidentalis*	US: FT CA: CE	Nests in expansive riparian forest habitats along the broad lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods with understory of blackberry, nettle, or grape.	HA	There is one historical (nonspecific) occurrence record in the general vicinity of the BSA, although the species is presumed extirpated from this area (CNDDB 1918). Suitable habitat does not occur within the BSA.
yellow rail	*Coturnicops noveboracensis*	US: - CA: SSC	Occurs in shallow marshes and wet meadows. During winter, may occupy drier freshwater and brackish marshes as well as dense, deep grass and rice fields.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
white-tailed kite	*Elanus leucurus*	US: - CA: FP	Breeds in riparian trees such as oaks, willows, and cottonwoods in lower-elevation areas, particularly coastal valleys and plains. Forages in open areas and grasslands.	HA	There are no known occurrences in the vicinity of the BSA, and suitable nesting habitat does not occur within the BSA. Suitable foraging habitat is limited within the BSA.
southwestern willow flycatcher	*Empidonax traillii extimus*	US: FE CA: CE	Occurs in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes and reservoirs.	HA	There are no known occurrences in the vicinity of the BSA, and suitable nesting habitat does not occur within the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
California horned lark	*Eremophila alpestris actia*	US: - CA: CSA	Occurs in open grasslands, farmlands, prairies, airports, beaches, golf courses, cemeteries, and parks.	HP	There are no known occurrences in the vicinity of the BSA, but some open areas within the BSA are considered marginally suitable habitat for this species.
American peregrine falcon	*Falco peregrinus anatum*	US: FD CA: CFP	Occurs in open habitats, usually near water. Generally requires cliffs, very tall buildings, or similar situations for nesting.	HA	There is a nonspecific occurrence record in the general Project Vicinity (CNDDB 2015); however, suitable nesting habitat is absent from the BSA. Suitable foraging habitat is limited within the BSA.
yellow-breasted chat	*Icteria virens*	US: - CA: SSC	Summer breeding resident usually found in dense riparian thickets, bramble bushes, clearcuts, powerline corridors, and shrubs along streams.	HA	There are no known occurrences in the vicinity of the BSA and suitable habitat does not occur within the BSA.
California black rail	*Laterallus jamaicensis coturniculus*	US: - CA: CT, CFP	Nests in tidal salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	HA	There is one historical (nonspecific) occurrence record of a migrating individual in the general Project Vicinity (CNDDB 1896); however, there are no recent occurrence records, and suitable nesting habitat is absent from the BSA.
osprey	*Pandion haliaetus*	US: - CA: CSA	Occurs near sources of shallow, fish-filled water, including rivers, lakes, reservoirs, lagoons, swamps, and marshes.	HA	There are no known occurrences in the general vicinity of the BSA, and suitable habitat is largely absent from the BSA.
Belding's savannah sparrow	*Passerculus sandwichensis beldingii*	US: - CA: CE	Found in open areas with low vegetation, including most of northern North America from tundra to grassland, marsh, and farmland.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
coastal California gnatcatcher	*Polioptila californica*	US: FT CA: SSC	Obligate, permanent resident of coastal sage scrub habitats below 2,500 feet in elevation in southern California.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
light-footed Ridgway's rail	*Rallus longirostris levipes*	US: FE CA: CE, CFP	Occurs in select coastal marsh habitats in Southern California.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
bank swallow	*Riparia*	US: - CA: CT	Occurs in low areas along rivers, streams, ocean coasts, or reservoirs. Nesting colonies require tall vertical cliffs, bluffs, or similar situations such as sand/gravel quarries or road cuts.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
black skimmer	*Rynchops niger*	US: - CA: SSC	Occurs on open sandy beaches, gravel or shell bars with sparse vegetation, or along the margins of saltmarsh habitats. Occasionally found at inland lakes such as the Salton Sea.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
yellow warbler	*Setophaga petechia*	US: - CA: SSC	Requires habitats with riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests. Frequently found nesting and foraging in willow shrubs and thickets and in other riparian plants, including cottonwoods.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
California least tern	*Sternula antillarum browni*	US: FE CA: CE, CFP	Nests on beaches, mudflats, and sand dunes, usually near shallow estuaries and lagoons with access to the near open ocean. In southern California, known breeding habitats include Seal Beach, San Pedro Bay, Camp Pendleton, and Ballona Creek.	HA	There are no known occurrences in the vicinity of the BSA, and suitable habitat does not occur within the BSA.
least Bell's vireo (nesting)	*Vireo bellii pusillus*	US: FE CA: CE	Occurs in moist thickets and riparian areas that are predominantly composed of willow and mulefat.	HA	There are no known occurrences in the vicinity of the BSA, and suitable nesting habitat does not occur within the BSA.
MAMMALS					
pallid bat	*Antrozous pallidus*	US: - CA: SSC	Varied habitats including grasslands, shrublands, woodlands, deserts, and forest. Primarily day roosts in bridges, hollows or crevices of trees, or buildings. Occasionally roosts in mines, caves, and cliff/rock crevices.	HP	Known to frequently roost in bridges. Foraging habitat is present along the Santa Ana River in the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
Mexican long-tongued bat	*Choeronycteris mexicana*	US: - CA: SSC	In California, occasionally found in San Diego County. Feeds on nectar and pollen of night-blooming succulents. Roosts in relatively well-lit caves as well as in and around buildings.	HA	There are no known occurrences in the vicinity of the BSA, and the species is not known in California outside of San Diego County.
western mastiff bat	*Eumops perotis californicus*	US: - CA: SSC	Inhabits many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, and chaparral communities. Roosts in crevices in cliff faces, high buildings, trees, and tunnels.	HP	There is a historical (nonspecific) occurrence record in the general vicinity of the BSA (CNDDB 1949). Although only marginally suitable roosting habitat is present in the Fairview Street bridge, some suitable foraging habitat is present in the BSA, and this species is known to forage over large distances from roost sites.
silver-haired bat	*Lasionycteris noctivagans*	US: - CA: CSA	Most commonly found in boreal or coniferous and deciduous forest near bodies of water, such as rivers, lakes, streams, estuaries or ponds. Forages over streams, ponds, and open brushy areas. Roosts in hollow trees beneath exfoliating bark, abandoned woodpecker holes, and rarely under rocks. Needs drinking water.	HA	There are no known occurrences in the general vicinity of the BSA, and suitable tree roosting habitat is largely absent from the BSA.
hoary bat	*Lasiurus cinereus*	US: - CA: CSA	Prefers open habitats or habitat mosaics with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	HP	There are no known occurrences in the general vicinity of the BSA, but some suitable roosting habitat (mature trees) is present in the BSA. Foraging habitat is present along the Santa Ana River.
western yellow bat	*Lasiurus xanthinus*	US: – CA: SSC	Occurs in southern California in palm oases and in residential areas with untrimmed palm trees. Roosts primarily in trees, especially the dead fronds of palm trees. Forages over water and among trees.	HP	There are no known occurrences in the general vicinity of the BSA, but some suitable roosting habitat (palm trees) is present in the BSA. Foraging habitat is present along the Santa Ana River.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	US: – CA: SSC	Occurs in a variety of habitats including open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub communities.	HA	Not expected. There are no known occurrences in the general vicinity of the BSA, and suitable habitat is largely absent from the BSA.
south coast marsh vole	*Microtus californicus stephensi*	US: – CA: SSC	Inhabits tidal marsh habitats along coastal southern California.	HA	Not expected. There are no known occurrences in the general vicinity of the BSA, and suitable habitat does not occur within the BSA.
Yuma myotis	*Myotis yumanensis*	US: - CA: CSA	Common and widespread in California. Found in a wide variety of habitats in elevations ranging from sea level to 11,000 feet. Optimal habitats are open forests and woodlands with sources of water over which to feed.	HP	While not directly observed, suitable roosting habitat is present (Fairview Street bridge hinges/crevices) and guano consistent with that from this species was observed under the bridge.
pocketed free-tailed bat	*Nyctinomops femorasacca*	US: – CA: SSC	Spotty distribution in California, ranging from Southern California south to the Baja Peninsula, and through southwestern Arizona to at least central Mexico. In California, typically found in rocky, desert areas with relatively high cliffs.	HP	The species is very rare in Orange County, and the BSA is near the northern limit of the species' known range. Some foraging habitat is present along the Santa Ana River, and this species is known to forage over large distances from roost sites. Roosting in BSA not expected.
big free-tailed bat	*Nyctinomops macrotis*	US: – CA: SSC	Inhabits low-lying arid areas in Southern California. Needs high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	HP	The species is very rare in Orange County, and the BSA is near the northwestern limit of the species' known range. Some foraging habitat is present along the Santa Ana River, and this species is known to forage over large distances from roost sites. Roosting in BSA not expected.
pacific pocket mouse	*Perognathus longimembris pacificus*	US: FE CA: CE	Inhabits friable soils along the narrow coastal plains from the northern Mexican border to Los Angeles County.	HA	Not expected. There are no known occurrences in the general vicinity of the BSA, and suitable habitat is largely absent from the BSA.

Table 2b: Listed, Proposed, and Special-Status Animal Species Potentially Occurring or Known to Occur in the Vicinity of the BSA

Common Name	Scientific Name	Status Listing	General Habitat Description	Habitat Present/Absent	Rationale
Southern California saltmarsh shrew	*Sorex ornatus salicornicus*	US: - CA: SSC	Occurs in select salt marsh and coastal wetland habitats.	HA	Not expected. There are no known occurrences in the general vicinity of the BSA, and suitable habitat does not occur within the BSA.
American badger	*Taxidea taxus*	US: - CA: SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	HA	Not expected. There are no known occurrences in the general vicinity of the BSA, and suitable habitat does not occur within the BSA.
FISHES					
Santa Ana sucker	*Catostomus santaanae*	US: FT CA: -	Found in select shallow streams with sand, gravel or cobble bottoms. Known only from the Los Angeles, San Gabriel, and upper Santa Ana River Basins in Southern California.	HA	Not expected. There are no known occurrences in the general vicinity of the BSA, and suitable habitat does not occur within the BSA. Considered extirpated from the Santa Ana River within the BSA.
Southern California steelhead (Distinct Population Segment)	*Oncorhynchus mykiss irideus*	US: FE CA: CSA	Federal listing refers to naturally spawned anadromous *O. mykiss* (steelhead) originating below natural and man-made impassable barriers from the Santa Maria River to the U.S.-Mexico Border.	HA	Considered extirpated from the Santa Ana River within the BSA due to modifications for flood control purposes (e.g., concrete lining).

Status:
- CE = California Endangered
- CFP = California Fully Protected Species
- CSA = California Special Animal
- CSP = California Special Plant
- CT = California Threatened
- FC = Federal Candidate
- FD = Federal Delisted
- FE = Federal Endangered
- FP, FPE, FPT = Federal Proposed
- FT = Federal Threatened
- SSC = California Species of Special Concern

Abbreviation/Acronym Definitions:
- BSA = Biological Study Area
- CA = California
- CSS = coastal sage scrub
- HA = Habitat Absent
- HP = Habitat Present
- US = United States

Day- and night-roosting habitats for several special-status bat species are present within the Fairview Street bridge over the Santa Ana River. Although no bats were observed day roosting within the structure during the daytime habitat assessment, roosting activity was confirmed by the presence of guano beneath the hinge crevices.

Because the bat habitat suitability assessment was performed outside of the bat maternity season, and given the suitability of the crevice habitat observed at this structure for maternity roosting, a follow-up nighttime survey will need to be performed at this location during the summer months (i.e., June–August) in order to confirm whether this structure serves as a maternity roost and to determine the numbers and species of any bats roosting there. No additional studies are required for the Project.

4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Habitats and Natural Communities of Special Concern

Habitats are considered to be of special concern based on: (1) federal, State, and/or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals.

There are no habitats or natural communities of concern within or immediately adjacent to the BSA. The BSA is composed entirely of developed areas, with some ornamental and weedy vegetation. The BSA has low biological value to native plant and wildlife species.

4.1.1. Discussion of Jurisdictional Waters

Section 404 of the CWA and Section 1602 of the California Fish and Game Code regulate activities affecting resources under the jurisdiction of the USACE and the CDFW, respectively. "Waters of the U.S." under the jurisdiction of the USACE include navigable coastal and inland waters, lakes, rivers, and streams and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce.

The BSA contains one jurisdictional drainage feature (the Santa Ana River), as discussed in further detail in the corresponding *Jurisdictional Delineation Report* (Appendix D).

4.1.1.1. Survey Results

The Santa Ana River within the BSA is an unvegetated, concrete-lined intermittent drainage feature. This channel conveys flows attributed to local urban runoff and seasonal storm water. The low-flow channel located within the center of the channel bed had standing water at the time of the field survey. The Santa Ana River has an OHWM determined to be 21 ft up from the channel bed. Downstream of the BSA, the channel has a direct nexus to the Pacific Ocean (a navigable water of the U.S.) and is tidally influenced at its mouth. However, the tidal influence does not extend to the BSA, and there are no waters subject to jurisdiction under Section 10 of the Rivers and Harbors Act. There are no wetlands or riparian areas present within the BSA. The total acreage of potential non-wetland USACE jurisdiction within the BSA is 4.18 ac.

Because there is no current publicly issued guidance on determining RWQCB jurisdictional areas, jurisdiction was determined based on the federal definition of waters of the U.S. as recommended by the State Water Resources Control Board's *Workplan: Filling the Gaps in Wetland Protection* (2004). RWQCB jurisdiction is considered coincident with USACE jurisdiction (4.18 ac) for purposes of CWA Section 401 certification.

Under California Fish and Game Code Section 1602, the CDFW takes jurisdiction over rivers, streams, and lakes. The State's jurisdiction generally includes the streambed/lakebed to top of bank and to the outer edge of associated riparian vegetation, where present. Within the BSA, California Fish and Game Code aquatic resources extend beyond the OHWM to the top of bank within the trapezoidal portions of the Santa Ana River. There is no associated riparian vegetation within the BSA. The total acreage of potential CDFW streambed jurisdiction within the BSA is 5.55 ac.

4.1.1.2. Project Impacts

The Project involves replacing the existing Fairview Street bridge with a wider roadway bridge. As shown on Figure 3, eight existing pier walls within the river banks (totaling approximately 0.09 ac) would be replaced with four new pier walls (totaling approximately 0.05 ac) within delineated USACE/RWQCB and CDFW non-wetland aquatic resources. The total proposed permanent fill is 0.05 ac for USACE/ RWQCB- and CDFW-delineated aquatic resources. Since the proposed support structures are smaller in area than the existing support structures, a net increase in channel capacity/waters of the U.S. would occur under the Project.

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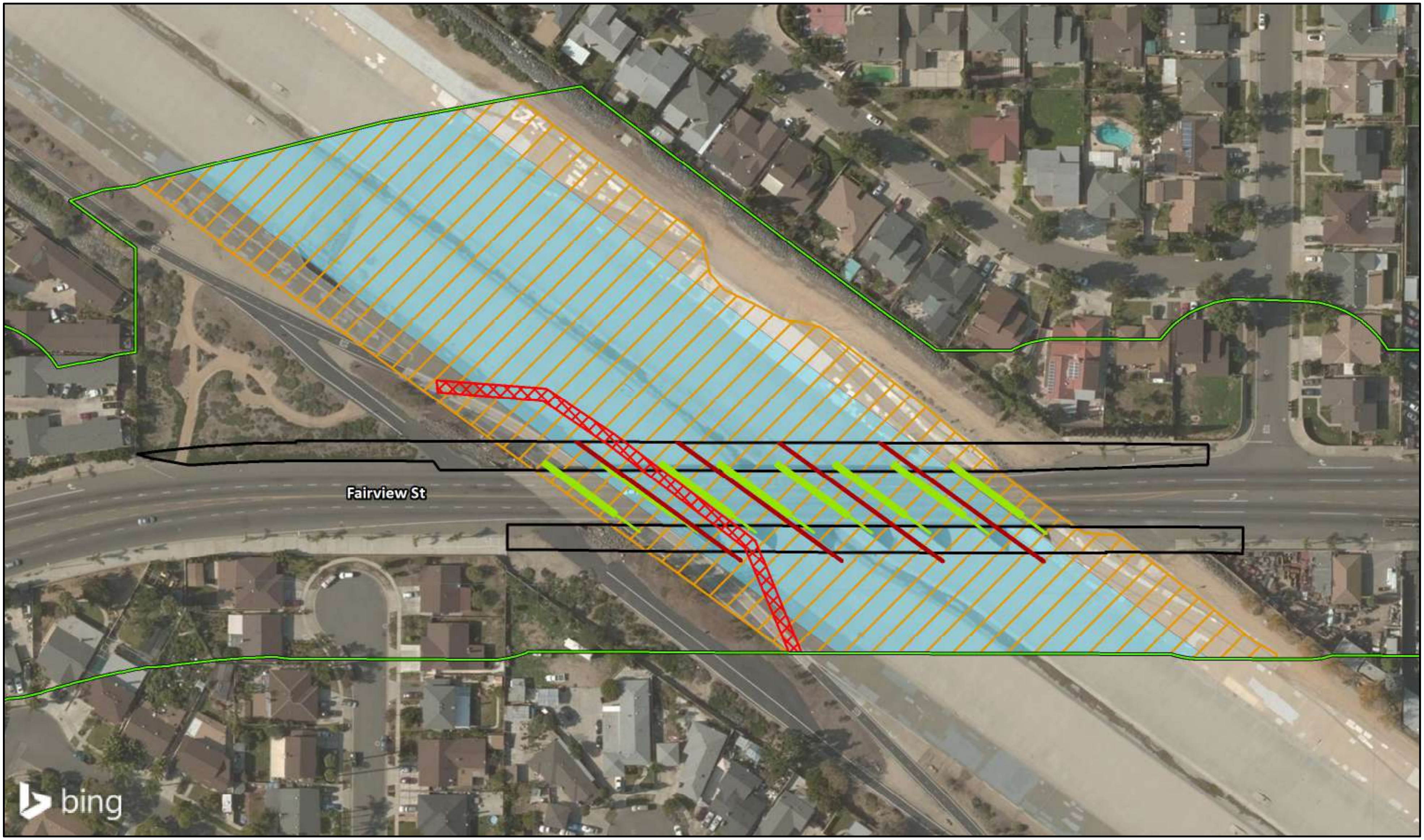

LEGEND

- Biological Study Area (BSA)
- Existing Pier Walls (0.09 acres total)
- Proposed Pier Walls (0.05 acres total)
- Potential Detour in River
  Note: Potential bike detour footprint is approximate.
- Proposed Roadway Widening

Jurisdictional Delineation Limits

- Corps (4.18 acres)
- CDFW (5.55 acres)

0 68.75 137.5
FEET

SOURCE: Bing (2016)

FIGURE 3

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Aquatic Resources

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Specifically, there would be a net decrease of 0.0175 ac of permanent fill within delineated waters of the U.S., and a net decrease of 0.04 ac of permanent fill within delineated CDFW aquatic resources.

As shown on Figure 3, a potential temporary bike detour route would be constructed within the Santa Ana River channel. This potential detour route would be constructed and deconstructed during dry-season work within the channel. The detour route would have a dirt base with an asphalt surface, and would be entirely removed following construction of the Project. Impacts associated with the potential bike detour route shown on Figure 3 would amount to 0.11 ac of temporary fill within delineated waters of the U.S. and 0.13 ac of temporary fill within delineated CDFW aquatic resources. In addition, temporary fills associated with dewatering activities and/or materials staging within the BSA will likely be required to complete the bridge removal and replacement. Such temporary fills would not permanently reduce channel capacity or result in the loss of aquatic resources. Indirect effects such as dust and construction-related runoff are also possible, but such impacts would be effectively avoided or minimized by implementing standard Best Management Practices (BMPs) during construction.

Since work would be occurring within jurisdictional aquatic resources, resource agency permits (USACE Section 404 Nationwide Permit authorization, CDFW Section 1602 Streambed Alteration Agreement, and RWQCB Section 401 Water Quality Certification) will likely be required for the Project. In addition, the Santa Ana River is a USACE facility under Section 14 ("Section 408") of the Rivers and Harbors Act of 1899, so Section 408 permission will also be required for the Project.

4.1.1.3. AVOIDANCE AND MINIMIZATION EFFORTS/COMPENSATORY MITIGATION

No compensatory mitigation is required because the Project would not adversely impact any jurisdictional wetlands, riparian areas, or waters of the U.S. A net increase of channel capacity/waters of the U.S. would occur with implementation of the Project. The Project would require compliance with all measures contained in any applicable USACE, RWQCB, and/or CDFW permit.

In order to avoid impacts to aquatic resources within the Santa Ana River and adjacent habitat areas, standard BMPs will be implemented to prevent loose soil or pollutants associated with the Project from inadvertently entering the channel, as detailed in

Measure BIO-1 below. Implementation of Measure BIO-1 will also prevent the spread of invasive plant species that could degrade aquatic habitat areas.

BIO-1 **Best Management Practices (BMPs) During Construction.**
All equipment maintenance, staging, and dispensing of fuel, oil, or any other such activities will occur in designated upland areas. The designated upland areas will be located in such a manner as to prevent any spill runoff from entering waters of the United States and other jurisdictional waters. Silt fencing and straw wattle will be placed in such a manner that they are able to catch or filter sediment or other construction-related debris to prevent it from entering aquatic areas, where necessary. All construction-related debris and trashed will be disposed of or secured to prevent any such waste from entering aquatic areas.

In order to prevent the spread of invasive species (EO 13112), any plants removed or soil disturbed during the course of construction should be contained and properly disposed off site. All mulch, topsoil, seed mixes, or other plantings used during landscaping activities and any erosion-control BMPs implemented will be free of invasive plant species seeds or propagules. No vegetation listed on the Cal-IPC inventory will be installed on the Project, and all plant palettes proposed for the Project will be reviewed by a Qualified Biologist during the Plans, Specifications, and Estimate (PS&E) phase.

4.1.2. Special-Status Plant Species

The plant species listed in Table 2a are considered to be of special concern based on: (1) federal, State, or local laws regulating impacts to them; (2) limited distributions; and/or (3) the presence of habitat required by the special-status plants occurring in the vicinity of the BSA. One plant species (Ventura marsh milk-vetch), which is federally and State-listed as endangered, was identified by the USFWS as potentially occurring within the vicinity of the BSA. The CNDDB indicated three additional special-status plant species (Gambel’s water cress, salt spring checkerbloom, and chaparral sand-verbena) with historical occurrences within 3 mi of the BSA. However, all of these historical occurrences are presumed extirpated, and no suitable habitat for these plant species occurs within the BSA.

4.1.2.1. SURVEY RESULTS

No special-status plant species were observed or are expected to occur within the BSA due to a lack of suitable habitat. A list of plant species observed in the BSA during the surveys is included in Appendix B.

4.1.2.2. PROJECT IMPACTS

The Project is not expected to affect any special-status plant species because they are considered absent from the BSA.

4.1.2.3. AVOIDANCE AND MINIMIZATION EFFORTS/COMPENSATORY MITIGATION

No compensatory mitigation or minimization measures are warranted because special-status plant species are considered absent from the BSA.

4.1.3. Special-Status Animal Species Occurrences

The animal species listed in Table 2b are considered to be of special concern based on: (1) federal, State, or local laws regulating impacts to them; (2) limited distributions; and/or (3) the habitat requirements of special-status animals occurring in the vicinity of the site. The coastal California gnatcatcher is the only listed species identified by the USFWS as potentially occurring within the vicinity of the BSA (USFWS 2018b). However, there are no known occurrences of this species within the BSA or immediate vicinity, and suitable habitat for the species is absent from the BSA. The CNDDB indicated six additional special-status wildlife species (coast horned lizard, Crotch bumble bee, western yellow-billed cuckoo, California black rail, American peregrine falcon, and western mastiff bat) with historical occurrences within 3 mi of the BSA. However, most of these historical occurrences are presumed extirpated and, with the exception of marginally suitable habitat for western mastiff bat, suitable habitat for these wildlife species is absent from the BSA.

The BSA contains suitable habitat for two non-listed, special-status avian species identified in the CNDDB records search (Cooper's hawk and California horned lark). The existing Fairview Street bridge also contains suitable roosting habitat for several non-listed, special-status bat species, and foraging habitat for these bat species is present within the BSA along the Santa Ana River. Each of these species are discussed in further detail below.

4.1.4. Discussion of Cooper's Hawk

Cooper's hawk is a medium-sized raptor that occurs in wooded areas and is frequently encountered in urban areas with mature trees and open foraging areas such as parks. It is a California Special Animal, which is an administrative designation made by the CDFW and carries no formal legal status. However, Section 15380 of the CEQA Guidelines indicates that these species should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein. The species is fairly common within the vicinity of the BSA and urban areas that contain large trees and open fields. Several mature ornamental trees located along the streets and residential areas within the BSA serve as potentially suitable nesting habitat for this species.

4.1.4.1. Survey Results

Cooper's hawk is the only special-status animal species observed within the BSA during the field surveys. An individual Cooper's hawk was observed flying over the BSA and perching on several large trees during the survey conducted on February 20, 2018. No evidence of nesting by this species was observed in the BSA during the surveys, and mature trees are limited in number within the BSA.

4.1.4.2. Project Impacts

The Project is not expected to directly or adversely impact Cooper's hawk because potentially suitable nesting habitat is limited in the BSA, and the removal of ornamental vegetation along North Fairview Street would not impact suitable nesting habitat for this species.

4.1.4.3. Avoidance and Minimization Efforts/Compensatory Mitigation

Impacts to Cooper's hawk and other nesting birds protected under the California Fish and Game Code will be avoided with implementation of Measure BIO-2, as detailed below.

BIO-2 **Nesting Bird Surveys and Avoidance.** If vegetation removal, construction, or grading activities are planned to occur within the nesting bird season (February 1 to September 30), a qualified biologist shall conduct a preconstruction nesting bird survey no more than three (3) days prior to the start of such activities. The nesting bird survey shall include the project site and areas immediately adjacent to the site that could potentially be affected by project-related activities such as noise, vibration, increased human activity, and dust, etc. For any active nest(s) identified, the qualified biologist shall establish an appropriate buffer zone around the active nest(s). The appropriate buffer shall be determined by the qualified biologist based on species, location, and the nature of the proposed activities. Project activities shall be avoided within the buffer zone until the nest is deemed no longer active by the qualified biologist.

4.1.5. Discussion of California Horned Lark

The California horned lark is a small songbird that is known to occur within the vicinity of the BSA. It is a subspecies of horned lark (*Eremophila alpestris*) and is considered a California Special Animal, which is an administrative designation made by the CDFW and carries no formal legal status. However, Section 15380 of the CEQA Guidelines indicates that these species should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein. The subspecies utilizes open grasslands and fields and prefers bare ground for nesting. Several disturbed or barren areas in the BSA provide potentially suitable habitat for this subspecies, but it is considered marginal because of the proximity to busy urban streets and associated anthropogenic disturbances.

4.1.5.1. SURVEY RESULTS

The field survey was conducted during the breeding season, and no California horned larks were observed in or near the BSA.

4.1.5.2. PROJECT IMPACTS

The Project is not expected to impact the California horned lark because it has a low probability of occurrence in the BSA.

4.1.5.3. AVOIDANCE AND MINIMIZATION EFFORTS/COMPENSATORY MITIGATION

During the breeding season, the California horned lark is the only subspecies of horned lark in non-desert Southern California; however, from September through April or early May, other subspecies visit the area. Impacts to the California horned lark will be avoided with implementation of Measure BIO-2.

4.1.6. Discussion of Special-Status Bat Species

As shown in Table 2b, the BSA contains potentially suitable habitat for seven special-status bat species. Two of these species are considered California Special Animals

(Yuma myotis and hoary bat), and the remaining five bat species are California Species of Special Concern (pallid bat, western mastiff bat, western yellow bat, pocketed free-tail bat, and big free-tail bat). "Species of Special Concern" is an administrative designation from the CDFW and carries no formal legal status. However, all bat species (regardless of listing status) and other nongame mammals are protected by California Fish and Game Code Section 4150, which states that all nongame mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by the California Fish and Game Commission. Activities resulting in the mortality of nongame mammals (e.g., destruction of an occupied bat roost, resulting in the death of bats) or disturbance that results in the loss of a maternity colony of bats (including the death of young) may be considered a “take” by the CDFW. Furthermore, any structure occupied by a bat maternity colony of any species is considered a native wildlife nursery site that is essential to the viability of local populations.

Many bats use crevices or hollow cavities in bridges and culverts as day roosts and/or the open spaces between bridge beams or girders for night roosting. Bat species that commonly use human-made structures for day and/or night roosting include pallid bat and Yuma myotis. Other species that may use these types of roosts occasionally include western mastiff bat, pocketed free-tail bat, and big free-tail bat, although pocketed free-tail bat and big free-tail bat are more commonly found in rocky desert areas and are considered rare in California. Bats may also roost in trees situated in the vicinity of human-made structures. Although bat roosts in structures can be relatively easy to identify, tree roosts are more cryptic and require close examination. Some species of bats (e.g., western yellow bat and hoary bat) day roost in the foliage of trees. Other bat species (e.g., pallid bat) commonly day roost in crevices or cavities found in mature trees and snags.

Within the BSA, suitable bat roosting habitat is present within the existing Fairview Street bridge, and suitable foraging habitat is present along the Santa Ana River.

4.1.6.1. SURVEY RESULTS

The Fairview Street bridge over the Santa Ana River is a concrete tee beam bridge. This type of bridge contains structural elements that are suitable for and commonly used by both day- and night-roosting bats. Crevice habitat suitable for day-roosting bats (including maternity colonies) is present in the two hinges and in portions of a longitudinal joint near the middle of the structure, while night-roosting habitat is present throughout the bridge structure in the spaces between the concrete girders (refer to Appendix C, Representative Site Photos). These girders form cavities in the underside of the bridge deck that trap warm air and offer shelter from the wind. Cliff swallow (*Petrochelidon pyrrhonota*) mud nests were also present throughout the girders of the bridge at the time of the assessment. The swallow mud nests may also provide day-roosting habitat for bat species, including Yuma myotis and Mexican free-tailed bats, which have been documented day roosting in swallow mud nests and may use the mud nests observed on the bridge structure.

Although the Santa Ana River is unvegetated and concrete lined in the vicinity of the Fairview Street bridge, water within the channel as well as ornamental vegetation associated with nearby residences provides foraging habitat for a variety of bat species, thereby increasing the likelihood that this structure is used for roosting.

No bats were observed during the daytime habitat assessment or the nighttime emergence survey; however, some scattered guano was observed beneath the hinges, confirming the use of these crevices by individual bats.

A concrete double-box culvert is situated within 300 ft of the Fairview Street bridge over the Santa Ana River. This culvert structure was not entered during the assessment because the entrances to each box were partially gated and because there were indications of human habitation, both of which presented potential safety considerations as well as reducing the likelihood that roosting bats were present.

4.1.6.2. PROJECT IMPACTS

Since the existing Fairview Street bridge over the Santa Ana River will be demolished for the Project, potential direct and indirect impacts to roosting bats may occur. However, there is no evidence of maternity colonies roosting within the BSA. As long as the avoidance and minimization efforts discussed below are implemented, the Project is not expected to adversely impact protected bat species. The new Fairview Street bridge to be constructed under the Project may provide additional roosting habitat for protected bat species.

4.1.6.3. AVOIDANCE AND MINIMIZATION EFFORTS/COMPENSATORY MITIGATION

The following measures will be implemented to minimize the potential for take of individual roosting bats and impacts to suitable day- and night-roosting bat habitat within the Fairview Street bridge over the Santa Ana River:

BIO-3 **Bat Eviction/Exclusion.** To avoid direct mortality of individual bats, humane evictions (if bats are present) and exclusions of roosting bats should be performed under the supervision of a CDFW-approved bat biologist prior to bridge demolition activities. Eviction/exclusion activities should be performed in the fall (September or October) prior to bridge demolition. Exclusion activities may be implemented in one or two phases at the discretion of the qualified bat biologist and in coordination with the Project Design Team.

BIO-4 **Alternative Bat Roosting Habitat.** Alternate bat roosting habitat should be incorporated into the design of the new bridge to replace crevice habitat lost from removal of the existing Fairview Street bridge over the Santa Ana River. The specifications for this replacement habitat should be designed in consultation with a qualified bat biologist.

In addition, to avoid potential impacts to bats day roosting in the swallow mud nests at the Fairview Street bridge over the Santa Ana River, the following measure will be implemented:

BIO-5 **Swallow Nest Removal.** If swallow nests are removed to prevent swallows from nesting within the Project Area during construction activities, they should be removed in the fall (i.e., September or October) prior to expected or potential overwintering use by bats, and in a manner that ensures they do not fall to the ground or are otherwise destroyed unless absence of bats is confirmed through inspection by a qualified bat biologist.

To minimize any potential indirect impacts to bats foraging and night roosting at the Fairview Street bridge over the Santa Ana River, the following measures will be implemented:

BIO-6 **Nighttime Lighting During Construction.** To minimize temporary indirect impacts during nighttime work for Project construction within 200 ft of the bridge structures, night lighting shall be used only in the area actively being worked on and focused on the direct area of work, and airspace access to and from the roost features of a structure shall not be obstructed except in direct work areas.

BIO-7 **New Bridge Lighting.** To avoid permanent indirect impacts to roosting and foraging bats, bridge lighting on the new bridge shall be designed and installed in such a way that light overspill into the Santa Ana River and beneath the bridge are limited to the greatest extent practicable.

Since the Project will not affect the culverts and any potential impacts to bats will be avoided by implementing the measures above, no compensatory mitigation is expected to be required.

5. Conclusions and Regulatory Determination

5.1. Federal Endangered Species Act Consultation Summary

An IPAC Trust Resources List was obtained from the USFWS on February 15, 2018, and is provided in Appendix A. A *No Effect* determination has been made for the FESA-listed species identified during the literature review due to the lack of suitable habitats for these species within the BSA. Therefore, no further consultation with the USFWS is anticipated to be required.

5.2. California Endangered Species Act Consultation Summary

The proposed Project is expected to have no impact on CESA-listed species. Therefore, no CESA consultation with the CDFW should be required.

5.3. Essential Fish Habitat Consultation Summary

An official Endangered Species Act Species List was obtained from NOAA Fisheries on March 16, 2018, and is provided in Appendix A. No Essential Fish Habitat is present in the BSA, and a *No Effect* determination has been made for the FESA-listed species identified during the literature review; therefore, no further consultation with NOAA Fisheries is anticipated to be required.

5.4. Wetlands and Other Waters Coordination Summary

The Project involves replacing the existing Fairview Street bridge over the Santa Ana River with a wider roadway bridge. As shown on Figure 3, eight existing pier walls (totaling approximately 0.09 ac) would be replaced with four new pier walls, for a total of 0.05 ac of new permanent fill within delineated USACE/RWQCB and CDFW nonwetland aquatic resources. Since the proposed bridge support structures are smaller in area than the existing support structures, a net increase in channel capacity/waters of the U.S. would occur under the Project. During construction, temporary fill would be placed within the Santa Ana River channel associated with a potential bike detour route, materials staging and access, and/or dewatering. Such temporary fills would not permanently reduce channel capacity or result in the loss of aquatic resources.

Since work would be occurring within nonwetland jurisdictional aquatic resources associated with the Santa Ana River, resource agency permits (USACE Section 404 Nationwide Permit authorization, CDFW Section 1602 Streambed Alteration Agreement, and RWQCB Section 401 Water Quality Certification) are anticipated to be required for the Project. In addition, the Santa Ana River is a USACE facility under Section 14 ("Section 408") of the Rivers and Harbors Act of 1899, so Section 408 permission will also be required for the Project.

5.5. Nesting Birds

The BSA contains mature ornamental trees and other areas, including the culverts where inactive cliff swallow nests were found, which could provide nesting habitat for native birds. To avoid potential impacts to nesting birds that are protected under the California Fish and Game Code and the MBTA, it is recommended that any necessary vegetation removal be performed outside the bird nesting season (February 1–September 30). If vegetation removal cannot be performed outside the bird nesting season or if construction is scheduled to begin during the nesting season, Measure BIO-2 (refer to Section 4.1.4.3.) will be implemented to avoid adverse impacts to nesting birds.

5.6. Invasive Species

A majority of the plants observed (Appendix B) within the BSA are classified as Invasive Species and listed on the California Invasive Plant Council (Cal-IPC) Inventory Database. Measure BIO-1 (refer to Section 4.1.1.3) contains provisions that will be implemented to prevent the spread of exotic plant species. With implementation of Measure BIO-1, the Project is not expected to disperse exotic plant species seeds or otherwise contribute to the invasion of exotic species into natural habitats.

6. References

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Appendix A CNDDB, CNPS, USFWS, and NOAA Fisheries Species Lists

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Anaheim (3311778) OR Whittier (3311881) OR La Habra (3311788) OR Yorba Linda (3311787) OR Los Alamitos (3311871) OR Orange (3311777) OR Seal Beach (3311861) OR Newport Beach (3311768) OR Tustin (3311767))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia villosa var. aurita chaparral sand-verbena	PDNYC010P1	None	None	G5T2?	S2	1B.1
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
Aimophila ruficeps canescens southern California rufous-crowned sparrow	ABPBX91091	None	None	G5T3	S3	WL
Ammodramus savannarum grasshopper sparrow	ABPBXA0020	None	None	G5	S3	SSC
Anniella stebbinsi southern California legless lizard	ARACC01060	None	None	G3	S3	SSC
Aphanisma blitoides aphanisma	PDCHE02010	None	None	G3G4	S2	1B.2
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Asio otus long-eared owl	ABNSB13010	None	None	G5	S3?	SSC
Aspidoscelis hyperythra orange-throated whiptail	ARACJ02060	None	None	G5	S2S3	WL
Aspidoscelis tigris stejnegeri coastal whiptail	ARACJ02143	None	None	G5T5	S3	SSC
Astragalus pycnostachyus var. lanosissimus Ventura Marsh milk-vetch	PDFAB0F7B1	Endangered	Endangered	G2T1	S1	1B.1
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex coulteri Coulter's saltbush	PDCHE040E0	None	None	G3	S1S2	1B.2
Atriplex pacifica south coast saltscale	PDCHE041C0	None	None	G4	S2	1B.2
Atriplex parishii Parish's brittlescale	PDCHE041D0	None	None	G1G2	S1	1B.1
Atriplex serenana var. davidsonii Davidson's saltscale	PDCHE041T1	None	None	G5T1	S1	1B.2
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
Branchinecta sandiegonensis San Diego fairy shrimp	ICBRA03060	Endangered	None	G2	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Buteo regalis ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
California Walnut Woodland California Walnut Woodland	CTT71210CA	None	None	G2	S2.1	
Calochortus plummerae Plummer's mariposa-lily	PMLIL0D150	None	None	G4	S4	4.2
Calochortus weedii var. intermedius intermediate mariposa-lily	PMLIL0D1J1	None	None	G3G4T2	S2	1B.2
Calystegia felix lucky morning-glory	PDCON040P0	None	None	G1Q	S1	1B.1
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	ABPBG02095	None	None	G5T3Q	S3	SSC
Catostomus santaanae Santa Ana sucker	AFCJC02190	Threatened	None	G1	S1	
Centromadia parryi ssp. australis southern tarplant	PDAST4R0P4	None	None	G3T2	S2	1B.1
Centromadia pungens ssp. laevis smooth tarplant	PDAST4R0R4	None	None	G3G4T2	S2	1B.1
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Chelonia mydas green turtle	ARAAA02010	Threatened	None	G3	S1	
Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	PDSCR0J0C2	Endangered	Endangered	G4?T1	S1	1B.2
Choeronycteris mexicana Mexican long-tongued bat	AMACB02010	None	None	G4	S1	SSC
Cicindela gabbii western tidal-flat tiger beetle	IICOL02080	None	None	G2G4	S1	
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S2	
Cicindela latesignata latesignata western beach tiger beetle	IICOL02113	None	None	G2G4T1T2	S1	
Cicindela senilis frosti senile tiger beetle	IICOL02121	None	None	G2G3T1T3	S1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Coelus globosus globose dune beetle	IICOL4A010	None	None	G1G2	S1S2	
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Crotalus ruber red-diamond rattlesnake	ARADE02090	None	None	G4	S3	SSC
Danaus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	None	None	G4T2T3	S2S3	
Dudleya multicaulis many-stemmed dudleya	PDCRA040H0	None	None	G2	S2	1B.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Eriastrum densifolium ssp. sanctorum Santa Ana River woollystar	PDPLM03035	Endangered	Endangered	G4T1	S1	1B.1
Eryngium aristulatum var. parishii San Diego button-celery	PDAPI0Z042	Endangered	Endangered	G5T1	S1	1B.1
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3S4	SSC
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Helianthus nuttallii ssp. parishii Los Angeles sunflower	PDAST4N102	None	None	G5TH	SH	1A
Icteria virens yellow-breasted chat	ABPBX24010	None	None	G5	S3	SSC
Isocoma menziesii var. decumbens decumbent goldenbush	PDAST57091	None	None	G3G5T2T3	S2	1B.2
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G5	S3S4	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasiurus xanthinus western yellow bat	AMACC05070	None	None	G5	S3	SSC
Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1	None	None	G4T2	S2	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Lepidium virginicum var. robinsonii Robinson's pepper-grass	PDBRA1M114	None	None	G5T3	S3	4.3
Microtus californicus stephensi south coast marsh vole	AMAFF11035	None	None	G5T1T2	S1S2	SSC
Myotis yumanensis Yuma myotis	AMACC01020	None	None	G5	S4	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Nama stenocarpa mud nama	PDHYD0A0H0	None	None	G4G5	S1S2	2B.2
Nasturtium gambelii Gambel's water cress	PDBRA270V0	Endangered	Threatened	G1	S1	1B.1
Navarretia prostrata prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	G2	S2	1B.1
Nemacaulis denudata var. denudata coast woolly-heads	PDPGN0G011	None	None	G3G4T2	S2	1B.2
Nyctinomops femorosaccus pocketed free-tailed bat	AMACD04010	None	None	G4	S3	SSC
Nyctinomops macrotis big free-tailed bat	AMACD04020	None	None	G5	S3	SSC
Orcuttia californica California Orcutt grass	PMPOA4G010	Endangered	Endangered	G1	S1	1B.1
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Panoquina errans wandering (=saltmarsh) skipper	IILEP84030	None	None	G4G5	S2	
Passerculus sandwichensis beldingi Belding's savannah sparrow	ABPBX99015	None	Endangered	G5T3	S3	
Pentachaeta aurea ssp. allenii Allen's pentachaeta	PDAST6X021	None	None	G4T1	S1	1B.1
Perognathus longimembris pacificus Pacific pocket mouse	AMAFD01042	Endangered	None	G5T1	S1	SSC
Phacelia stellaris Brand's star phacelia	PDHYD0C510	None	None	G1	S1	1B.1
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Polioptila californica californica coastal California gnatcatcher	ABPBJ08081	Threatened	None	G4G5T2Q	S2	SSC
Rallus obsoletus levipes light-footed Ridgway's rail	ABNME05014	Endangered	Endangered	G5T1T2	S1	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Rynchops niger black skimmer	ABNNM14010	None	None	G5	S2	SSC
Salvadora hexalepis virgultea coast patch-nosed snake	ARADB30033	None	None	G5T4	S2S3	SSC
Senecio aphanactis chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
Setophaga petechia yellow warbler	ABPBX03010	None	None	G5	S3S4	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Sidalcea neomexicana salt spring checkerbloom	PDMAL110J0	None	None	G4	S2	2B.2
Sorex ornatus salicornicus southern California saltmarsh shrew	AMABA01104	None	None	G5T1?	S1	SSC
Southern California Arroyo Chub/Santa Ana Sucker Stream Southern California Arroyo Chub/Santa Ana Sucker Stream	CARE2330CA	None	None	GNR	SNR	
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	CTT61310CA	None	None	G4	S4	
Southern Coastal Salt Marsh Southern Coastal Salt Marsh	CTT52120CA	None	None	G2	S2.1	
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	G3	S3.2	
Southern Dune Scrub Southern Dune Scrub	CTT21330CA	None	None	G1	S1.1	
Southern Foredunes Southern Foredunes	CTT21230CA	None	None	G2	S2.1	
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	G4	S4	
Southern Willow Scrub Southern Willow Scrub	CTT63320CA	None	None	G3	S2.1	
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
Suaeda esteroa estuary seablite	PDCHE0P0D0	None	None	G3	S2	1B.2
Symphyotrichum defoliatum San Bernardino aster	PDASTE80C0	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trigonoscuta dorothea dorothea Dorothy's El Segundo Dune weevil	IICOL51021	None	None	G1T1	S1	
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	

Record Count: 100

CNPS Inventory of Rare and Endangered Plants of California 9-Quad Search Area List Generated August 8, 2018				
Scientific Name	**Common Name**	**CRPR**	**CESA**	**FESA**
Abronia villosa var. *aurita*	chaparral sand-verbena	1B.1	None	None
Aphanisma blitoides	aphanisma	1B.2	None	None
Astragalus pycnostachyus var. *lanosissimus*	Ventura marsh milk-vetch	1B.1	CE	FE
Atriplex coulteri	Coulter's saltbush	1B.2	None	None
Atriplex pacifica	South Coast saltscale	1B.2	None	None
Atriplex parishii	Parish's brittlescale	1B.1	None	None
Atriplex serenana var. *davidsonii*	Davidson's saltscale	1B.2	None	None
Calochortus weedii var. *intermedius*	intermediate mariposa lily	1B.2	None	None
Calystegia felix	lucky morning-glory	1B.1	None	None
Camissoniopsis lewisii	Lewis' evening-primrose	3	None	None
Centromadia parryi ssp. *australis*	southern tarplant	1B.1	None	None
Chloropyron maritimum ssp. *maritimum*	salt marsh bird's-beak	1B.2	CE	FE
Chorizanthe parryi var. *fernandina*	San Fernando Valley spineflower	1B.1	CE	FC
Dudleya multicaulis	many-stemmed dudleya	1B.2	None	None
Dudleya stolonifera	Laguna Beach dudleya	1B.1	CT	FT
Eryngium aristulatum var. *parishii*	San Diego button-celery	1B.1	CE	FE
Hordeum intercedens	vernal barley	3.2	None	None
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	1B.1	None	None
Nama stenocarpa	mud nama	2B.2	None	None
Nasturtium gambelii	Gambel's water cress	1B.1	CT	FE
Navarretia prostrata	prostrate vernal pool navarretia	1B.1	None	None
Nemacaulis denudata var. *denudata*	coast woolly-heads	1B.2	None	None
Orcuttia californica	California Orcutt grass	1B.1	CE	FE
Phacelia ramosissima var. *austrolitoralis*	south coast branching phacelia	3.2	None	None
Phacelia stellaris	Brand's star phacelia	1B.1	None	None
Sagittaria sanfordii	Sanford's arrowhead	1B.2	None	None
Senecio aphanactis	chaparral ragwort	2B.2	None	None
Sidalcea neomexicana	salt spring checkerbloom	2B.2	None	None
Suaeda esteroa	estuary seablite	1B.2	None	None
Symphyotrichum defoliatum	San Bernardino aster	1B.2	None	None

IPaC **U.S. Fish & Wildlife Service**

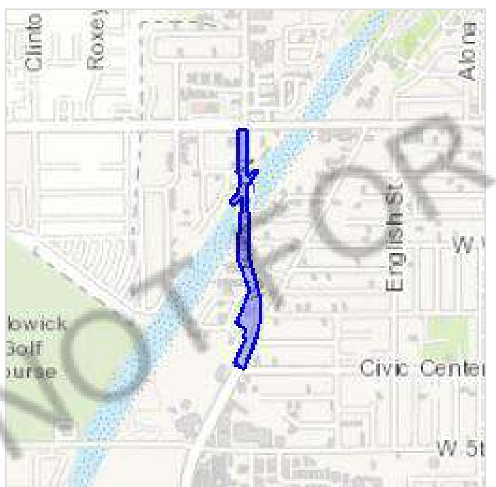
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Orange County, California



Local office

Carlsbad Fish And Wildlife Office

(760) 431-9440
(760) 431-5901

2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385

http://www.fws.gov/carlsbad/

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS

Coastal California Gnatcatcher Polioptila californica californica There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8178	Threatened

Flowering Plants

NAME	STATUS
Ventura Marsh Milk-vetch Astragalus pycnostachyus var. lanosissimus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1160	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Allen's Hummingbird Selasphorus sasin This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Black Skimmer Rynchops niger This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31

Costa's Hummingbird Calypte costae — Breeds Jan 15 to Jun 10
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9470

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Whimbrel Numenius phaeopus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ()
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

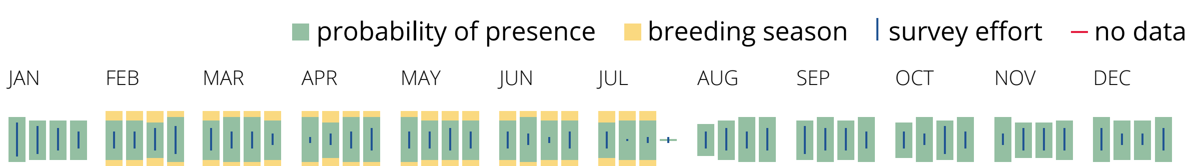
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

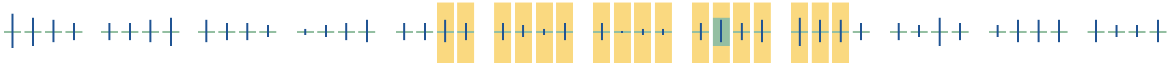
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

SPECIES

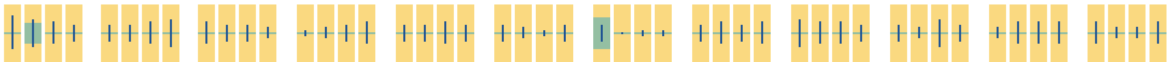


Allen's Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

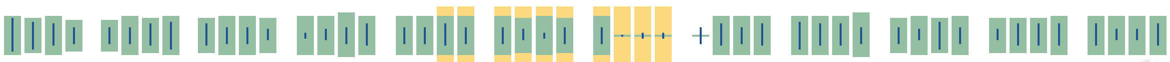
Black Skimmer
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



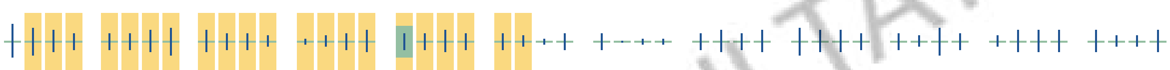
Clark's Grebe
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



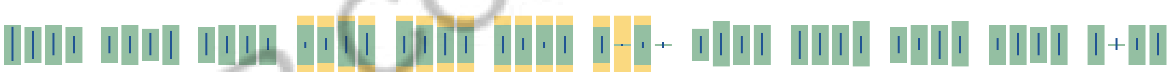
Common Yellowthroat
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Costa's Hummingbird
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

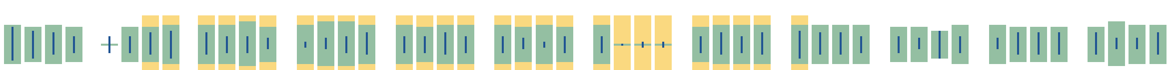


Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

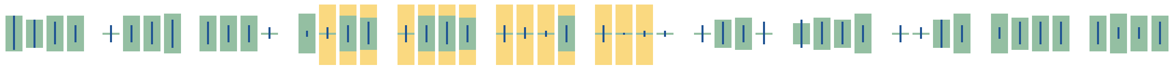


Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Song Sparrow
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

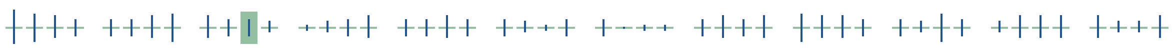


Spotted Towhee
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

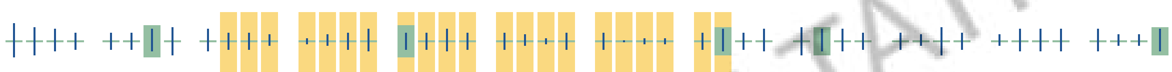


Whimbrel
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wrentit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

- R2USCr
- R2UBHr

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Bo Gould

From: NMFSWCRCA Specieslist - NOAA Service Account <nmfswcrca.specieslist+canned.response@noaa.gov>
Sent: Sunday, October 28, 2018 11:58 AM
To: Bo Gould
Subject: RE: Caltrans: Fairview Street Widening and Bridge Replacement Official Species List Request

Receipt of this message confirms that NMFS has received your email to nmfswcrca.specieslist@noaa.gov. If you are a federal agency (or representative) and have followed the steps outlined on the California Species List Tools web page (http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html), you have generated an official Endangered Species Act species list.

Messages sent to this email address are not responded to directly. For project specific questions, please contact your local NMFS office.

Northern California/Klamath (Arcata) 707-822-7201

North-Central Coast (Santa Rosa) 707-387-0737

Southern California (Long Beach) 562-980-4000

California Central Valley (Sacramento) 916-930-3600

NOAA Fisheries Species List
Generated October 28, 2018

Quad Name **Anaheim**
Quad Number **33117-G8**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) - **X**
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -

NOAA Fisheries Species List
Generated October 28, 2018

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH -
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

NOAA Fisheries Species List
Generated October 28, 2018

<u>ESA and MMPA Cetaceans/Pinnipeds</u>
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -

MMPA Pinnipeds -

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Appendix B List of Plant and Wildlife Species Observed

B.1 Vascular Plant Species Observed

The following vascular plant species were observed in the BSA by LSA biologists on February 20, 2018. Additional plant species may be present on private properties within the BSA.

* Introduced species not native to California

GYMNOSPERMS	
Cupressaceae	**Cypress Family**
* *Cupressus sempervirens*	Italian cypress
Pinaceae	**Pine Family**
* *Pinus* sp.	pine species
EUDICOTS	
Adoxaceae	**Moschatel Family**
Sambucus nigra ssp. *caerulea*	blue elderberry
Aizoaceae	**Iceplant Family**
* *Carpobrotus edulis*	hottentot-fig
* *Mesembryanthemum crystallinum*	crystalline iceplant
Apiaceae	**Carrot Family**
* *Foeniculum vulgare*	Sweet fennel
Asteraceae	**Sunflower Family**
Artemisia californica	California sagebrush
Baccharis pilularis	coyote brush
Baccharis salicifolia	mulefat
Encelia californica	California bush sunflower
Encelia farinosa	brittlebush
Erigeron canadensis	Canadian horseweed
* *Hedypnois cretica*	Crete weed
Isocoma menziesii	Menzies' goldenbush
* *Sonchus asper*	sow thistle
* *Taraxacum officinale*	common dandelion
Bignoniaceae	**Catalpa Family**
* *Jacaranda mimosifolia*	blue jacaranda

	Boraginaceae	**Borage Family**
*	*Echium candicans*	pride of madeira
	Eriodictyon crassifolium	thick leaved yerba santa
	Chenopodiaceae	**Goosefoot Family**
*	*Atriplex semibaccata*	Australian saltbush
*	*Chenopodium album*	lamb's quarters
*	*Salsola tragus*	Russian-thistle
	Crassulaceae	**Stonecrop Family**
*	*Crassula ovata*	jade plant
	Euphorbiaceae	**Spurge Family**
*	*Euphorbia maculata*	spotted spurge
	Fabaceae	**Pea Family**
*	*Acacia longifolia*	golden wattle
*	*Trifolium repens*	white clover
	Geraniaceae	**Geranium Family**
*	*Erodium cicutarium*	redstem filaree
	Lamiaceae	**Mint Family**
	Salvia apiana	white sage
*	*Salvia officinalis*	kitchen sage
	Lythraceae	**Loosestrife Family**
*	*Lagerstroemia indica*	crape myrtle
	Malvaceae	**Mallow Family**
*	*Malva parviflora*	cheeseweed
	Moraceae	**Mulberry Family**
*	*Ficus benjamina*	weeping fig
	Nyctaginaceae	**Four O'clock Family**
*	*Bougainvillea spectabilis*	bougainvillea
	Oxalidaceae	**Wood Sorrel Family**
*	*Oxalis pes-caprae*	Bermuda buttercup
	Platanaceae	**Plane Tree Family**
*	*Platanus hybrida*	London plane tree
	Polygonaceae	**Buckwheat Family**
	Eriogonum fasciculatum	California buckwheat
	Rosaceae	**Rose Family**
	Heteromeles arbutifolia	toyon
	Rutaceae	**Citrus Family**
*	*Citrus* spp.	orange and lemon trees

Salicaceae	**Willow Family**
Populus fremontii	Freemont cottonwood
Salix lasiolepis	arroyo willow
Simaroubaceae	**Quassia Family**
* *Ailanthus altissima*	tree of heaven

MONOCOTS

Araceae	**Arum Family**
* *Colocasia esculenta*	taro root
Arecaceae	**Palm Family**
* *Syagrus romanzoffiana*	Queen palm
* *Washingtonia robusta*	Mexican fan palm
Poaceae	**Grass Family**
* *Cynodon dactylon*	Bermuda grass
* *Festuca myuros*	rattail fescue
* *Hordeum murinum*	foxtail barley
Muhlenbergia rigens	deergrass

Taxonomy and scientific nomenclature generally conform to Baldwin, B.G., D.H. Goldman et al., eds. (2012; The Jepson Manual: Vascular Plants of California, 2nd edition; University of California Press, Berkeley and Los Angeles, California).

Common names for each taxa generally conform to Roberts, F.M., Jr. (2008; The Vascular Plants of Orange County, California: An Annotated Checklist; F.M. Roberts Publications, San Luis Rey, California) except where Abrams, L. (1923, 1944, and 1951; Illustrated Flora of the Pacific States: Washington, Oregon, and California, vols. I–III; Stanford University Press, Stanford, California) and Abrams, L. and Ferris, R.S. (1960; Illustrated Flora of the Pacific States: Washington, Oregon, and California, vol. IV; Stanford University Press, Stanford, California) were used, particularly when species-specific common names were not identified in Roberts, F.M., Jr. (2008).

B.2 Animal Species Detected

This is a list of the wildlife species noted in the BSA by LSA biologists. Presence may be noted if a species is seen or heard, or identified by the presence of tracks, scat, or other signs.

* Species not native to California

INSECTA	**INSECTS**
Apidae	**Bees**
* *Apis mellifera*	European honey bee
Lycaenidae	**Gossamer-winged Butterflies**
Brephidium exilis	western pigmy blue
Hesperiidae	**Skippers**
Polites sabuleti	sandhill skipper
REPTILIA	**REPTILES**
Iguanidae	**Iguanas**
Sceloporus occidentalis	western fence lizard
AVES	**BIRDS**
Anatidae	**Ducks, Geese, and Swans**
Anas platyrhynchos	mallard
Columbidae	**Pigeons and Doves**
* *Columba livia*	rock pigeon
Zenaida macroura	mourning dove
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	black phoebe
Tyrannus verticalis	western kingbird
Corvidae	**Crows and Jays**
Corvus corax	common raven
Laridae	**Gulls, Terns, and Skippers**
Larus californicus	California gull
Mimidae	**Thrashers, Mockingbirds, and Tremblers**
Mimus polyglottos	northern mockingbird
Hirundinidae	**Swallows**
Petrochelidon pyrrhonota	cliff swallow

Trochilidae	**Hummingbirds**
Calypte anna	Anna’s hummingbird
Sturnidae	**Starlings**
* *Sturnus vulgaris*	European starling
Parulidae	**New World Warblers**
Setophaga coronata	yellow-rumped warbler
Fringillidae	**Fringilline and Cardueline Finches and Allies**
Haemorhous mexicanus	house finch
Passeridae	**Old World Sparrows**
* *Passer domesticus*	house sparrow
Passerellidae	**New World Sparrows**
Zonotrichia leucophrys	white-crowned sparrow
Accipitridae	**Eagles, Hawks, Kites, Old World Vultures**
Accipiter cooperii	Cooper’s hawk
Cathartidae	**New World Vultures and Condors**
Cathartes aura	turkey buzzard
MAMMALIA	**MAMMALS**
Felidae	**Cats**
* *Felis catus*	domestic cat
Geomyidae	**Pocket Gophers**
Thomomys bottae	Botta’s pocket gopher

Taxonomy and nomenclature are based primarily on the following:

- **Damselflies and Dragonflies:** Paulson, D. (2009, Dragonflies and Damselflies of the West, Princeton University Press, Princeton, New Jersey).
- **Butterflies:** North American Butterfly Association (2001, NABA Checklist and English Names of North American Butterflies, Second Edition, North American Butterfly Association, Morristown, New Jersey, 2003 update in American Butterflies 11: 24-27; see http://www.naba.org/pubs/checklst.html).
- **Amphibians and Reptiles:** Crother, B.I. ed. (2017, Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding. Eighth Edition. Herpetological Circular 43.) for species taxonomy and nomenclature; AmphibiaWeb (https://amphibiaweb.org/) and The Reptile Database

(www.reptile-database.org/) for higher order taxonomy; see also California Herps (http://www.californiaherps.com/index.html).

- **Birds:** American Ornithological Society (1998, The A.O.U. Checklist of North American Birds, Seventh Edition, American Ornithologists' Union, Washington, D.C.; and supplements; see http://checklist.aou.org/taxa).
- **Mammals:** Bradley, R. D. et al. (2014, Revised Checklist of North American Mammals North of Mexico, 2014. Museum of Texas Tech University Occasional Papers No. 327).

Appendix C Representative Site Photographs

View of the existing Fairview Street Bridge from the top of the north bank of the Santa Ana River channel, facing southwest.

View downstream of the existing Fairview Street Bridge, showing the proposed construction access route on the north side of the Santa Ana River.

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project
Representative Site Photos

Fairview Triangle Park. View facing northeast with installed native shrubs in the foreground and the existing Fairview Street Bridge over the Santa Ana River in the background.

View facing north along Fairview Street towards the bridge, with installed Menzies' goldenbush (*Isocoma menziesii*) along the edges of Fairview Triangle Park to the west.

APPENDIX C
Sheet 2 of 3

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project
Representative Site Photos

View of the existing Fairview Street Bridge from the Santa Ana River Trail to the west of the bridge, facing east.

Potentially suitable bat roosting habitat along a hinge in the existing Fairview Street Bridge.

APPENDIX C
Sheet 3 of 3

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project
Representative Site Photos

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Appendix D Jurisdictional Delineation Report

JURISDICTIONAL DELINEATION REPORT

FAIRVIEW STREET IMPROVEMENTS

FROM 9TH STREET TO 16TH STREET AND BRIDGE REPLACEMENT PROJECT

SANTA ANA, ORANGE COUNTY, CALIFORNIA

LSA

November 2018

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LIST OF ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
1987 Manual	*Corps of Engineers Wetlands Delineation Manual*
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
Corps	United States Army Corps of Engineers
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
FAC	Facultative
FACW	Facultative Wetland
ft	feet/foot
OBL	Obligate Wetland
OHWM	Ordinary High Water Mark
Porter-Cologne Act	California Porter-Cologne Water Quality Control Act
project	Fairview Street Bridge Replacement Project
Regional Supplement	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0)
RHA	Rivers and Harbors Act
RWQCB	Regional Water Quality Control Board
TNW	traditionally navigable water
USDA	United States Department of Agriculture
USGS	United States Geological Survey
waters of the U.S.	waters of the United States

INTRODUCTION

The City of Santa Ana (City), in conjunction with the California Department of Transportation, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed Project) in Santa Ana, California (see Figure 1—all figures are attached in Appendix A). The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

Within the project limits, Fairview Street is bordered by single-family residences and a few commercial properties.

This Jurisdictional Delineation Report presents a description of the delineation of aquatic resources potentially affected by the project and contains supporting information to be submitted to the appropriate resource agencies during project environmental review and permitting.

SITE DESCRIPTION

The project site is located on the United States Geological Survey (USGS) 7.5-minute *Anaheim, California*, topographical quadrangle series map. Land uses adjacent to the project include residential to the north, south, east, and west. The tops of the Santa Ana River banks are part of the Santa Ana river trail system and are used recreationally.

The Jurisdictional Delineation Limits coincide with the Biological Study Area (BSA) limits and were used to map and assess potentially jurisdictional aquatic resources that could be directly or indirectly affected by the proposed project (see Figure 2). Elevations in the Jurisdictional Delineation Limits range from approximately 80 to 95 feet (ft) above mean sea level. The topography of the Jurisdictional Delineation Limits gently slopes downhill from east to west between 17th Street and 5th Street.

The regional climate is classified as Mediterranean (i.e., arid climate with hot, dry summers and moderately mild, wet winters). The average annual precipitation is 13.6 inches. Although most of the precipitation occurs from November through March, thunderstorms may occur at other times of the year and can cause extremely high precipitation rates. On average, monthly high temperatures range between 69 degrees Fahrenheit (°F) and 85°F, and monthly low temperatures range between 46°F and 64°F.

The Jurisdictional Delineation Limits are within the Santa Ana River Watershed, which covers an area of approximately 210 square miles in Orange County. The headwaters of the entire 2,650-square-mile Santa Ana River Watershed begin in the San Bernardino Mountains and cross Riverside and Orange Counties before ultimately entering the Pacific Ocean. Flows within the Santa Ana River can be attributed to general winter storms and local storms within the Santa Ana River Watershed. Urban runoff and wastewater treatment plants also contribute to flows within the Santa Ana River.

REGULATORY BACKGROUND

UNITED STATES ARMY CORPS OF ENGINEERS

The United States Army Corps of Engineers (Corps) regulates discharges of dredged or fill material into waters of the United States (waters of the U.S.). These waters include wetland and nonwetland bodies of water that meet specific criteria. Corps regulatory jurisdiction pursuant to Section 404 of the Clean Water Act (CWA) is founded on a connection, or nexus, between the water body in question and interstate commerce. This connection may be direct, through a tributary system linking a stream channel with traditionally navigable waters (TNWs) used in interstate or foreign commerce, or may be indirect, through a nexus identified in the Corps regulations. The following definition of waters of the U.S. is from 33 Code of Federal Regulations (CFR) 328.3:

> The term waters of the United States means:
>
> (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce … ;
>
> (2) All interstate waters including interstate wetlands;
>
> (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams) … the use, degradation or destruction of which could affect interstate or foreign commerce … ;
>
> (4) All impoundments of waters otherwise defined as waters of the United States under the definition; and
>
> (5) Tributaries of waters defined in paragraphs (a) (1)–(4) of this section.

The Corps typically regulates as waters of the U.S. any body of water displaying an Ordinary High Water Mark (OHWM). Corps jurisdiction over nontidal waters of the U.S. extends laterally to the OHWM or beyond the OHWM to the limit of any adjacent wetlands, if present (33 CFR 328.4). The OHWM is defined as "… that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area" (33 CFR 328.3). Corps jurisdiction typically extends upstream to the point where the OHWM is no longer perceptible.

As discussed above, Corps regulatory jurisdiction under Section 404 of the CWA is founded on a connection between the water body in question and interstate commerce. This connection may be direct, through a tributary system linking a stream channel with TNW used in interstate or foreign commerce, or may be indirect, through a nexus identified in the Corps regulations. In the past, an indirect nexus could potentially be established if isolated waters provided habitat for migratory birds, even in the absence of a surface connection to navigable water of the U.S. The 1984 rule that enabled the Corps to expand jurisdiction over isolated waters of this type became known as the Migratory Bird Rule. On January 9, 2001, the United States Supreme Court narrowly limited the

Corps jurisdiction of "… nonnavigable, isolated, intrastate …" waters based solely on the use of such waters by migratory birds and, particularly, the use of indirect indicators of interstate commerce (e.g., use by migratory birds that cross state lines) as a basis for jurisdiction. The Supreme Court's ruling derives from the case *Solid Waste Agency of Northern Cook County vs. United States Army Corps of Engineers*, No. 99-1178. The Supreme Court determined that the Corps exceeded its statutory authority by asserting CWA jurisdiction over an abandoned sand and gravel pit in northern Illinois that provided habitat for migratory birds.

In 2006, the United States Supreme Court further considered the Corps jurisdiction of "… waters of the United States …" in the consolidated cases *Rapanos vs. United States* and *Carabell vs. United States* (126 Supreme Court 2208), collectively referred to as "*Rapanos*." The United States Supreme Court concluded that wetlands are "waters of the United States" if they significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as navigable. On June 5, 2007, the Corps issued guidance regarding the *Rapanos* decision. After consideration of public comments and agencies' experience, revised guidance was issued on December 2, 2008. This guidance states that the Corps will continue to assert jurisdiction over TNW, wetlands adjacent to TNW, relatively permanent nonnavigable tributaries that have a continuous flow at least seasonally (typically 3 months), and wetlands that directly abut relatively permanent tributaries. The Corps will determine jurisdiction over waters that are nonnavigable tributaries that are not relatively permanent and wetlands adjacent to nonnavigable tributaries that are not relatively permanent only after making a significant nexus finding. The Corps will generally not assert jurisdiction over swales or erosional features, or ditches excavated wholly in and draining only uplands that do not carry a relatively permanent flow of water. However, the Corps does reserve the right to regulate these waters on a case-by-case basis.

Furthermore, the preamble to the Corps regulations at 33 CFR Section 328.3, Definitions, states that the Corps does not generally consider the following waters to be waters of the U.S. (the Corps does, however, reserve the right to regulate these waters on a case-by-case basis):

- Nontidal drainage and irrigation ditches excavated on dry land
- Artificially irrigated areas that would revert to upland if irrigation ceased
- Artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing
- Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons
- Water-filled depressions created in dry land incidental to construction activity and pits excavated in dry land for purposes of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the U.S.

In some cases, waters found to be isolated and not subject to CWA regulation may be regulated by the Regional Water Quality Control Board (RWQCB) under the State's Porter-Cologne Water Quality Control Act (Porter-Cologne Act), as described later in this section.

WETLANDS

Wetland delineations for Section 404 purposes must be conducted according to the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (Regional Supplement) (Corps 2008) and the *Corps of Engineers Wetlands Delineation Manual* (1987 Manual) (Corps 1987). Where there are differences between the two documents, the Regional Supplement takes precedence over the 1987 Manual.

The Corps and the United States Environmental Protection Agency (EPA) define "wetlands" as follows:

> Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions.

To be considered a jurisdictional wetland under Section 404, an area must possess three wetland characteristics (three parameters): hydrophytic vegetation, hydric soils, and wetland hydrology. Each characteristic has a specific set of mandatory wetland criteria that must be satisfied for that particular wetland characteristic to be met. Several indicators may be analyzed to determine whether the criteria are satisfied.

Hydrophytic vegetation and hydric soil indicators provide evidence that episodes of inundation have lasted more than a few days or have occurred repeatedly over a period of years, but do not confirm that an episode has occurred recently. Conversely, wetland hydrology indicators provide evidence that an episode of inundation or soil saturation occurred recently, but do not provide evidence that episodes have lasted more than a few days or have occurred repeatedly over a period of years. Because of this, if an area lacks one of the three characteristics under normal conditions, the area is considered nonwetland under most circumstances.

Determination of wetland limits may be complicated by a variety of natural environmental factors or human activities, collectively called "difficult wetland situations," including cyclic periods of drought and flooding or highly ephemeral stream systems. During periods of drought, for example, bank return flows are reduced and water tables are lowered. This results in a corresponding lowering of the OHWM and invasion of upland plant species into wetland areas. Conversely, extreme flooding may create physical evidence of high water well above what might be considered ordinary and may allow the temporary invasion of hydrophytic species into nonwetland areas. In the highly ephemeral systems typical of Southern California, these problems are encountered frequently. In these situations, professional judgment based on years of practical experience along with extensive knowledge of local ecological conditions comes into play in delineating wetlands. The Regional Supplement provides additional guidance for difficult wetland situations.

Hydrophytic Vegetation

Hydrophytic vegetation is plant life that grows and is typically adapted for life in permanently or periodically saturated soils. The hydrophytic vegetation criterion is met if more than 50 percent of the dominant plant species from all strata (tree, shrub, herb, and woody vine layers) are considered hydrophytic. Hydrophytic species are those included on the Corps most current *National Wetland Plant List* (Lichvar, R.W., et al. 2016). Each species on that list is rated according to a wetland indicator category, as shown in Table A. To be considered hydrophytic, the species must have wetland indicator status (i.e., be rated as Obligate Wetland [OBL], Facultative Wetland [FACW], or Facultative [FAC]).

Table A: Hydrophytic Vegetation

Category	Rating	Probability
Obligate Wetland	OBL	Almost always occur in wetlands (estimated probability > 99 percent)
Facultative Wetland	FACW	Usually occur in wetlands (estimated probability 67–99 percent)
Facultative	FAC	Equally likely to occur in wetlands and nonwetlands (estimated probability 34–66 percent)
Facultative Upland	FACU	Usually occur in nonwetlands (estimated probability 67–99 percent)
Obligate Upland	UPL	Almost always occur in nonwetlands (estimated probability > 99 percent)

The delineation of hydrophytic vegetation is typically based on the most dominant species from each vegetative stratum (strata are considered separately). When more than 50 percent of these dominant species are hydrophytic (i.e., FAC, FACW, or OBL), the vegetation is considered hydrophytic. In particular, the Corps recommends the use of the “50/20” rule (also known as the dominance test) from the Regional Supplement for determining dominant species. Under this method, dominant species are the most abundant species that immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional species composing 20 percent or more of the total dominance measure for the stratum.

In cases where indicators of hydric soil and wetland hydrology are present but the vegetation initially fails the dominance test, the prevalence index must be used. The prevalence index is a weighted average of all plant species within a sampling plot. The prevalence index is particularly useful when communities only have one or two dominants, where species are present at roughly equal coverage, or when strata differ greatly in total plant cover. In addition, Corps guidance provides that morphological adaptations may be considered when determining hydrophytic vegetation when indicators of hydric soil and wetland hydrology are present (Corps 2008). If the plant community passes either the dominance test or the prevalence index after reconsideration of the indicator status of any plant species that exhibit morphological adaptations for life in wetlands, then the vegetation is considered hydrophytic.

Hydric Soils

Hydric soils[1] are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.[2] Soils are considered likely to meet the definition of a hydric soil when one or more of the following criteria are met:

1. All Histels except Folistels and Histosols except Folists;
2. Soils that are frequently ponded for a long duration or very long duration[3] during the growing season; or
3. Soils that are frequently flooded for a long duration or very long duration during the growing season.

Hydric soils develop under conditions of saturation and inundation combined with microbial activity in the soil that causes a depletion of oxygen. Although saturation may occur at any time of year, microbial activity is limited to the growing season, when the soil temperature is above biologic zero (the soil temperature, measured at a depth of 20 inches, below which the growth and function of locally adapted plants are negligible). Biogeochemical processes that occur under anaerobic conditions during the growing season result in the distinctive morphologic characteristics of hydric soils. Based on these criteria, a National List of Hydric Soils was created from the National Soil Information System database and is updated annually.

The Regional Supplement has a number of field indicators that may be used to identify hydric soils. The United States Department of Agriculture (USDA) Natural Resources Conservation Service (Schoeneberger 2002) has also developed a number of field indicators that may demonstrate the presence of hydric soils. These indicators include hydrogen sulfide generation, the accumulation of organic matter, and the reduction, translocation, and/or accumulation of iron and other reducible elements. These processes result in soil characteristics that persist during both wet and dry periods. Separate indicators have been developed for sandy soils and for loamy and clayey soils.

Wetland Hydrology

Under natural conditions, development of hydrophytic vegetation and hydric soils is dependent on a third characteristic: wetland hydrology. Areas with wetland hydrology are those where the presence of water has an overriding influence on vegetation and soil characteristics due to anaerobic and reducing conditions, respectively (Corps 1987). The wetland hydrology parameter is satisfied if the

1 The hydric soil definition and criteria included in the 1987 Manual are obsolete. Users of the 1987 Manual are directed to the United States Department of Agriculture (USDA) Natural Resources Conservation Service website for the most current information on hydric soils.

2 Current definition as of 1994 (Federal Register 1994).

3 A long duration is defined as a single event ranging from 7–30 days. A very long duration is defined as a single event that lasts longer than 30 days.

area is seasonally inundated or saturated to the surface for a minimum of 14 consecutive days during the growing season in most years (Corps 2008).

Hydrology is often the most difficult criterion to measure in the field due to seasonal and annual variations in water availability. Indicators commonly used to identify wetland hydrology include visual observation of inundation or saturation, watermarks, recent sediment deposits, surface scour, and oxidized root channels (rhizospheres) resulting from prolonged anaerobic conditions.

RIVERS AND HARBORS ACT

The Rivers and Harbors Act (33 United States Code 408) is a federal law regulating activities that may affect navigation on the nation’s waterways, and a discussion of those sections follows.

Sections 9 and 10 of the Rivers and Harbors Act and Section 9 of the General Bridge Act require authorization for structures (including bridges) in or over any navigable waters of the U.S. Navigable waters of the U.S. are defined as those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Navigable waters are a subset of waters of the U.S., described above. Under Section 10 of the Rivers and Harbors Act (RHA), Corps jurisdiction over navigable waters of the U.S. extends from the ordinary low tide 3 nautical miles seaward (“territorial seas”) to the shoreward boundary of jurisdiction which extends to the line on the shore reached by the mean high water. This jurisdiction extends to this edge even though portions of the water body may be extremely shallow and are thus considered “navigable in law” although they may not be navigable in fact (33 CFR 329.12). Work in, over, under, or affecting tidally influenced waters requires authorization under Section 10 of the RHA.

Section 14 of the Rivers and Harbors Act, commonly referred to as “Section 408” provides that the Secretary of the Army, on the recommendation of the Chief of Engineers, may grant permission for the temporary occupation or use of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the United States. Permission from the USACE is required for the use, including modifications or alterations, of any flood control facility work built by the U.S. to ensure that the usefulness of the federal facility is not impaired. The permission for occupation or use is to be granted by the “appropriate real estate instrument in accordance with existing real estate regulations.” For USACE facilities, the Section 408 approval, known as Section 408 permit, is required.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The California Department of Fish and Wildlife (CDFW), through provisions of the California Fish and Game Code (Section 1600 et seq.), is empowered to issue agreements for any alteration of a river, stream, or lake where fish or wildlife resources may be adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks and at least an intermittent flow of water. The CDFW regulates wetland areas only to the extent that those wetlands are part of a river, stream, or lake as defined by the CDFW.

In obtaining CDFW agreements, the limits of wetlands are not typically determined. This is because the CDFW generally includes, within the jurisdictional limits of streams and lakes, any riparian habitat present. Riparian habitat includes willows, mule fat, and other vegetation typically associated with the banks of a stream or lake shorelines and may not be consistent with Corps definitions. In most situations, wetlands associated with a stream or lake would fall within the limits of riparian habitat. Thus, defining the limits of CDFW jurisdiction based on riparian habitat will automatically include any wetland areas and may include additional areas that do not meet Corps criteria for soils and/or hydrology (e.g., where riparian woodland canopy extends beyond the banks of a stream, away from frequently saturated soils).

REGIONAL WATER QUALITY CONTROL BOARD

The California RWQCB is responsible for the administration of Section 401 of the CWA. Typically, the areas subject to RWQCB jurisdiction coincide with those of the Corps (i.e., waters of the U.S., including any wetlands). The RWQCB may also assert authority over waters of the State under waste discharge requirements pursuant to the Porter-Cologne Act.

METHODOLOGY

The fieldwork for the jurisdictional delineation was conducted by field biologists Lonnie Rodriguez and Bo Gould on February 20, 2018. Potential federal and State jurisdictional features located in the Jurisdictional Delineation Limits were evaluated on foot and using aerial photographs.

Areas of potential jurisdiction were evaluated according to the most current Corps and CDFW regulatory criteria and guidance. The boundaries of the potential jurisdictional areas within the Jurisdictional Delineation Limits were observed in the field and mapped on an aerial photograph with a scale of 1 inch = 100 ft. Measurements of federal and State jurisdictional areas mapped during the course of the field investigation were determined by a combination of direct measurements taken in the field and measurements taken from the aerial photograph.

Areas supporting plant species that were potentially indicative of wetlands would have been evaluated according to routine wetland delineation procedures described in the Regional Supplement, but none were present within the Jurisdictional Delineation Limits. Hydrological conditions, including any surface inundation, saturated soils, scour marks, and/or other wetland hydrology indicators were also noted. General site characteristics were also noted throughout all potential jurisdictional areas, and photographs of potentially jurisdictional areas were taken (see Figure 3).

RESULTS

Based on close examination of historical and recent aerial photography and fieldwork, the consultant biologists identified one major drainage feature occurring in the Jurisdictional Delineation Limits (i.e. the Santa Ana River). Site-specific conditions and channel measurements were collected and the drainage feature was mapped.

Within the Jurisdictional Delineation Limits is the Fairview bridge, a continuous nine span bridge with reinforced concrete pier walls (see Figure 3 Representative Site Photos). The Santa Ana River conveys an intermittent flow under the bridge and is concrete lined within the Jurisdictional Delineation Limits. The channel bed is 180 feet wide and in the center of the channel is a linear low flow concave channel. The banks are 41 feet in height on the east and the west sides. The tops of the banks are earthen or asphalt and make up the Santa Ana River trail.

The Santa Ana River channel is entirely devoid of vegetation within the Jurisdictional Delineation Limits. The vegetation at the top of the banks is ornamental and appears to be regularly maintained along the Santa Ana River trail system. No other jurisdictional features were identified within the Jurisdictional Delineation Limits. No sample point was dug; the entire section of the Santa Ana River within the Jurisdictional Delineation Limits is lined with concrete.

UNITED STATES ARMY CORPS OF ENGINEERS JURISDICTION

Non-Wetland Waters of the United States

The Santa Ana River within the Jurisdictional Delineation Limits is a concrete-lined intermittent drainage feature. This drainage conveys flows attributed to local urban runoff and from seasonal storms. The low-flow channel located within the center of the channel bed had standing water at the time of the survey. The Santa Ana River contained an OHWM that was determined to be 21 feet up from the channel bed. Three measurements were taken within the trapezoidal channel of the Santa Ana River to determine the OHWM. The first measurement was from the toe-of-slope to the edge of the bike path under the bridge (19 ft), the second measurement was from the toe-of-slope to the horizontal terrace located up the bank (27.2 ft), and the third measurement was from the toe-of slope to the top of bank (43.2 ft). Using the three measurements and Google Earth historical imagery, the OHWM was determined to be 21 ft. The river has a direct nexus to the Pacific Ocean, a navigable water of the U.S., and is tidally influenced at its mouth. However, the tidal influence does not extend to the Jurisdictional Delineation Limits, and there are no waters subject to jurisdiction under Section 10 of the RHA. No wetlands were identified within the Jurisdictional Delineation Limits.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE JURISDICTION

Jurisdictional Streambeds

This intermittent concrete-lined drainage feature is defined by the presence of a channel bed and bank, and therefore, CDFW would consider the entire feature to the top of the bank to be jurisdictional.

CONCLUSIONS

UNITED STATES ARMY CORPS OF ENGINEERS JURISDICTION

The Santa Ana River is subject to potential Corps jurisdiction pursuant to Section 404 of the CWA. This drainage exhibits an OHWM, conveys intermittent flows, and has a direct nexus to the Pacific Ocean (a TNW); therefore, Drainage 1 (Santa Ana River) would be considered a water of the U.S. In addition, the Santa Ana River is a USACE facility under Section 14 ("Section 408") of the Rivers and Harbors Act of 1899, so Section 408 permission will also be required for the Project. Table B provides a breakdown of the drainage acreage within the study area that is subject to potential Corps jurisdiction.

Table B: Delineated Corps Jurisdictional Areas

Drainage ID	Nonwetland Waters (acres)	Wetlands (acres)	Total Corps Jurisdiction (acres)
Drainage 1 (Santa Ana River)	4.18	-	4.18

Note: Totals are rounded to two decimal places.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE JURISDICTION

CDFW jurisdiction in the Jurisdictional Delineation Limits is associated with Drainage 1. This feature is defined by a channel bed and bank, and functions as an intermittent drainage; therefore, it would be subject to potential CDFW jurisdiction pursuant to Section 1602 of the California Fish and Game Code. Table C provides a summary of the CDFW jurisdictional areas within the Jurisdictional Delineation Limits.

Table C: Delineated CDFW Jurisdictional Areas

Drainage ID	Total CDFW Jurisdiction (acres)
Drainage 1 (Santa Ana River)	5.55

REGIONAL WATER QUALITY CONTROL BOARD JURISDICTION

RWQCB jurisdiction was determined based on the federal definition of waters of the U.S., as recommended by the State Water Resources Control Board's *Workplan: Filling the Gaps in Wetland Protection* (2004). As such, RWQCB jurisdiction is considered coincident with Corps jurisdiction for purposes of Section 401 certification.

DISCLAIMER

The findings and conclusions presented in this report, including the locations and extents of wetlands and other waters subject to regulatory jurisdiction (or lack thereof), represent the professional opinion of the consultant biologists. These findings and conclusions should be considered preliminary until verified by the appropriate regulatory agencies.

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APPENDIX A

FIGURES 1–3

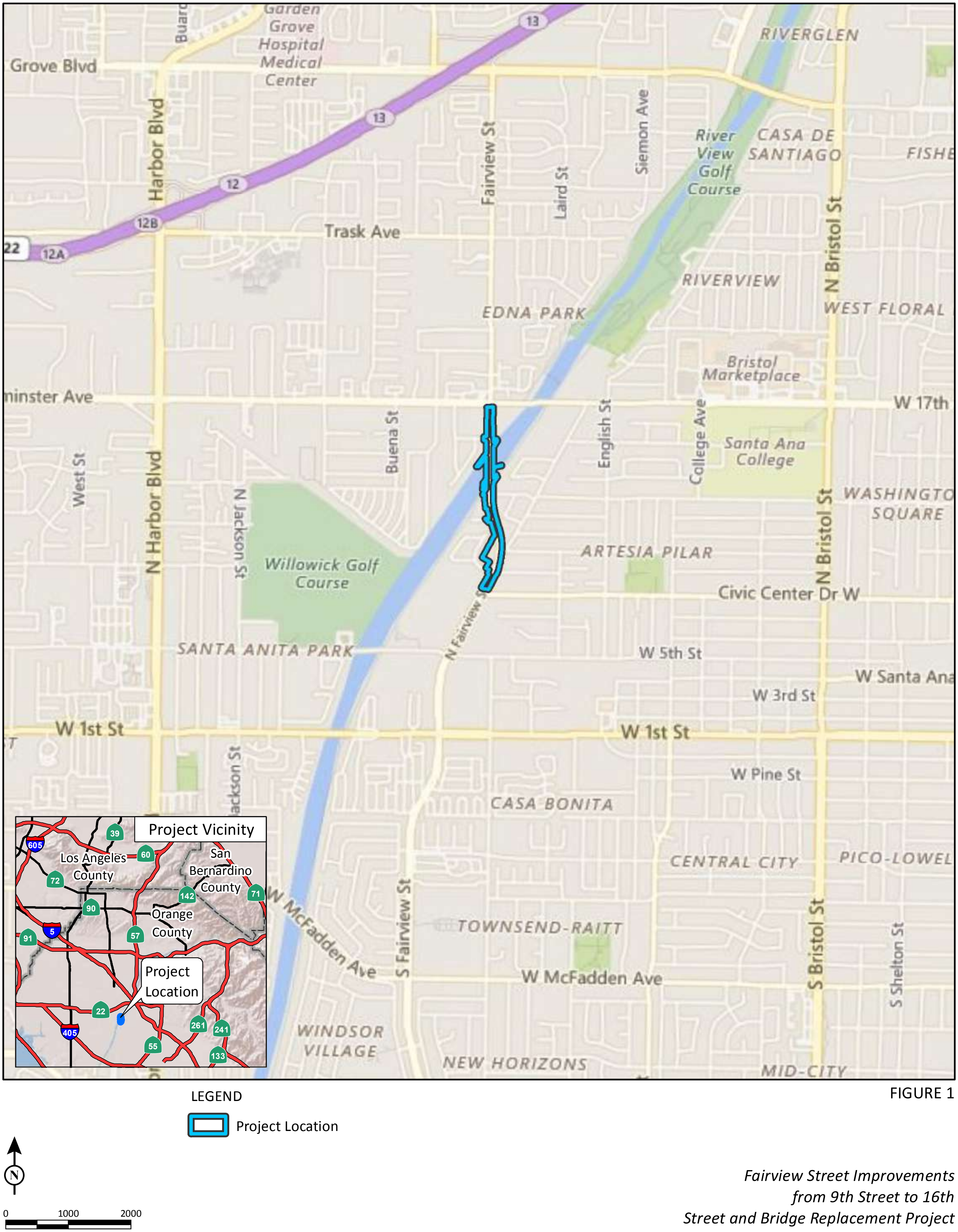

FIGURE 1

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Project Location

SOURCE: Bing (2015)

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LEGEND

Biological Study Area (BSA)

Jurisdictional Delineation Limits

Corps (4.18 acres)

CDFW (5.55 acres)

0 175 350

FEET

SOURCE: Bing (2016)

FIGURE 2

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Jurisdictional Delineation Map

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Southwest view, looking at the concrete pier walls of the Fairview Bridge.

View of The Santa Ana River Trail and the south side of the Fairview Bridge, looking northwest.

View of concave low flow channel in center of the channel bed with standing water.

View of channel bed and bank, looking southeast.

LSA

FIGURE 3

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Representative Site Photos

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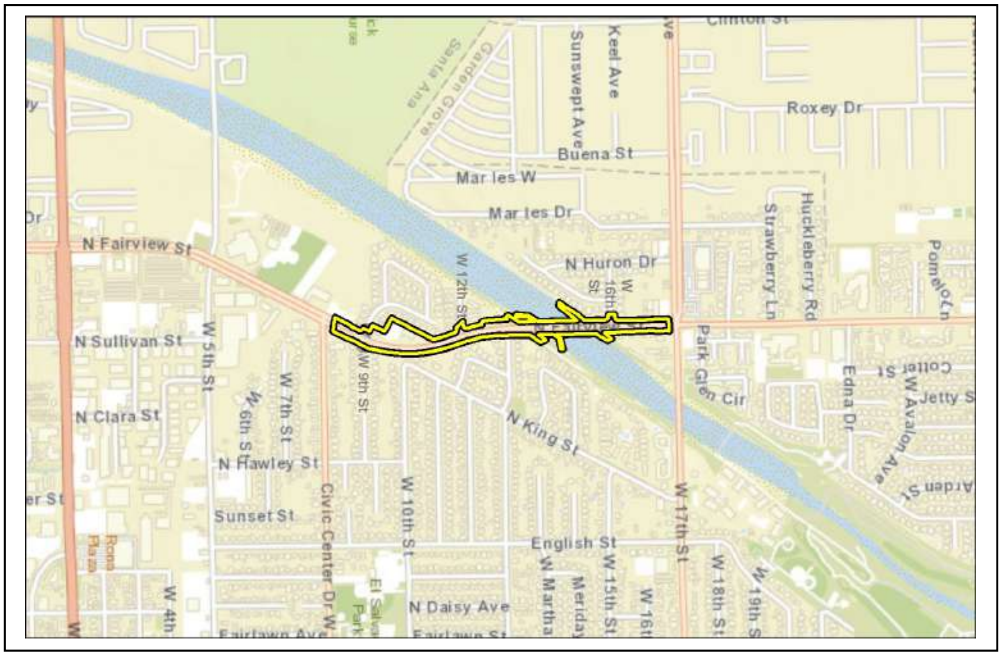
APPENDIX A

Appendix A Historic Property
Survey Report



Noise Abatement Decision Report

Santa Ana, California

Federal Project No. BRLS 5063(184)

June 2019

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Noise Abatement Decision Report

Fairview Street Improvements from 9th Street to 16th Street

and Bridge Replacement Project

Santa Ana, California

Federal Project No. BRLS 5063(184)

June 2019

Prepared By: Jason Lui Date: 6/12/19

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Table of Contents

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List of Abbreviated Terms

23 CFR 772	Title 23, Code of Federal Regulations, Part 772
APE	Area of Potential Effect
APN	Assessor's Parcel Number
BMPs	best management practices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Santa Ana
dB	decibels
dBA	A-weighted decibels
ED	Environmental Document
EW	Existing Wall
FHWA	Federal Highway Administration
ft	foot/feet
HRER	Historical Resources Evaluation Report
L_{eq}	equivalent continuous sound level
LOS	level(s) of service
LSA	LSA Associates, Inc.
NAC	Noise Abatement Criteria
NADR	Noise Abatement Decision Report
NB	Noise Barrier
NSR	Noise Study Report
PDT	Project Development Team
Protocol	Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
PS&E	Plans, Specifications, and Estimates
SART	Santa Ana River Trail
TNM	Traffic Noise Model
vplph	vehicles per lane per hour

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Chapter 1. Introduction

The Noise Abatement Decision Report (NADR) presents the preliminary noise abatement decision as defined in the California Department of Transportation (Caltrans) *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Protocol). This report has been approved by a California licensed professional civil engineer. The Noise Study Report (NSR) for the Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project, was approved in January 2019 and is hereby incorporated by reference.

1.1. Noise Abatement Assessment Requirements

Title 23, Code of Federal Regulations, Part 772 (23 CFR 772) of the Federal Highway Administration (FHWA) standards and the Protocol require that noise abatement be considered for projects that are predicted to result in traffic noise impacts. A traffic noise impact is considered to occur when future predicted design-year noise levels with the project "approach or exceed" the Noise Abatement Criteria (NAC) defined in 23 CFR 772 or when the predicted design-year noise levels with the project substantially exceed existing noise levels. A predicted design-year noise level is considered to "approach" the NAC when it is within 1 decibel (dB) of the NAC. A substantial increase is defined as being 12 A-weighted decibels (dBA) or more over the corresponding existing noise level.

The FHWA standards (23 CFR 772) require that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project be identified before completion of the environmental review process.

The Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. A preliminary noise abatement decision is made based on the feasibility of evaluated abatement and the preliminary reasonableness determination. Noise abatement is considered to be acoustically feasible if it provides a noise reduction of 5 dBA or more at receptors subject to noise impacts. Other non-acoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, and security can also affect feasibility.

For a noise barrier to be considered reasonable, the noise level reduction design goal of 7 dBA must be achieved at one or more benefited receptors. Once it is determined that one or more receptors satisfy the minimum noise reduction required, the preliminary reasonableness determination is made by calculating an allowance that is considered to be a reasonable amount of money, per benefited residence, to spend on abatement. This reasonable allowance is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance, the preliminary determination is that the abatement is reasonable. If the cost estimate is higher than the allowance, the preliminary determination is that abatement is not reasonable.

The NADR presents the preliminary noise abatement decision based on acoustical and non-acoustical feasibility factors and the relationship between noise abatement allowances and the engineer's cost estimate. The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process that is based on the best available information at the time. The final overall reasonableness decision will take this information into account, along with other reasonableness factors identified during the environmental review process. These factors may include:

- The noise reduction design goal;
- The cost of noise abatement; and
- The viewpoints of the benefited receptors (including property owners and residents of the benefited receptors).

The preliminary noise abatement decision will become the final noise abatement decision unless compelling information received during the environmental review process indicates that it should be changed.

1.2. Purpose of the Noise Abatement Decision Report

The purpose of the NADR is to:

- Summarize the conclusions of the NSR relating to acoustical feasibility and the reasonable allowances for abatement evaluated;
- Present the engineer's cost estimate for evaluated abatement;
- Present the engineer's evaluation of non-acoustical feasibility issues;
- Present the preliminary noise abatement decision; and
- Present preliminary information on the secondary effects of abatement (impacts on cultural resources, scenic views, hazardous materials, and biological resources, etc.).

The NADR does not address noise barriers or other noise-reducing treatments required as mitigation for significant adverse environmental effects identified under the California Environmental Quality Act (CEQA).

1.3. Project Description

The City of Santa Ana (City), in conjunction with Caltrans District 12 proposes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed project) in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction that are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

Two alternatives, including the No Build Alternative, were developed to meet the identified purpose and need of the proposed project while avoiding or minimizing environmental impacts. The project alternatives are described below.

1.3.1. No Build Alternative

The No Build Alternative assumes that no improvements are made to Fairview Street. The No Build Alternative would maintain the existing conditions and provides a baseline for comparison of the impacts under the Build Alternative. Under the No Build Alternative, the performance of the roadway would continue to deteriorate with the forecasted increase in traffic on the bridge and the non-standard shoulders would remain with no sidewalk.

1.3.2. Build Alternative

The proposed project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River. The proposed project would widen Fairview Street from two lanes in each direction to three lanes in each direction, as shown on Figures 1-1 and 1-2. The Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

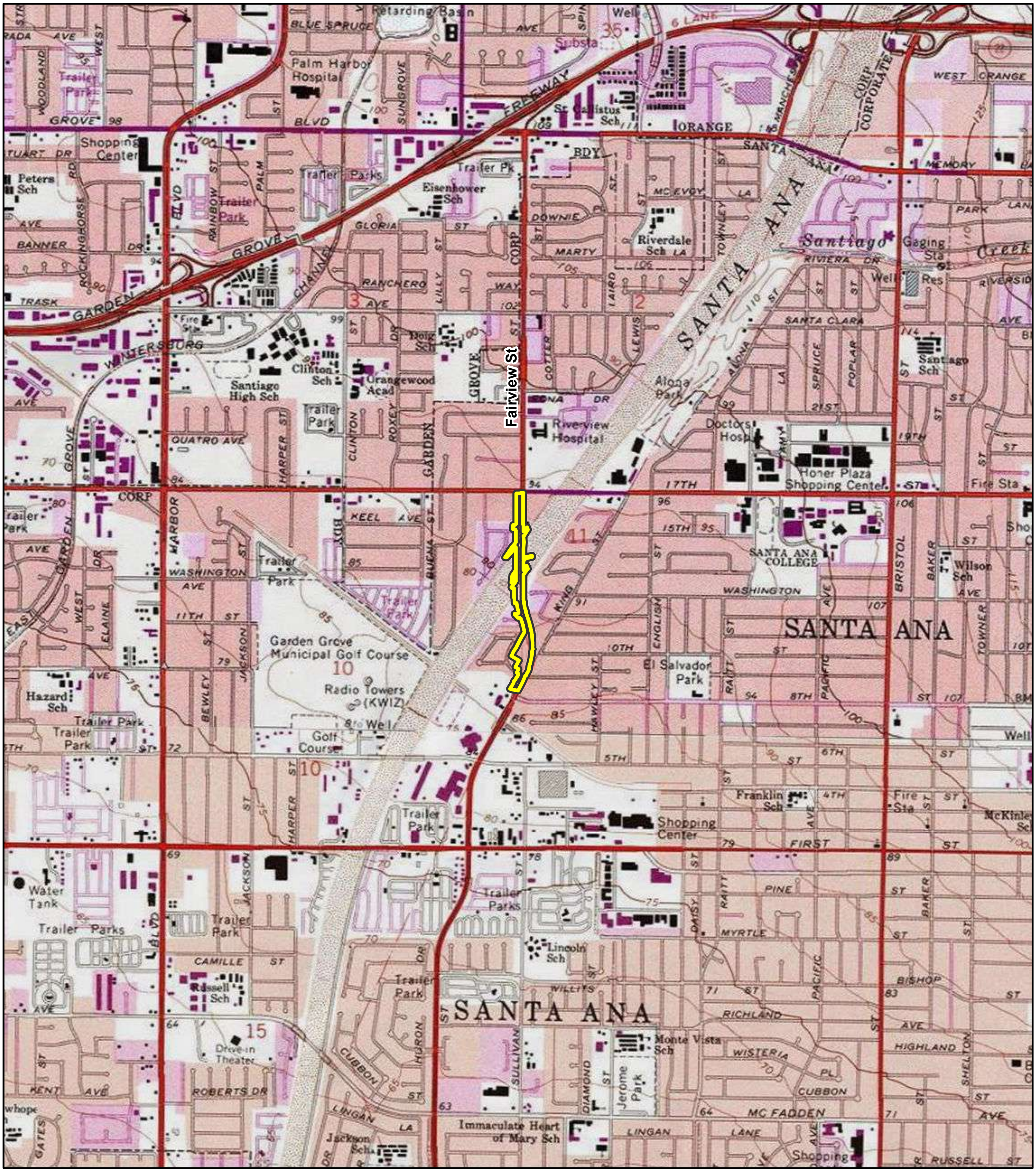
The proposed bridge would be expanded from approximately 52 feet (ft) to 100 ft in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

The proposed project would partially acquire right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APNs) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]), as shown on Figure 1-2. Although not known at this time, there is the potential for one full take at the single-family residence (APN 405-213-14) if the property owner is concerned about the loss of a portion of the side yard; this will be determined during final design in consultation with the property owner.

An existing 12-inch-diameter water line and a bank of 12 phone conduits are suspended under the deck of the existing bridge and span the Santa Ana River. These utilities would need to be temporarily relocated during construction, after which they would be permanently relocated to the new bridge.

Water quality best management practices (BMPs) would be included to treat stormwater runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.



LEGEND

Project Location

FIGURE 1-1

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Fairview Street Improvements
from 9th Street to 16th Street and
Bridge Replacement Project

Regional Location and Project Area

Federal Project No.: BRLS 5063(184)

SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

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LEGEND

- Project Area
- Proposed Right of Way
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- Proposed Construction Access

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SOURCE: WKE (3/2018); Google (2016)

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FIGURE 1-2

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Proposed Project

Federal Project No.: BRLS 5063(184)

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During construction, pedestrians and bikes would be detoured away from the Fairview Street bridge to the 17th Street bridge to cross the Santa Ana River by way of the Santa Ana River Trail (SART) between the hours of 9:00 a.m. and 7:00 p.m. while the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists who wish to cross the Santa Ana River would be detoured to adjacent city streets such as King Street.

Construction of the proposed Project would require temporary closure of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of the SART affected by project construction would need to be temporarily closed four times for approximately 8 hours each during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detours are being coordinated with Orange County Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the river bed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the river bed.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the project area. All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to pre-construction conditions or better prior to project completion.

1.4. Affected Land Uses

Developed and undeveloped land uses in the project vicinity were identified through land use maps, aerial photography, and site inspection. Receptors were identified in each land use category. Existing land uses in the project area include single-family and multifamily residences, a medical office, a trailside rest area (Fairview Triangle), the Santa Ana River Trail (SART), vacant land, and commercial and light industrial uses. Existing land uses in the project area and surrounding vicinity are described in further detail as follows:

- East of Fairview Street and South of the Santa Ana River (Receptors R-2 through R-7, R-11, R-12, R-13, R-17, R-18, R-24 through R-30, R-37 through R-45, R-48 through R-50, and R-53 through R-67): Land uses in this area include single-family and multifamily residences, commercial uses, and vacant land. Land uses in this area range from 3 ft higher in elevation than Fairview Street to 7 ft lower in elevation than Fairview Street. Currently, 4 ft to 13.5 ft high existing walls along the private property lines shield the single-family residences.
- **West of Fairview Street and South of the Santa Ana River (Receptors R-1, R-8 through R-10, R-14 through R-16, R-19 through R-23, R-31 through R-36, R-46, R-47, R-51, and R-52):** Land uses in this area include single-family and multifamily residences, a medical office, Fairview Triangle, SART, and office uses. Land uses in this area range from 2 ft higher in elevation than Fairview Street to 5 ft lower in elevation than Fairview Street. Currently, 2.7 ft to 9.3 ft high existing walls along the private property lines shield the single-family and multifamily residences.
- **East of Fairview Street and North of the Santa Ana River (Receptors R-85 through R-92):** Land uses in this area include single-family residences and commercial and light industrial uses. Land uses in this area range from 2 ft higher in elevation than Fairview Street to approximately the same elevation as Fairview Street. Currently, a 6.7 ft high existing wall along the private property line shields the commercial use.
- **West of Fairview Street and North of the Santa Ana River (Receptors R-68 through R-84):** Land uses in this area include single-family residences, vacant land, and commercial and light industrial uses. Land uses in this area range from 2 ft higher in elevation than Fairview Street to 9 ft lower in elevation than Fairview Street. Currently, 6.7 ft to 10.7 ft high existing walls along the private property lines shield the single-family residences.

Chapter 2. Results of the Noise Study Report

The NSR for this project was approved in January 2019.

2.1. Noise Impact Locations

Potential long-term noise impacts associated with project operations are solely from traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Using coordinates obtained from the topographic maps, 92 receptor locations associated with existing single- and multifamily residences, a medical office, Fairview Triangle, SART, vacant land, and commercial and light industrial uses were identified as receptors within the study area. Figure 2-1 shows these receptor locations.

Future traffic noise levels at all 92 receptor locations were determined using either the worst-case traffic operations (prior to speed degradation) or the 2040 a.m. peak-hour traffic volumes, whichever were lower. The worst-case traffic condition is assumed to be level of service (LOS) C and is generally loudest when vehicles on a given roadway travel at free-flowing traffic conditions. Accordingly, the 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. The worst-case traffic condition is assumed to be 750 vehicles per lane per hour (vplph) on Fairview Street and other local roadways. The a.m. peak-hour traffic volume was selected over the p.m. peak-hour traffic volume because the worst-hour noise levels based on the long-term (24-hour) noise level measurements occur during the a.m. hour. The a.m. and p.m. peak-hour traffic volumes were obtained from the *Traffic Impact Analysis* (LSA 2018).

The modeled future noise levels with the project were compared to the modeled existing noise levels (after calibration) from Traffic Noise Model (TNM) 2.5 to determine whether a substantial noise increase would occur. The modeled future noise levels were also compared to the NAC to determine whether a traffic noise impact would occur.

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LEGEND

- Short-Term Monitoring Locations
- Long-Term Monitoring Locations
- Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls

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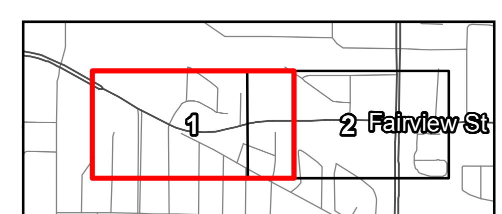

FIGURE 2-1
Sheet 1 of 2

Fairview Street Improvements
from 9th Street to 16th Street and Bridge Replacement Project
Monitoring and Modeled Receptor Locations
Federal Project No.: BRLS 5063(184)

SOURCE: Google Aerial (12/2017); WKE (2017)
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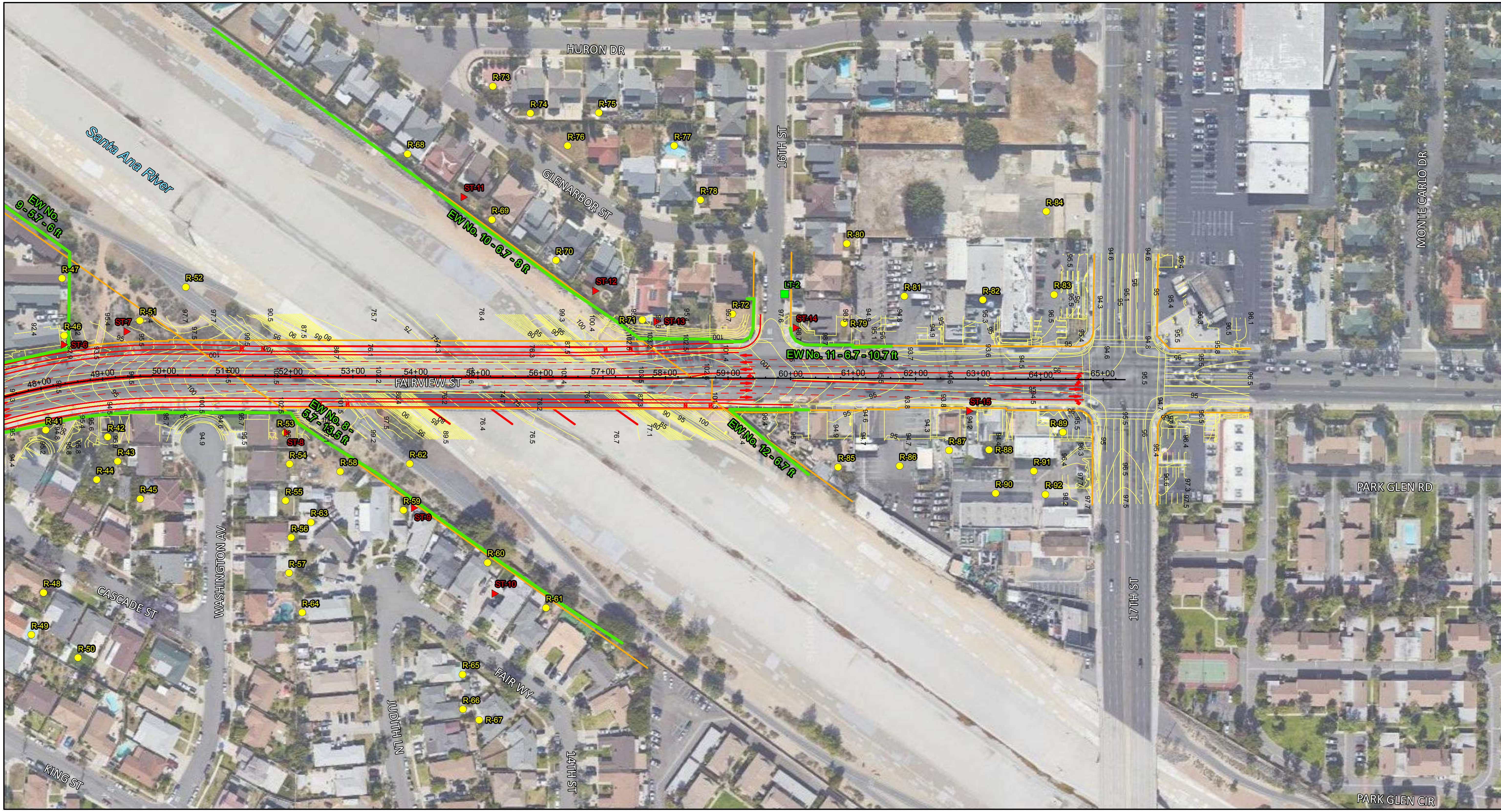

LEGEND

- ▲ Short-Term Monitoring Locations
- ■ Long-Term Monitoring Locations
- ● Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls

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SOURCE: Google Aerial (12/2017); WKE (2017)

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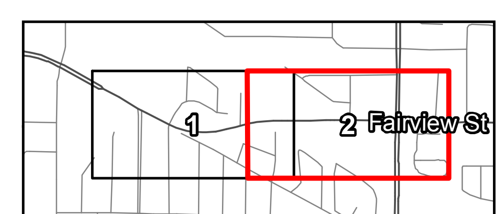

FIGURE 2-1
Sheet 2 of 2

Fairview Street Improvements
from 9th Street to 16th Street and Bridge Replacement Project
Monitoring and Modeled Receptor Locations

Federal Project No.: BRLS 5063(184)

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Of the 92 modeled receptors, 9 receptors under the Future Build condition would approach or exceed the NAC. No receptor would experience a substantial noise increase of 12 dBA or more over its corresponding modeled existing noise level under any scenario.

The receptor locations listed below would be or would continue to be exposed to noise levels that either approach or exceed the NAC under Future Build conditions:

- **Receptor R-5:** This receptor location represents an existing single-family residence on the northbound side of Fairview Street between Civic Center Drive and West 9th Street. Currently, a 4.7 ft high existing wall (Existing Wall [EW] No. 1) shields the residence. One noise barrier (NB No. 1) was modeled along the private property line on the northbound side of Fairview Street to shield this residence.
- **Receptor R-8:** This receptor location represents an existing single-family residence on the southbound side of Fairview Street between Civic Center Drive and West 9th Street. Currently, a 2.7 ft to 6 ft high existing wall (EW No. 2) shields this residence. One noise barrier (NB No. 2) was modeled along the private property line on the southbound side of Fairview Street to shield this residence.
- **Receptor R-14:** This receptor location represents an existing single-family residence on the southbound side of Fairview Street between West 9th Street and West 12th Street. Currently, a 5.3 ft high existing wall (EW No. 4) shields this residence. One noise barrier (NB No. 3) was modeled along the private property line on the southbound side of Fairview Street to shield this residence.
- **Receptor R-23:** This receptor location represents existing multifamily residences on the southbound side of Fairview Street between West 9th Street and West 12th Street. Existing wood fences along the private property line would not provide effective noise attenuation at these residences. One noise barrier (NB No. 4) was modeled along the private property line on the southbound side of Fairview Street to shield these residences.
- **Receptors R-24, R-25, and R-40:** These receptor locations represent existing single-family residences on the northbound side of Fairview Street between West 9th Street and West 12th Street. Currently, a 4 ft to 6 ft high wall (EW No. 5) shields these residences. One noise barrier (NB No. 5) was modeled along the private property line on the northbound side of Fairview Street to shield these residences.

- **Receptor R-46:** This receptor location represents an existing single-family residence on the southbound side of Fairview Street between West 12th Street and the Santa Ana River. Currently, a 5.7 ft high existing wall (EW No. 9) shields this residence. One noise barrier (NB No. 6) was modeled along the private property line on the southbound side of Fairview Street to shield this residence.
- **Receptor R-51:** This receptor location represents Fairview Triangle on the southbound side of Fairview Street between West 12th Street and the Santa Ana River. Currently, no wall shields Fairview Triangle. Because there is a driveway and pedestrian access onto Fairview Street, it is not feasible to abate traffic noise from Fairview Street with noise barriers.

2.2. Locations for Evaluated Noise Abatement

Noise abatement measures such as noise barriers were considered in order to shield receptors within the study area that would become or would continue to be exposed to traffic noise levels approaching or exceeding the NAC. Noise barriers were analyzed for each of these receptor locations. Depending on the location of the potential barrier and existing barrier height, noise barrier heights from 6 to 16 ft were analyzed at 2 ft increments. The location of the modeled noise barrier is shown on Figure 2-2.

The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic noise levels approaching or exceeding the NAC for the Future Build conditions:

- **NB No. 1:** A 169 ft long barrier along the right-of-way and private property line on the northbound side of Fairview Street between Civic Center Drive and 9th Street was analyzed to shield Receptor R-5.
- **NB No. 2:** A 129 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between Civic Center Drive and 9th Street was analyzed to shield Receptor R-8.
- **NB No. 3:** A 113 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptor R-14.
- **NB No. 4:** A 171 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptor R-23.

LEGEND

- Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls
- Modeled Noise Barriers

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SOURCE: Google Aerial (12/2017); WKE (2017)

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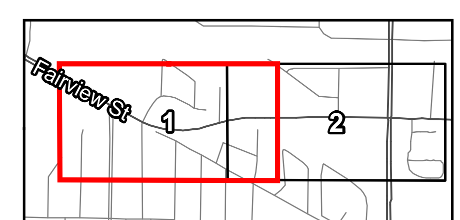

FIGURE 2-2

Sheet 1 of 2

Fairview Street Improvements
from 9th Street to 16th Street and Bridge Replacement Project

Modeled Noise Barrier and Receptor Locations

Federal Project No.: BRLS 5063(184)

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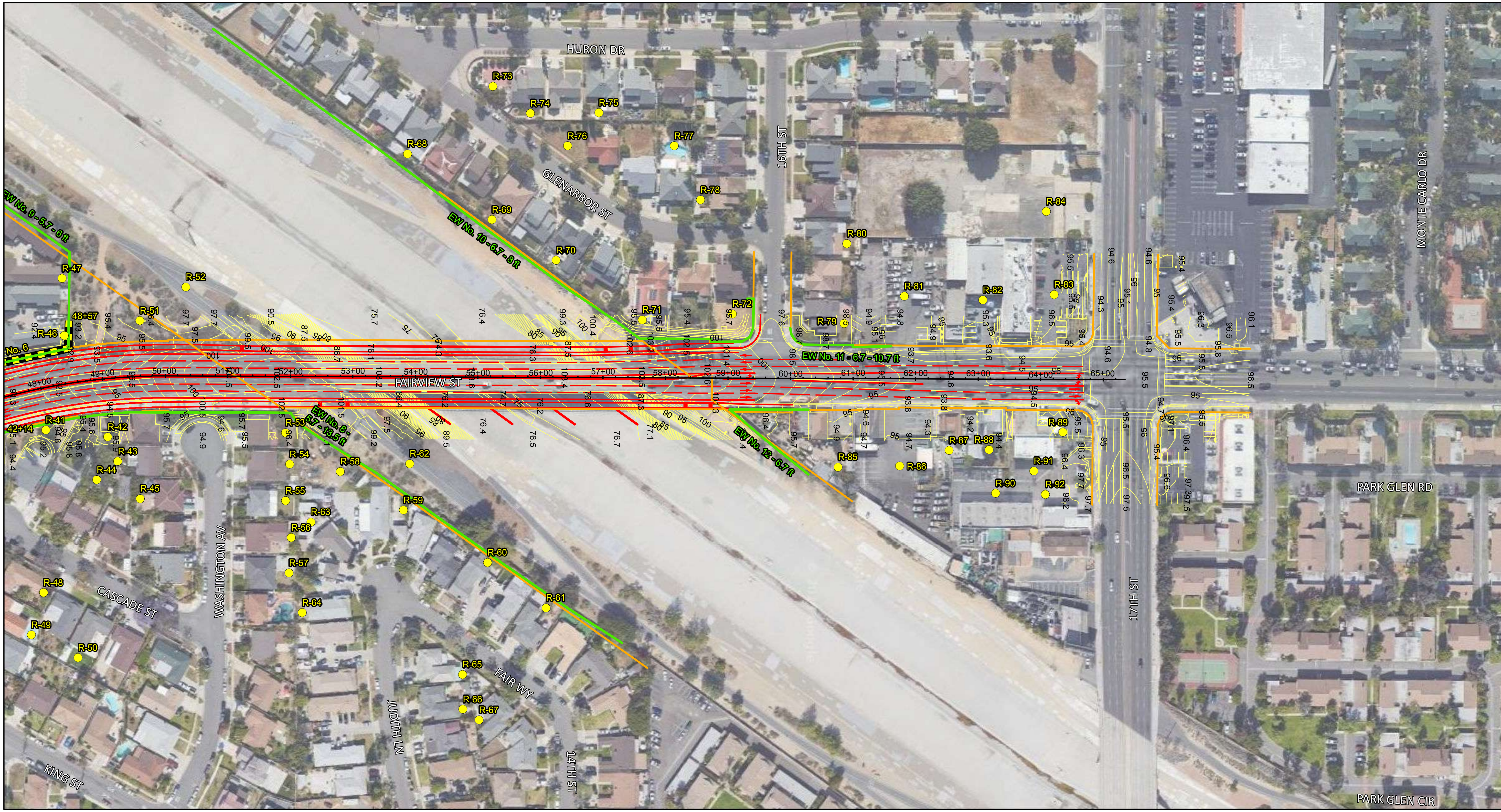

LEGEND

- Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls
- Modeled Noise Barriers

0 75 150
FEET

SOURCE: Google Aerial (12/2017); WKE (2017)

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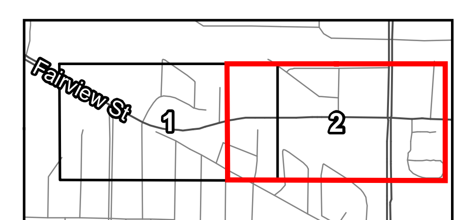

FIGURE 2-2

Sheet 2 of 2

Fairview Street Improvements
from 9th Street to 16th Street and Bridge Replacement Project

Modeled Noise Barrier and Receptor Locations

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- **NB No. 5:** A 705 ft long barrier along the right-of-way on the northbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptors R-24, R-25, and R-40.
- **NB No. 6:** A 184 ft long barrier along the right-of-way and private property line on the southbound side of Fairview Street between West 12th Street and the Santa Ana River was analyzed to shield Receptor R-46.

2.3. Feasible Noise Barriers

Section 3 of the Protocol states that a minimum noise reduction of 5 dBA must be achieved at the impacted receptors in order for the proposed noise abatement measure to be considered feasible. Greater noise reductions are encouraged if they can be reasonably achieved. Feasibility may also be restricted by the following factors: (1) topography, (2) access requirement for driveways, (3) presence of local cross-streets, (4) underground utilities, (5) other noise sources in the area, and (6) safety considerations.

Table 2.1 summarizes the feasibility of the modeled noise barriers and lists the noise barrier heights, approximate lengths, the noise attenuation, the number of benefited units/receptors, the total reasonable allowance, beginning and ending station number, and the beginning and ending top of wall elevation under the Future Build conditions. Of the six modeled noise barriers evaluated for the Future Build conditions, all noise barriers were determined to be feasible.

Table 2.1: Summary of Feasible Noise Barriers from the Noise Study Report

Noise Barrier No.	Height (ft)	Approximate Length (ft)	Noise Attenuation (dBA)	Number of Benefited Receptors/Units[1]	Total Reasonable Allowance[2]	Noise Barrier Location	Noise Barrier Station Number		Top of Wall Elevation (ft)	
							Begin	End	Begin	End
1	8	169	5	1	$95,000	ROW/PL	36+55	37+31	96.97	96.35
	10	169	7	1	$95,000				98.97	98.35
	12[3]	169	8	1	$95,000				100.97	100.35
	14	169	9	1	$95,000				102.97	102.35
	16	169	10	1	$95,000				104.97	104.35
2	8	129	6	1	$95,000	ROW/PL	36+30	37+07	96.46	96.00
	10	129	8	1	$95,000				98.46	98.00
	12[3]	129	9	1	$95,000				100.46	100.00
	14	129	10	1	$95,000				102.46	102.00
	16	129	11	1	$95,000				104.46	104.00
3	8	113	6	1	$95,000	ROW/PL	38+70	39+22	96.74	98.00
	10[3]	113	7	1	$95,000				98.74	100.00
	12	113	7	1	$95,000				100.74	102.00
	14	113	8	1	$95,000				102.74	104.00
	16	113	8	1	$95,000				104.74	106.00
4	6	171	7	2	$190,000	ROW/PL	43+45	45+15	96.23	96.00
	8	171	10	2	$190,000				98.23	98.00
	10	171	12	2	$190,000				100.23	100.00
	12[3]	171	14	2	$190,000				102.23	102.00
	14	171	15	2	$190,000				104.23	104.00
	16	171	16	2	$190,000				106.23	106.00
5	6	705	6	2	$190,000	ROW	40+45	42+14	100.25	95.00
	8	705	9	3	$285,000				102.25	97.00
	10	705	11	3	$285,000				104.25	99.00
	12[3]	705	13	5	$475,000				106.25	101.00
	14	705	14	7	$665,000				108.25	103.00
	16	705	16	7	$665,000				110.25	105.00
6	10	184	7	1	$95,000	ROW/PL	47+16	48+57	103.45	101.01
	12[3]	184	8	1	$95,000				105.45	103.01
	14	184	9	1	$95,000				107.45	105.01
	16	184	10	1	$95,000				109.45	107.01

Source: Compiled by LSA Associates, Inc. (2019).

[1] Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.

[2] Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).

[3] Denotes the minimum wall height required to break the line-of-sight between the receptor and a truck exhaust stack.

dBA = A-weighted decibels PL = property line
ft = foot/feet ROW = right-of-way

Chapter 3. Preliminary Noise Abatement Decision

3.1. Summary of Key Information

Utilizing the information in Chapter 2, barriers considered to be feasible are analyzed to determine their reasonableness. As stated in Section 5.4 of the NSR, the overall reasonableness of noise abatement is determined by considering factors such as the noise reduction design goal and the construction cost of the barrier. For a noise barrier to be considered reasonable, the noise level reduction design goal of 7 dBA must be achieved at one or more of the benefited receptors. For any noise barrier to be considered reasonable from a cost perspective, the estimated construction cost of the noise barrier would be equal to or less than the total cost allowance calculated for the barrier. The total reasonable allowance was determined based on the number of benefited receptors multiplied by the reasonable allowance per residence. The estimated noise barrier construction costs for each barrier were developed by WKE, Inc. in December 2018 and are shown in Table 3.1 as well as in Appendix A. If the estimated noise barrier construction cost exceeds the total reasonable allowance, the noise barrier is determined to be not reasonable. However, if the estimated noise barrier construction cost is within the total reasonable allowance, the noise barrier is determined to be reasonable.

A summary of abatement information in Table 3.1 lists all the feasible noise barriers under the Future Build conditions, along with their locations, heights, approximate lengths, the noise attenuation levels, the number of benefited units/receptors, the total reasonable allowance per barrier, the estimated construction costs, and whether the barriers are reasonable. As shown in Table 3.1, NB Nos. 2 through 5 were determined to be reasonable and NB Nos. 1 and 6 were determined to be not reasonable because the estimated construction cost exceeded the total reasonable allowance. It should be noted that NB Nos. 2, 3 (at 12 ft and 14 ft high), 4, and 5 require the property owner to donate their right-of-way (permanent and temporary easement) in order to achieve reasonableness.

Table 3.1: Summary of Abatement Key Information for the Build Alternative

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Level (dBA)	Number of Benefited Receptors/Units[1]	Total Reasonable Allowance[2]	Estimated Construction Cost (Without ROW Donation)[3]	Reasonable ?	Estimated Construction Cost (With ROW Donation)[3]	Reasonable ?
1	ROW/PL	8	169	5	1	$95,000	--[4]	No	-	No
		10	169	7	1	$95,000	$225,898	No	$207,758	No
		12[5]	169	8	1	$95,000	$242,676	No	$224,536	No
		14	169	9	1	$95,000	$261,270	No	$243,130	No
		16	169	10	1	$95,000	$275,138	No	$256,998	No
2	ROW/PL	8	129	6	1	$95,000	--	No	-	No
		10	129	8	1	$95,000	$103,251	No	$86,701	Yes
		12[5]	129	9	1	$95,000	$116,218	No	$99,668	No
		14	129	10	1	$95,000	$129,533	No	$112,983	No
		16	129	11	1	$95,000	$140,126	No	$123,576	No
3	ROW/PL	8	113	6	1	$95,000	--	No	-	No
		10[5]	113	7	1	$95,000	$86,910	Yes	$69,880	Yes
		12	113	7	1	$95,000	$98,299	No	$81,269	Yes
		14	113	8	1	$95,000	$110,192	No	$93,162	Yes
		16	113	8	1	$95,000	$119,492	No	$102,462	No
4	ROW/PL	6	171	7	2	$190,000	$208,301	No	$184,391	Yes
		8	171	10	2	$190,000	$223,396	No	$199,486	No
		10	171	12	2	$190,000	$237,517	No	$213,607	No
		12[5]	171	14	2	$190,000	$254,459	No	$230,549	No
		14	171	15	2	$190,000	$273,220	No	$249,310	No
		16	171	16	2	$190,000	$289,097	No	$265,187	No
5	ROW	6	705	6	2	$190,000	--	No	-	No
		8	705	9	3	$285,000	$461,186	No	$412,536	No
		10	705	11	3	$285,000	$520,938	No	$472,288	No
		12[5]	705	13	5	$475,000	$593,082	No	$544,432	No
		14	705	14	7	$665,000	$669,344	No	$620,694	Yes
		16	705	16	7	$665,000	$736,731	No	$688,081	No
6	ROW/PL	10	184	7	1	$95,000	$130,841	No	$119,941	No
		12[5]	184	8	1	$95,000	$149,114	No	$138,214	No
		14	184	9	1	$95,000	$169,047	No	$158,147	No
		16	184	10	1	$95,000	$185,990	No	$175,090	No

Source: Compiled by LSA Associates, Inc. (2019).

1 Number of receptors/units that are attenuated by 5 dBA or more by the modeled barrier.

2 Calculated by multiplying the number of benefited receptors by $95,000 (the dollar amount per benefited receptor/unit).

3 Construction cost estimate provided by WKE, Inc. (2018).

4 Shaded area represents barrier heights that have been determined to be not reasonable because the barrier would not reduce noise levels by 7 dBA or more.

5 Denotes the minimum wall height required to break the line of sight between the receptor and a truck exhaust stack.

dBA = A-weighted decibels ft = foot/feet ROW = right-of-way

3.2. Non-Acoustical Factors Relating to Feasibility

Nonacoustical factors relating to feasibility that must be considered during the construction of noise barriers include: geometric standards, safety, maintenance, security, drainage, geotechnical considerations, and utility relocations.

3.2.1. Build Alternative

The nonacoustical factors relating to the feasibility of NB Nos. 2 through 5 are:

- **Geometric Standards:** NB Nos. 2 through 5 would not affect the geometric standards of adjacent roadways.
- **Safety:** NB Nos. 2 through 5 would not affect sight distance for vehicular or pedestrian traffic.
- **Maintenance:** Temporary construction easements would be required for NB Nos. 2 through 5. The property owner would be responsible for maintaining the private side of the barrier while the City would be responsible for maintaining the public side of the barrier.
- **Security:** NB Nos. 2 through 5 would be in the same alignment as an existing wall and would not change the security conditions of the site.
- **Drainage:** NB Nos. 2 through 5 would not affect the existing and proposed drainage system.
- **Geotechnical Considerations:** NB Nos. 2 through 5 would be constructed at a similar grade to the existing condition.
- **Utility Relocations:** Construction of NB No. 2 would not have the potential to interfere with existing utilities. However, the construction of NB Nos. 3, 4, and 5 have the potential to interfere with existing utilities because there are overhead electrical lines in the area. Installation of piles during the construction of NB Nos. 3, 4, and 5 may require temporary bypass power lines to be constructed. Although utility relocations are not anticipated, further investigation would be required during the Plans, Specifications, and Estimates (PS&E) phase.

3.3. Preliminary Recommendation and Decision

The preliminary noise abatement decision presented in this report is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein may also be subject to change. If pertinent parameters change substantially during the final project design, the preliminary noise abatement decision may be changed or eliminated from the final project design. A final decision to construct noise abatement will be made by the Project Development Team (PDT) upon completion of the project design and public input.

The property owners and non-owner occupants will be sent a noise barrier survey letter during the public review period to request each owner's or occupant's opinion on whether or not they would prefer a noise barrier and what height they would prefer the barrier to be based on the range of feasible and reasonable heights listed in Table 3.1.

Chapter 4. Secondary Effects of Abatement

The secondary effects of noise abatement were considered as part of this NADR. The proposed project includes avoidance, minimization, and/or mitigation measures that lessen potential environmental effects. Noise abatement is a part of the overall project footprint, and most secondary effects would be addressed by these measures. NB Nos. 2 through 5 are feasible and reasonable and do not have any secondary effects that require additional project features or avoidance, minimization, and/or mitigation measures.

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Chapter 5. References

California Department of Transportation (Caltrans). 2011. *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects*. May. Website: http://www.dot.ca.gov/hq/env/noise/pub/ca_tnap_may2011.pdf (accessed May 2019).

LSA Associates, Inc. 2019. *Noise Study Report.* January.

———. 2018. *Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project Traffic Impact Analysis.* June.

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Appendix A. Noise Barrier Construction Cost Estimate

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Table A-1. Noise Barrier Construction Cost Estimate

Noise Barrier No.	Noise Barrier Location	Height (ft)	Approximate Length (ft)	Noise Attenuation Level (dBA)	Number of Benefited Units/Receptors	Total Reasonable Allowance	Cost of Demolition	Cost of Sound Wall	Cost of Retaining Wall	Misc Construction Costs[1,2]	Job Site Management	Traffic Control Cost	Utility Relocation[3,4]	Landscaping for Graffitti Abatement Cost (Arch %5)	Total ROW Costs (TCE)	ROW Support Costs	Mobilization (10%)	Contingency (10%)	Estimated Construction Cost (Without ROW Donation)	Reasonable?	Estimated Construction Cost (With ROW Donation)	Reasonable?
1	ROW/PL	8	169	5	1	$95,000	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	No
		10	169	7	1	$95,000	$ 8,399	$ 77,818	$ -	$ 5,000			$ 75,000	$ 3,891	$ 18,140		$ 18,825	$ 18,825	$ 225,898	No	$ 207,758	No
		12	169	8	1	$95,000	$ 8,399	$ 91,134	$ -	$ 5,000			$ 75,000	$ 4,557	$ 18,140		$ 20,223	$ 20,223	$ 242,676	No	$ 224,536	No
		14	169	9	1	$95,000	$ 8,399	$ 105,891	$ -	$ 5,000			$ 75,000	$ 5,295	$ 18,140		$ 21,773	$ 21,773	$ 261,270	No	$ 243,130	No
		16	169	10	1	$95,000	$ 8,399	$ 116,898	$ -	$ 5,000			$ 75,000	$ 5,845	$ 18,140		$ 22,928	$ 22,928	$ 275,138	No	$ 256,998	No
2	ROW/PL	8	129	6	1	$95,000	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	No
		10	129	8	1	$95,000	$ 6,411	$ 60,078	$ -					$ 3,004	$ 16,550		$ 8,604	$ 8,604	$ 103,251	No	$ 86,701	Yes
		12	129	9	1	$95,000	$ 6,411	$ 70,369	$ -					$ 3,518	$ 16,550		$ 9,685	$ 9,685	$ 116,218	No	$ 99,668	No
		14	129	10	1	$95,000	$ 6,411	$ 80,936	$ -					$ 4,047	$ 16,550		$ 10,794	$ 10,794	$ 129,533	No	$ 112,983	No
		16	129	11	1	$95,000	$ 6,411	$ 89,343	$ -					$ 4,467	$ 16,550		$ 11,677	$ 11,677	$ 140,126	No	$ 123,576	No
3	ROW/PL	8	113	6	1	$95,000	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	No
		10	113	7	1	$95,000	$ -	$ 52,757	$ -					$ 2,638	$ 17,030		$ 7,242	$ 7,242	$ 86,910	Yes	$ 69,880	Yes
		12	113	7	1	$95,000	$ -	$ 61,796	$ -					$ 3,090	$ 17,030		$ 8,192	$ 8,192	$ 98,299	No	$ 81,269	Yes
		14	113	8	1	$95,000	$ -	$ 71,235	$ -					$ 3,562	$ 17,030		$ 9,183	$ 9,183	$ 110,192	No	$ 93,162	Yes
		16	113	8	1	$95,000	$ -	$ 78,616	$ -					$ 3,931	$ 17,030		$ 9,958	$ 9,958	$ 119,492	No	$ 102,462	No
4	ROW/PL	6	171	7	2	$190,000	$ 8,499	$ 55,405	$ -	$ 8,000			$ 75,000	$ 2,770	$ 23,910		$ 17,358	$ 17,358	$ 208,301	No	$ 184,391	Yes
		8	171	10	2	$190,000	$ 8,499	$ 67,385	$ -	$ 8,000			$ 75,000	$ 3,369	$ 23,910		$ 18,616	$ 18,616	$ 223,396	No	$ 199,486	No
		10	171	12	2	$190,000	$ 8,499	$ 78,593	$ -	$ 8,000			$ 75,000	$ 3,930	$ 23,910		$ 19,793	$ 19,793	$ 237,517	No	$ 213,607	No
		12	171	14	2	$190,000	$ 8,499	$ 92,039	$ -	$ 8,000			$ 75,000	$ 4,602	$ 23,910		$ 21,205	$ 21,205	$ 254,459	No	$ 230,549	No
		14	171	15	2	$190,000	$ 8,499	$ 106,928	$ -	$ 8,000			$ 75,000	$ 5,346	$ 23,910		$ 22,768	$ 22,768	$ 273,220	No	$ 249,310	No
		16	171	16	2	$190,000	$ 8,499	$ 119,529	$ -	$ 8,000			$ 75,000	$ 5,976	$ 23,910		$ 24,091	$ 24,091	$ 289,097	No	$ 265,187	No
5	ROW	6	705	6	2	$190,000	-	-	-	-	-	-	-	-	-	-	-	-	-	No	-	No
		8	705	9	3	$285,000	$ 35,039	$ 286,317	$ -					$ 14,316	$ 48,650		$ 38,432	$ 38,432	$ 461,186	No	$ 412,536	No
		10	705	11	3	$285,000	$ 35,039	$ 333,740	$ -					$ 16,687	$ 48,650		$ 43,412	$ 43,412	$ 520,938	No	$ 472,288	No
		12	705	13	5	$475,000	$ 35,039	$ 390,997	$ -					$ 19,550	$ 48,650		$ 49,424	$ 49,424	$ 593,082	No	$ 544,432	No
		14	705	14	7	$665,000	$ 35,039	$ 451,522	$ -					$ 22,576	$ 48,650		$ 55,779	$ 55,779	$ 669,344	No	$ 620,694	Yes
		16	705	16	7	$665,000	$ 35,039	$ 505,004	$ -					$ 25,250	$ 48,650		$ 61,394	$ 61,394	$ 736,731	No	$ 688,081	No
6	ROW/PL	10	184	7	1	$95,000	$ 9,145	$ 84,752	$ -					$ 4,238	$ 10,900		$ 10,903	$ 10,903	$ 130,841	No	$ 119,941	No
		12	184	8	1	$95,000	$ 9,145	$ 99,254	$ -					$ 4,963	$ 10,900		$ 12,426	$ 12,426	$ 149,114	No	$ 138,214	No
		14	184	9	1	$95,000	$ 9,145	$ 115,074	$ -					$ 5,754	$ 10,900		$ 14,087	$ 14,087	$ 169,047	No	$ 158,147	No
		16	184	10	1	$95,000	$ 9,145	$ 128,521	$ -					$ 6,426	$ 10,900		$ 15,499	$ 15,499	$ 185,990	No	$ 175,090	No

[1] The Miscellaneous Construction Cost for NB No. 1 is to reconstruct the adjacent trash bin enclosure

[2] The Miscellaneous Construction Cost for NB No. 4 is for landscape repair to the adjacent property

[3] Utility Relocation Cost for NB No. 1 is for the relocation of a power pole with transformer.

[4] Utility Relocation Cost for NB No. 4 is for the relocation of a power pole and underground conduits.

dBA = A-weighted decibels

ft = feet

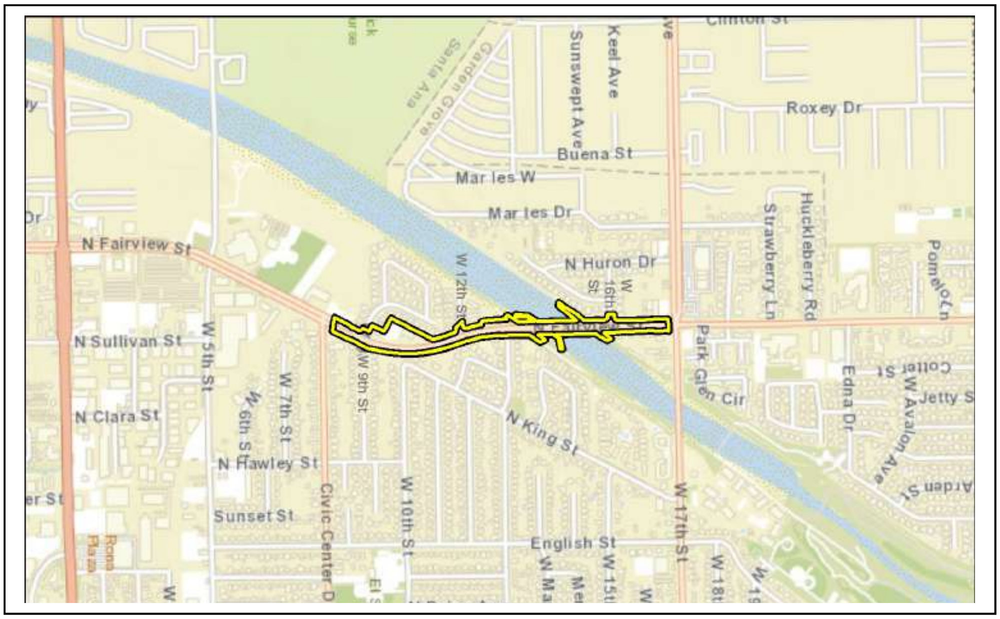
Misc = miscellaneous

PL = property line

ROW = right-of-way

APPENDIX A

Noise Study Report



Noise Study Report

Santa Ana, California

Federal Project No. BRLS 5063(184)

January 2019

CALIFORNIA DEPARTMENT OF TRANSPORTATION

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Noise Study Report

Fairview Street Improvements from 9th Street to 16th Street

and Bridge Replacement Project

Santa Ana, California

Federal Project No. BRLS 5063(184)

January 2018

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Summary

The City of Santa Ana (City), in conjunction with the California Department of Transportation (Caltrans), District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed Project) in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction, which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

A Type 1 project, as defined by Title 23, Part 772, of the Code of Federal Regulations (23 CFR 772), is any proposed Federal or Federal-aid highway project for the construction of a highway on new location, the physical alteration of an existing highway where there is either substantial horizontal or vertical alignment alteration, or other activities listed as a Type 1 project. The proposed Project is considered a Type 1 project because one additional travel lane in each direction would be added on Fairview Street. A noise analysis is required for all Type 1 projects.

Existing land uses in the project area include single-family and multifamily residences, a medical office, a park (Fairview Triangle Habitat Restoration Park), a multi-use trail, vacant land, and office, commercial, and light industrial uses. The primary source of noise in the project area is traffic on Fairview Street.

The terrain in the project area can be separated into four areas:

- Land uses east of Fairview Street and south of the Santa Ana River include single-family and multifamily residences, vacant land, and commercial uses that range from 3 feet (ft) higher to 7 ft lower in elevation than Fairview Street.

- Land uses west of Fairview Street and south of the Santa Ana River include single-family and multifamily residences, a medical office, a park, a trail, and office uses that range from 2 ft higher to 5 ft lower in elevation than Fairview Street.
- Land uses east of Fairview Street and north of the Santa Ana River include single-family residences and commercial and light industrial uses that range from 2 ft higher in elevation than Fairview Street to approximately the same elevation as Fairview Street.
- Land uses west of Fairview Street and north of the Santa Ana River include single-family residences, vacant land, and commercial and light industrial uses that range from 2 ft higher to 9 ft lower in elevation than Fairview Street.

Fifteen short-term noise level measurements were conducted at representative locations to document the existing noise environment. All short-term noise level measurements were used to calibrate the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) 2.5 (2004) with concurrent traffic counts and observed vehicle speeds to ensure the accuracy of TNM 2.5. A total of 92 representative existing receptors were modeled and evaluated for potential noise impacts resulting from traffic noise. The results of the modeled noise levels for Existing, Future No Build, and Future Build conditions are provided in Table B.1 in Appendix B.

Two long-term (24-hour) noise level measurements were conducted in the project area to characterize the change in hourly noise levels over the course of a 24-hour period in the project area and to identify the peak traffic noise hour.

When traffic noise impacts have been identified, noise abatement measures must be considered. Traffic noise impacts result from one or more of the following occurrences: (1) an increase of 12 A-weighted decibels (dBA) or more over the corresponding existing noise levels, or (2) predicted noise levels approaching or exceeding the Noise Abatement Criteria (NAC).

Implementation of the proposed Project would result in potential short-term noise impacts during construction and long-term operational noise impacts from use of the completed project. Of the 92 modeled receptors, nine receptors would approach or exceed the NAC. No modeled receptors would experience a substantial increase of 12 dBA or more over their corresponding modeled existing noise levels.

Noise abatement measures were evaluated for receptors within the project limits that would be or would continue to be exposed to traffic noise levels approaching or exceeding the NAC. Six noise barriers were evaluated. The results of the noise barrier modeling are shown in Table B.1 in Appendix B. All six noise barriers were capable of reducing noise levels by 5 dBA or more, as required to be considered feasible.

A Noise Abatement Decision Report (NADR) will be prepared for the proposed Project. The NADR is a design responsibility and is prepared to compile information from the Noise Study Report (NSR), other relevant environmental studies, and design considerations into a single, comprehensive document before public review of the proposed Project. The NADR is prepared after completion of the NSR and prior to publication of the draft environmental document. The NADR includes noise abatement construction cost estimates that have been prepared and signed by the project engineer based on site-specific conditions. Construction cost estimates are compared to reasonable allowances in the NADR to identify which noise barrier configurations are reasonable from a cost perspective. The reasonableness determination of the feasible noise barriers shown in Tables 7.1 through 7.6 will be reported in the NADR for the proposed Project.

The design of noise barriers presented in this report is preliminary and has been conducted at a level appropriate for environmental review and not for final design of the proposed Project. If pertinent parameters change substantially during the final project design, preliminary noise barrier designs may be modified or eliminated from the final project. A final decision on the construction of the noise abatement will be made upon completion of the public involvement process during the final project design process.

The closest residences are located approximately 50 ft from the project construction areas. Therefore, the closest residences may be subject to short-term noise reaching 88 dBA maximum instantaneous noise level (L_{max}) or higher generated by construction activities in the project area. Compliance with the Caltrans Standard Specifications, Section 14-8.02, and the City’s Municipal Code, Section 18-314, will be required to minimize construction noise impacts on land uses adjacent to the project area. In compliance with these regulations, the contractor shall not perform any construction activities between the hours of 8:00 p.m. and 7:00 a.m. on weekdays and Saturdays, or at any time on Sundays and federal holidays.

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List of Abbreviated Terms

°F	degrees Fahrenheit
μPa	micropascals
23 CFR 772	Title 23, Part 772 of the Code of Federal Regulations
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Santa Ana
CNEL	Community Noise Equivalent Level
dB	decibel(s)
dBA	A-weighted decibel(s)
dBA L_{eq}	equivalent continuous sound level measured in A-weighted decibels
FHWA	Federal Highway Administration
ft	foot/feet
Hz	Hertz
I.L.	Insertion Loss
kHz	kilohertz
L_{10}	noise level exceeded 10 percent of the time during a stated period
L_{90}	noise level exceeded 90 percent of the time during a stated period
L_{dn}	day-night level
L_{eq}	equivalent continuous sound level
L_{eq}(h)	1-hour A-weighted equivalent continuous sound level
L_{max}	maximum instantaneous sound level
L_{xx}	percentile-exceeded sound level
mph	miles per hour
NAC	Noise Abatement Criteria
NADR	Noise Abatement Decision Report

NB	Noise Barrier
NEPA	National Environmental Policy Act
NSR	Noise Study Report
proposed Project	Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project
Protocol	Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects
RCNM	Roadway Construction Noise Model
SPL	sound pressure level
TeNS	Caltrans *Technical Noise Supplement*
TNM	Traffic Noise Model
vplph	vehicles per lane per hour

Chapter 1. Introduction

The City of Santa Ana (City), in conjunction with the California Department of Transportation (Caltrans) District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed Project) in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

Within the project limits, Fairview Street is bordered by single-family residences and a few commercial properties.

1.1. Purpose of the Noise Study Report

The purpose of Title 23, Part 772, of the Code of Federal Regulations (23 CFR 772), "Procedures for Abatement of Highway Traffic Noise and Construction Noise," (1982) is to provide procedures to help protect public health and welfare, supply Noise Abatement Criteria (NAC), and establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to 23 CFR 772.1. As such, 23 CFR 772 provides procedures for preparing operational and construction noise impact studies and evaluating noise abatement considered for federal and federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with Federal Highway Administration (FHWA) noise standards.

The Caltrans *Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects* (Protocol) (Caltrans 2011) provides Caltrans policy for implementing 23 CFR 772 in California. The Protocol outlines the requirements for preparing Noise Study Reports (NSRs). The purpose of this NSR is to evaluate noise impacts and noise abatement consistent with the requirements of 23 CFR 772.

1.2. Project Purpose and Need

The Project Area has a history of traffic congestion; however, the proposed Project would improve traffic flow and alleviate congestion in this area. The proposed Project would also increase pedestrian safety at Fairview Street bridge by constructing new barrier rails, sidewalks, bicycle lanes, a raised median, and lighting on the proposed bridge structure.

1.2.1. Project Purpose

The purpose of the proposed Project is to improve pedestrian/bicyclist safety and traffic flow on and in the vicinity of Fairview Street bridge. The following goals/ objectives have been identified for the proposed Project:

- Provide for adequate vehicular capacity and greater pedestrian and bike safety on Fairview Street bridge; and
- Make the Fairview Street bridge design and capacity consistent with the Orange County Master Plan of Arterial Highways and the City of Santa Ana General Plan Circulation Element.

1.2.2. Project Need

The existing Fairview Street bridge has insufficient safety barriers and capacity to handle existing and projected traffic levels in the Project Area and is operating with the following deficiencies within the Project limits:

- No sidewalks, bike lanes, center median or barrier, or lighting; and
- Congestion on and around the existing bridge due to high traffic demands and a limited number of lanes relative to areas north and south of the bridge.

Chapter 2. Project Description

The City, in conjunction with Caltrans District 12, proposes to replace the Fairview Street bridge over the Santa Ana River and widen Fairview Street between 9th Street and 16th Street in Santa Ana, California. The City is the lead agency under the California Environmental Quality Act (CEQA). Caltrans is the lead agency under the National Environmental Policy Act (NEPA), as assigned by the FHWA through NEPA Delegation.

This section describes the proposed Project and the alternatives that were developed to meet the identified purpose and need of the proposed Project while avoiding or minimizing environmental impacts. The two alternatives being evaluated are the No Build Alternative and the Build Alternative.

2.1. No Build Alternative

The No Build Alternative assumes that no improvements are made to Fairview Street. The No Build Alternative would maintain the existing conditions and provides a baseline for comparison of the impacts under the Build Alternative. Under the No Build Alternative, the performance of the roadway would continue to deteriorate with the forecasted increase in traffic.

2.2. Build Alternative

The proposed Project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River. The proposed Project would widen Fairview Street from two lanes in each direction to three lanes in each direction, as shown in Figures 2-1 and 2-2. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

The proposed bridge would be expanded from approximately 52 feet (ft) to 100 ft in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

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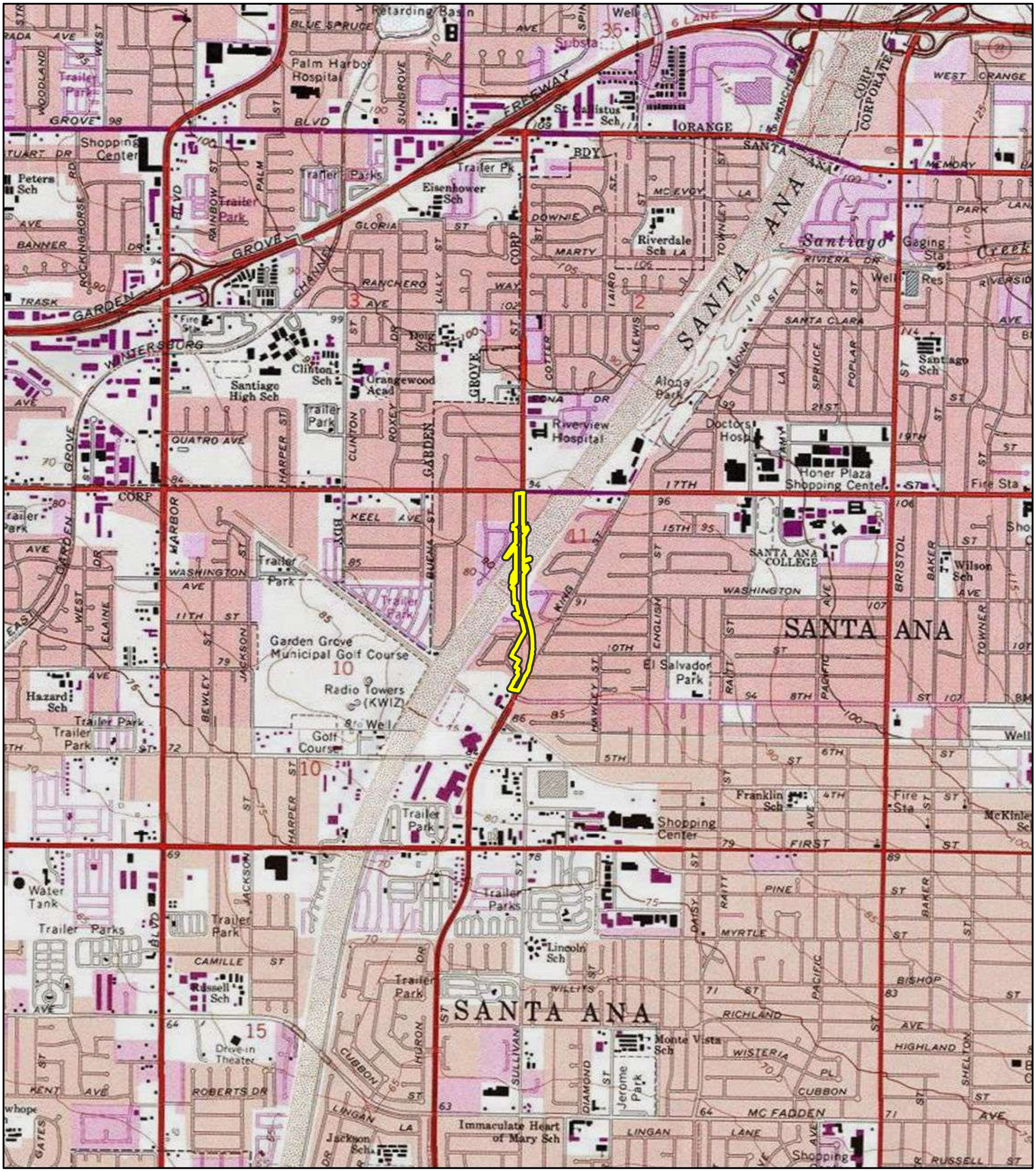

FIGURE 2-1

LEGEND

Project Location

N

0 1000 2000

FEET

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Regional Location and Project Area

SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

Federal Project No.: BRLS 5063(184)

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LEGEND

- Project Area
- Proposed Right of Way
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- Proposed Construction Access

0 100 200
FEET

SOURCE: WKE (3/2018); Google (2016)

FIGURE 2-2

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Proposed Project

Federal Project No.: BRLS 5063(184)

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The proposed Project would partial acquire right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APNs) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]), as shown in Figure 2-2.

An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. These utilities would need to be temporarily relocated during construction and then permanently relocated to the new bridge.

Water quality best management practices (BMPs) would be included to treat stormwater runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bikes would be detoured away from the Fairview Street bridge to the 17th Street Bridge to cross the Santa Ana River by way of the Santa Ana River Trail (SART) between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists who wish to cross the Santa Ana River would be detoured to adjacent City streets such as King Street.

Construction of the proposed Project would require temporary closure of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of the SART affected by project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detours are being coordinated with Orange County Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the river bed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the river bed.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the Project Area .All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to pre-construction conditions or better prior to project completion.

Chapter 3. Fundamentals of Traffic Noise

The following is a brief discussion of fundamental traffic noise concepts. For a detailed discussion, refer to the Caltrans *Technical Noise Supplement* (TeNS), a technical supplement to the Protocol that is available on the Caltrans website (Caltrans 2013).

3.1. Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ (e.g., a human ear). Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receptor, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receptor determine the sound level and characteristics of the noise perceived by the receptor. The field of acoustics deals primarily with the propagation and control of sound.

3.2. Frequency and Hertz

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

3.3. Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micropascals (μPa). One μPa is approximately one hundred billionths (0.00000000001) of the normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 μPa. Because of this huge range of values, sound is rarely expressed in terms of μPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB).

The threshold of hearing for young people is approximately 0 dB, which corresponds to 20 μPa.

3.4. Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sounds of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB, a difference of 3 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

3.5. A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit of area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds in that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. An “A-weighted” sound level (expressed in units of A-weighted decibels [dBA]) can then be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments regarding the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B, C, and D scales), but these scales are rarely used in conjunction with highway traffic noise. Noise levels for traffic noise reports are typically reported in terms of dBA. Table 3.1 shows typical A-weighted noise levels.

Table 3.1. Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet flyover at 1,000 ft		
	— 100 —	
Gas lawnmower at 3 ft		
	— 90 —	
Diesel truck at 50 ft at 50 mph		Food blender at 3 ft
	— 80 —	Garbage disposal at 3 ft
Noisy urban area, daytime		
Gas lawnmower, 100 ft	— 70 —	Vacuum cleaner at 10 ft
Commercial area		Normal speech at 3 ft
Heavy traffic at 300 ft	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher in next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: California Department of Transportation, *Technical Noise Supplement*, Table 2-5 (September 2013).
dBA = A-weighted decibel(s)
ft = foot/feet
mph = miles per hour

3.6. Human Response to Changes in Noise Levels

As discussed previously, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the midfrequency range (1,000–8,000 Hz).
In typical noisy environments, 1–2 dB changes in noise are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy

(e.g., doubling the volume of traffic on a highway) that would result in a 3 dB increase in sound would generally be perceived as barely detectable.

3.7. Noise Descriptors

Noise in the daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others fluctuate slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis:

- **Equivalent Continuous Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period of time. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent continuous sound level (L_{eq}[h]) is the energy average of A-weighted sound levels occurring during a 1-hour period and is the basis for the NAC used by Caltrans and the FHWA.
- **Percentile-Exceeded Sound Level (L_{xx}):** L_{xx} represents the sound level exceeded for a given percentage of a specified period of time (e.g., L_{10} is the sound level exceeded 10 percent of the time and L_{90} is the sound level exceeded 90 percent of the time).
- **Maximum Instantaneous Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10:00 p.m. and 7:00 a.m.
- **Community Noise Equivalent Level (CNEL):** Similar to L_{dn}, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10:00 p.m. and 7:00 a.m., and a 5 dB penalty applied to the A-weighted sound levels occurring during the evening hours between 7:00 p.m. and 10:00 p.m.

3.8. Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the factors described below.

3.8.1. Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

3.8.2. Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor [e.g., a parking lot or body of water]), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., sites with an absorptive ground surface between the source and the receptor [e.g., soft dirt, grass, or scattered bushes and trees]), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance.

3.8.3. Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 ft) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors (e.g., air temperature, humidity, and turbulence) can also have significant effects.

3.8.4. Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor specifically to reduce noise. A barrier that breaks the line of sight between a source and a receptor will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction. Vegetation between a highway and a receptor is rarely effective in reducing noise because it does not create a solid barrier.

Chapter 4. Federal, State, and Local Policies and Procedures

This report focuses on the requirements of 23 CFR 772, as discussed in this chapter.

4.1. Federal Regulations

4.1.1. 23 CFR 772

23 CFR 772 provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under 23 CFR 772.7, projects are categorized as Type 1, Type 2, or Type 3 projects.

The FHWA defines a Type 1 project as a proposed federal or federal-aid highway project for the construction of a highway on a new location or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment of the highway. The following projects are also considered Type 1 projects:

- The addition of a through-traffic lane or lanes. This includes the addition of a through-traffic lane that functions as a high-occupancy vehicle lane, high-occupancy toll lane, bus lane, or truck climbing lane.
- The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane.
- The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange.
- Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane.
- The addition of a new or substantial alteration of an existing weigh station, rest stop, ride-share lot, or toll plaza.

If a project is determined to be a Type 1 project under this definition, the entire project area as defined in the environmental document is a Type 1 project. A Type 2 project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. A Type 3 project is a project that does not meet the classifications of a Type 1 or Type 2 project. Type 3 projects do not require a noise analysis.

Under 23 CFR 772.11, noise abatement must be considered for Type 1 projects if the project is predicted to result in a traffic noise impact. In such cases, 23 CFR 772 requires that the project sponsor "consider" noise abatement before adoption of the final NEPA document. This process involves identification of noise abatement measures that are reasonable, feasible, and likely to be incorporated into the project, and of noise impacts for which no apparent solution is available.

Traffic noise impacts, as defined in 23 CFR 772.5, occur when the predicted noise level in the design year approaches or exceeds the NAC specified in 23 CFR 772, or a predicted noise level substantially exceeds the existing noise level (i.e., a "substantial" noise increase). The terms "substantial increase" or "approach" are not specifically defined in 23 CFR 772; these criteria are defined in the Protocol, as described in the following section.

Table 4.1 summarizes the NAC corresponding to various land use activity categories. Activity categories and related traffic noise impacts are determined based on the actual land use in a given area.

Table 4.1. Activity Categories and Noise Abatement Criteria

Activity Category	Activity Leq(h)1	Evaluation Location	Description of Activities
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance, that 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[2]	67	Exterior	Residential.
C[2]	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	—	—	Agriculture, airports, bus yards, emergency services, industrial uses, logging, maintenance facilities, manufacturing, mining, railyards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	—	—	Undeveloped lands that are not permitted.

Source: California Department of Transportation, *Traffic Noise Analysis Protocol*, Table 1 (May 2011).

[1] The L_{eq}(h) activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are in dBA.

[2] Includes undeveloped lands permitted for this activity category.

dBA = A-weighted decibel(s)

L_{eq}(h) = equivalent continuous sound level per hour

4.1.2. Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

The Caltrans Protocol specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction of federal or federal-aid highway projects. The NAC specified in the Protocol are the same as those specified in 23 CFR 772. The Protocol defines a noise increase as “substantial” when the predicted noise levels under build conditions exceed existing noise levels by 12 dBA. The Protocol also states that a sound level is considered to approach an NAC level when the sound level is within 1 dB of the NAC identified in 23 CFR 772 (e.g., 66 dBA is considered to approach the NAC of 67 dBA, but 65 dBA is not).

The Caltrans TeNS (September 2013) and the Protocol provide detailed technical guidance for the evaluation of highway traffic noise. This includes field measurement methods, noise modeling methods, and report preparation guidance.

4.2. State Regulations and Policies

4.2.1. California Environmental Quality Act

Noise analysis under CEQA may be required regardless of whether the proposed Project is a Type 1 project. The CEQA noise analysis is completely independent of the 23 CFR 772 analysis done for NEPA. Under CEQA, the baseline noise level is compared to the build noise level. The assessment entails looking at the existing setting and how large or perceptible any noise increase would be in a given area. Key considerations include the uniqueness of the setting, the sensitive nature of the noise receptors, the magnitude of the noise increase, the number of residences affected, and the absolute noise level.

The significance of noise impacts under CEQA are addressed in the environmental document rather than in the NSR. Even though the NSR (or noise technical memorandum) does not specifically evaluate the significance of noise impacts under CEQA, it must contain the technical information that is needed to make that determination in the environmental document.

4.2.2. Section 216 of the California Streets and Highways Code

Section 216 of the California Streets and Highways Code relates to the noise effects of a proposed freeway project on public and private elementary and secondary schools. Under this code, a noise impact occurs if, as a result of a proposed freeway project, noise levels exceed 52 dBA L_{eq}(h) in the interior of public or private elementary or secondary school classrooms, libraries, multipurpose rooms, or spaces.

This requirement does not replace the “approach or exceed” NAC criterion for FHWA Activity Category D for classroom interiors, but it is a requirement that must be addressed in addition to the requirements of 23 CFR 772.

If a project results in a noise impact under this code, noise abatement must be provided to reduce classroom noise to a level that is at or below 52 dBA L_{eq}(h). If the noise levels generated from freeway and nonfreeway sources exceed 52 dBA L_{eq}(h) prior to construction of the proposed freeway project, noise abatement must be provided to reduce noise to the level that existed prior to project construction.

4.3. Local Regulations and Policies

4.3.1. City of Santa Ana

Section 18-314 of the City’s Municipal Code prohibits the construction, repair, remodeling, or grading of any real property except between the hours of 7:00 a.m. and 8:00 p.m. on weekdays and Saturdays. No such work is permitted on Sundays and federal holidays.

Chapter 5. Study Methods and Procedures

5.1. Methods for Identifying Land Uses and Selecting Noise Measurement and Modeling Receptor Locations

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed Project. Land uses in the project area were categorized by land use type, activity category (as defined in Table 4.1), and frequency of human use. An area of frequent human use is an area where people are exposed to traffic noise for an extended period of time on a regular basis. One practical test for determining frequent human use is the presence of existing facilities that invite human use such as benches, barbeque facilities, covered group picnic areas, and uncovered picnic tables. As stated in the Protocol, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this noise impact analysis focuses on locations with defined outdoor activity areas (e.g., residential backyards, parks, and sitting areas).

The topographical features of the project area relative to nearby existing and planned land uses, such as hills and changes in terrain, were also identified.

Fifteen short-term measurement locations were selected to represent noise-sensitive land uses in the project area. Two long-term measurement sites were selected to capture the diurnal traffic noise level pattern in the project area. Short-term measurement locations were selected to serve as representative modeling locations. Also, other nonmeasurement locations were selected as modeling locations. A total of 92 receptor locations were modeled to represent land uses in the project area. These monitoring and modeled receptor locations are shown on Figure 5-1.

5.2. Field Measurement Procedures

A field noise study was conducted in accordance with the recommended procedures in the Caltrans TeNS (2013). The following is a summary of the procedures used to collect short-term and long-term sound level data.

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LEGEND

- Short-Term Monitoring Locations
- Long-Term Monitoring Locations
- Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls

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FEET

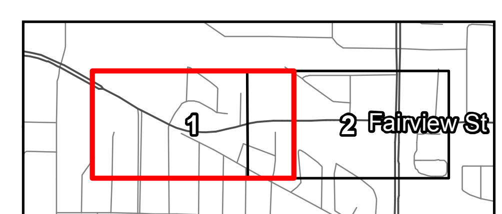

FIGURE 5-1

Sheet 1 of 2

Fairview Street Improvements

from 9th Street to 16th Street and Bridge Replacement Project

Monitoring and Modeled Receptor Locations

Federal Project No.: BRLS 5063(184)

SOURCE: Google Aerial (12/2017); WKE (2017)

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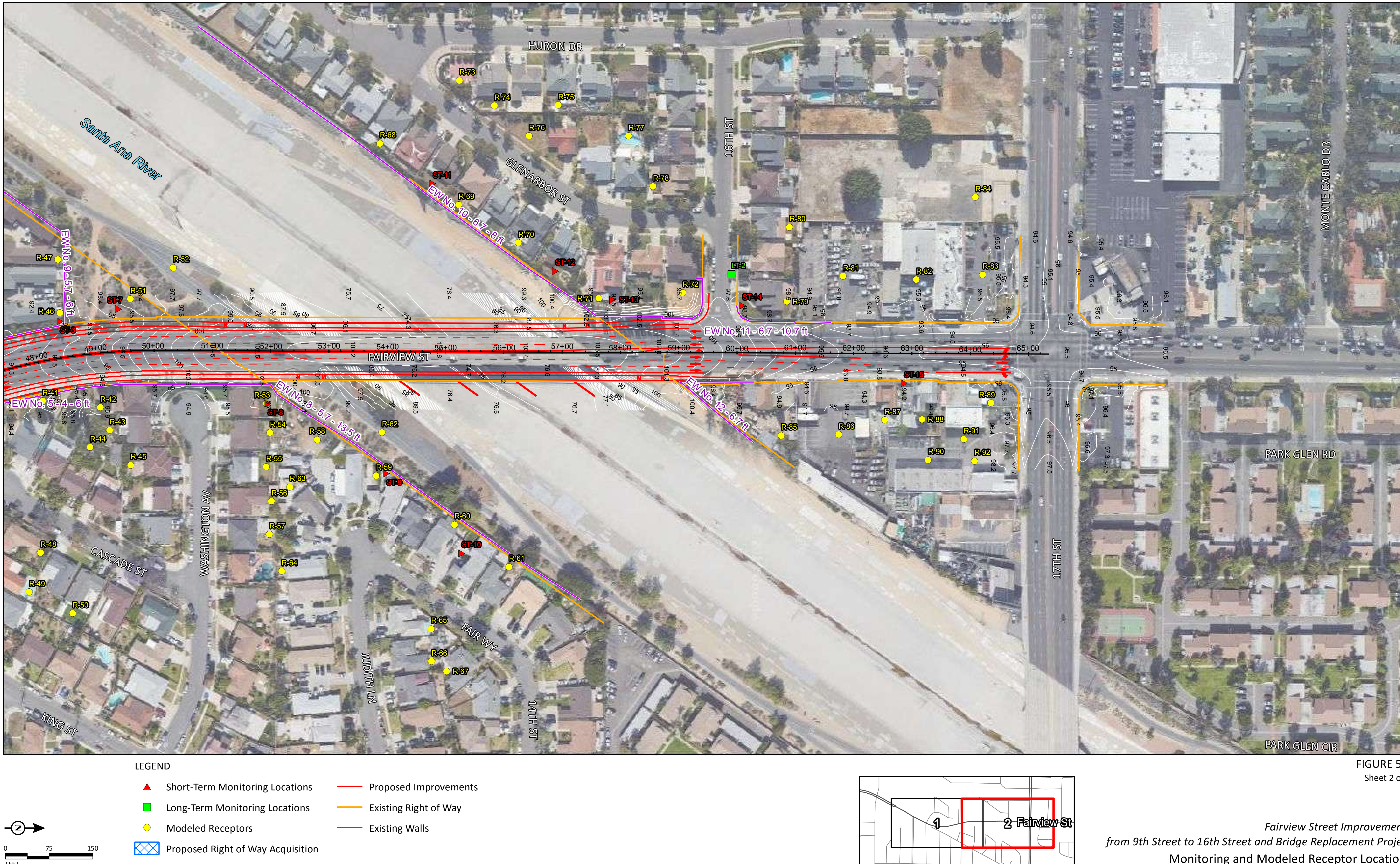

SOURCE: Google Aerial (12/2017); WKE (2017)

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FIGURE 5-1

Sheet 2 of 2

Fairview Street Improvements

from 9th Street to 16th Street and Bridge Replacement Project

Monitoring and Modeled Receptor Locations

Federal Project No.: BRLS 5063(184)

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5.2.1. Short-Term Measurements

Short-term noise level measurements in the project vicinity were sampled during off-peak traffic hours when traffic was flowing freely. Short-term noise level measurements were made using Larson Davis Model 831, 824, and 820 Type 1 sound level meters.

The following measurement procedures were used:

- Calibrate the sound level meter.
- Set up the sound level meter at a height of 5 ft.
- Commence noise monitoring.
- Collect site-specific data (e.g., date, time, direction of traffic, vehicle speed, and location of the sound level meter relative to any existing feature).
- Count passing vehicles for a period of 20 minutes during noise level measurement. Vehicles are split into three categories: automobiles, medium trucks, and heavy trucks.
- Stop measurement after 20 minutes.
- Calibrate the sound level meter.
- Proceed to the next monitoring site and repeat.

The traffic counts were expanded to hourly volumes (multiplied by three to normalize the results to hourly values) and entered into the FHWA Traffic Noise Model (TNM) 2.5 (2004) for each monitoring site. The monitoring results were used to calibrate the model outputs.

5.2.2. Long-Term Measurements

Two long-term noise level measurements were conducted using one dosimeter in the study area. The purpose of the long-term measurements was to identify variations in sound levels throughout the day.

5.3. Traffic Noise Level Prediction Methods

Traffic noise levels were predicted using the FHWA's TNM 2.5 (FHWA 2004). TNM 2.5 is a computer model based on two FHWA reports: FHWA-PD-96-009 and FHWA PD-96-010 (FHWA 1998a, 1998b). Key inputs to TNM 2.5 were the locations of roadways, traffic mix, vehicle speeds, shielding features (e.g., topography and buildings), noise barriers, ground type, and receptors.

The existing and future 2040 traffic (design year) noise levels at all 92 receptor locations were modeled using either the worst-case traffic operations (prior to speed degradation) or peak-hour traffic volumes, whichever were lower. The worst-case traffic condition is assumed to be level of service C and is generally loudest when vehicles on a given roadway travel at free-flowing traffic conditions. Accordingly, the 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. The worst-case traffic condition is assumed to be 750 vehicles per lane per hour (vplph) on Fairview Street and other local roadways. The a.m. peak-hour traffic volume was selected over the p.m. peak-hour traffic volume because the worst-hour noise levels based on the long-term (24-hour) noise level measurements occur during the a.m. hour. The a.m. and p.m. peak-hour traffic volumes were obtained from the *Traffic Impact Analysis* (LSA 2018). A summary of traffic data inputs for existing and future conditions is provided in Appendix A.

TNM 2.5 is sensitive to the volume of trucks on the roadway because trucks contribute disproportionally to traffic noise. Vehicle distributions on Fairview Street were obtained from traffic counts collected during ambient noise level measurement. Vehicle distribution on other local roadways in the project area was assumed to be similar to Fairview Street. Table 5.1 shows the vehicle distribution and vehicle speeds for each vehicle category in the project area used to calculate existing and future traffic noise levels.

Table 5.1. Vehicle Distribution

Roadway	Vehicle Distribution (%)			Vehicle Speed (mph)		
	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
Fairview Street and all other local roadways	95	4	1	45	45	45

Source: Compiled by LSA (May 2018).
mph = miles per hour

5.4. Methods for Identifying Traffic Noise Impacts and Consideration of Abatement

Traffic noise impacts are considered to occur at receptor locations where predicted design-year noise levels are at least 12 dBA greater than existing noise levels, or where predicted design-year noise levels approach or exceed the NAC for the applicable activity category. Where traffic noise impacts are identified, noise abatement must be considered for reasonableness and feasibility as required by 23 CFR 772 and the Protocol.

According to the Protocol, an abatement measure is considered acoustically feasible if a minimum noise reduction of 5 dBA at impacted receptor locations is predicted with implementation of the abatement measure. In addition, barriers should be designed to intercept the line of sight from the exhaust stack of a truck to the first tier of receptors as required by the Caltrans *Highway Design Manual* (2015), Chapter 1100. Other factors that affect feasibility include topography, access requirements for driveways and ramps, presence of local cross-streets, utility conflicts, other noise sources in the area, and safety considerations. The overall reasonableness of noise abatement is determined by considering factors such as the construction cost of the barrier, the noise reduction design goal (a noise level reduction of 7 dBA or more at one or more benefited receptors), and the viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

The Protocol defines the procedure for assessing the reasonableness of noise barriers from a cost perspective. A cost allowance per residence is assigned to each benefited residence (i.e., residences that receive at least 5 dBA of noise reduction from a noise barrier). The 2018 allowance is $95,000 per benefited residence. Total allowances are calculated by multiplying the cost allowance per residence by the number of benefited residences.

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Chapter 6. Existing Noise Environment

6.1. Existing Land Uses

Developed and undeveloped land uses in the project vicinity were identified through land use maps, aerial photography, and site inspection. Receptors were identified in each land use category. Existing land uses in the project area include single-family and multifamily residences, a medical office, a park (Fairview Triangle Habitat Restoration Park), a multi-use trail, vacant land, and commercial and light industrial uses. Existing land uses in the project area and surrounding vicinity are described in further detail as follows:

- **East of Fairview Street and South of the Santa Ana River (Receptors R-2 through R-7, R-11, R-12, R-13, R-17, R-18, R-24 through R-30, R-37 through R-45, R-48 through R-50, and R-53 through R-67):** Land uses in this area include single-family and multifamily residences, commercial uses, and vacant land. Land uses in this area range from 3 ft higher in elevation than Fairview Street to 7 ft lower in elevation than Fairview Street. Currently, 4 ft to 13.5 ft high existing walls along the private property lines shield the single-family residences. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The commercial uses and vacant land were evaluated under Activity Categories E and F, respectively, for reporting purposes.
- **West of Fairview Street and South of the Santa Ana River (Receptors R-1, R-8 through R-10, R-14, R-15, R-16, R-19 through R-23, R-31 through R-36, R-46, R-47, R-51, and R-52):** Land uses in this area include single-family and multifamily residences, a medical office, a park, a multi-use trail, and office uses. Land uses in this area range from 2 ft higher in elevation than Fairview Street to 5 ft lower in elevation than Fairview Street. Currently, 2.7 ft to 9.3 ft high existing walls along the private property lines shield the single-family and multifamily residences. The single-family and multifamily residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The park at the southwest corner of Fairview Street and the Santa Ana River was evaluated under Activity Category C, which has an exterior NAC of 67 dBA L_{eq}. The multi-use trail has no outdoor frequent human use areas and was classified under Activity Category C for reporting purposes. The office uses with no outdoor frequent human use areas were classified under Activity Category E for reporting purposes.

- **East of Fairview Street and North of the Santa Ana River (Receptors R-85 through R-92):** Land uses in this area include single-family residences and commercial and light industrial uses. Land uses in this area range from 2 ft higher in elevation than Fairview Street to approximately the same in elevation as Fairview Street. Currently, a 6.7 ft high existing wall along the private property line shields the commercial use. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The commercial and light industrial uses were classified under Activity Categories E and F, respectively, for reporting purposes.
- **West of Fairview Street and North of the Santa Ana River (Receptors R-68 through R-84):** Land uses in this area include single-family residences, vacant land, and commercial and light industrial uses. Land uses in this area range from 2 ft higher in elevation than Fairview Street to 9 ft lower in elevation than Fairview Street. Currently, 6.7 ft to 10.7 ft high existing walls along the private property lines shield the single-family residences. The single-family residences were evaluated under Activity Category B, which has an exterior NAC of 67 dBA L_{eq}. The commercial uses with no outdoor frequent human use areas were evaluated under Activity Category E for reporting purposes. The vacant land and light industrial uses were classified under Activity Category F for reporting purposes.

6.2. Noise Measurement Results

The existing noise environment in the project area is based on short-term (20-minute) and long-term (24-hour) noise level measurements.

6.2.1. Short-Term Monitoring

The primary source of noise in the project area is vehicular traffic on Fairview Street. Short-term (20-minute) noise measurements were conducted to document existing noise levels at 15 representative receptor locations in the project area. Short-term noise level measurements were conducted using Larson Davis Models 831, 824, and 820 Type 1 sound level meters. Table 6.1 contains the results of the short-term noise level measurements along with a description of the physical location of each monitoring site. These short-term noise measurements were used to calibrate the noise model and to predict the noise levels at all 92 modeled receptors in the project area. The short-term monitoring locations are shown on Figure 5-1. The concurrent traffic counts and observed vehicle speeds are provided in Appendix A. The noise monitoring results for each monitoring site are included in Appendix C.

Table 6.1. Short-Term Ambient Noise Monitoring Results

Monitor No.	Date	Start Time	Duration	dBA L_{eq}	Traffic Counts: Automobiles[1]	Traffic Counts: Medium Trucks	Traffic Counts: Heavy Trucks	Observed Speed (mph)	Location Description	Noise Sources	Comments
ST-1	4/17/2018	9:23 a.m.	20 minutes	63.4	280/340	10/19	6/5	45/45	2234 West 9th Street. In the residence backyard.	Traffic on Fairview Street, birds, and rooster crowing.	Residence wall is about 4.7 ft high.
ST-2	4/17/2018	9:23 a.m.	20 minutes	63.8	280/340	10/19	6/5	45/45	2507 9th Street. In the residence backyard.	Traffic on Fairview Street.	Back wall is about 5.3 ft high. Side wall is about 5 ft high.
ST-3	4/17/2018	9:23 a.m.	20 minutes	64.9	280/340	10/19	6/5	45/45	1908 King Street. In the residence backyard.	Traffic on Fairview Street and birds.	Northern neighbor wall is about 4 ft high.
ST-4	4/17/2018	10:28 a.m.	20 minutes	67.3	305/313	11/12	4/6	45/45	1007 Marengo Place. In the residence backyard.	Traffic on Fairview Street and birds.	Wood slat fence is about 6 ft high.
ST-5	4/17/2018	10:28 a.m.	20 minutes	65.6	305/313	11/12	4/6	45/45	2332 West 12th Street. In the residence backyard.	Traffic on Fairview Street.	Residence wall is about 5.5 ft high.
ST-6	4/17/2018	11:36 a.m.	20 minutes	64.7	313307	5/8	6/3	45/45	2503 West 12th Street. In the residence backyard.	Traffic on Fairview Street.	Side wall is about 6 ft high. Back wall is about 5.7 ft high.
ST-7	5/10/2018	11:10 a.m.	20 minutes	66.7	473/361	14/14	4/3	45/45	In Fairview Triangle Habitat Restoration Park.	Traffic on Fairview Street, birds, and wind.	None.
ST-8	4/17/2018	10:28 a.m.	20 minutes	56.7	305/313	11/12	4/6	45/45	2413 West Washington Avenue. In the residence backyard.	Traffic on Fairview Street.	North wall is about 5.7 ft high. West wall is about 8.7 ft high.
ST-9	4/17/2018	1:53 p.m.	20 minutes	55.7	359/326	17/9	3/3	45/45	1322 Fair Way. In the residence backyard.	Traffic on Fairview Street.	Back wall is about 5.7 ft high. South wall is about 5.7 ft high.
ST-10	4/17/2018	1:54 p.m.	20 minutes	53.3	359/326	17/9	3/3	45/45	1334 Fair Way. In the residence backyard.	Traffic on Fairview Street.	Outer wall is about 5.3 ft high. Inner wall is about 6 ft high.
ST-11	4/17/2018	12:19 p.m.	20 minutes	50.0	377/378 272/260	33/15 8/3	6/2 4/3	45/45 45/45	1321 North Glenarbor Street. In the residence backyard.	Traffic on Fairview Street.	Back wall is about 6.7 ft high. Northern wall is about 5.7 ft high.
ST-12	4/17/2018	12:19 p.m.	20 minutes	54.5	377/378 272/260	33/15 8/3	6/2 4/3	45/45 45/45	1413 North Glenarbor Street. In the residence backyard.	Traffic on Fairview Street.	Eastern wall is about 7.2 ft high. Northern wall is about 6 ft high. Southern wall is about 6.7 ft high.
ST-13	4/17/2018	1:12 p.m.	20 minutes	55.7	300/280 280/310	8/7 2/4	2/10 3/4	45/45 45/45	1417 North Glenarbor Street. In the residence backyard.	Traffic on Fairview Street.	Back wall is about 7 ft high. Northern wall is about 5.3 ft high. Southern wall is about 4.7 ft high.
ST-14	5/10/2018	12:10 p.m.	20 minutes	63.0	270/320	11/6	3/7	45/45	2501 16th Street. In the residence front yard.	Traffic on Fairview Street and light traffic on 16th Street.	Residence wall is about 6.4 ft high.
ST-15	4/17/2018	1:12 p.m.	20 minutes	74.0	300/280 280/310	8/7 2/4	2/10 3/4	45/45 45/45	South of 1609 Fairview Street. In the residence front yard.	Traffic on Fairview Street.	None.

Source: Compiled by LSA (May 2018).
[1] Traffic volumes and observed speeds are for Fairview Street northbound/southbound. For ST-11, ST-12, ST-13, and ST-15, traffic volumes and observed speeds on 17th Street eastbound/westbound are shown below the Fairview Street traffic volumes and observed speeds.
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels
ft = foot/feet
mph = miles per hour
ST = short-term

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Table 6.2. Meteorological Conditions During Noise Monitoring

Date	Temperature (°F)	Average Wind Speed (mph)	Relative Humidity (%)
4/17/2018	58.0–78.8	2.4–6.4	23.1–77.5
5/10/2018	71.0	3.0	60.0

Source: Compiled by LSA (May 2018).
°F = degrees Fahrenheit
mph = miles per hour

6.2.2. Long-Term Monitoring

Long-term traffic noise level measurements were conducted to document the peak traffic noise hour. Long-term ambient noise monitoring was conducted using one dosimeter at two representative locations in the project area. The long-term noise level measurement at LT-1 was performed from 9:00 a.m. on Tuesday, April 17, 2018, to 9:00 a.m. on Wednesday, April 18, 2018, at a single-family residence at 1008 North King Street. Table 6.3 shows that traffic noise peaks during the 6:00 a.m., 7:00 a.m., and 8:00 a.m. hours at LT-1. The long-term noise level measurement at LT-2 was performed from 2:00 p.m. on Wednesday, April 18, 2018, to 2:00 p.m. on Thursday, April 19, 2018, at a single-family residence at 2505 West 16th Street. Table 6.4 shows that traffic noise peaks during the 8:00 a.m. hour at LT-2. The long-term noise monitoring locations are shown on Figure 5-1. The long-term noise level measurement results are shown in Tables 6.3 and 6.4.

6.3. Noise Model Calibration

Eight separate model runs for the 15 monitoring locations were conducted using the traffic counts and observed vehicle speeds collected during the ambient noise monitoring. The results of these model runs were compared to the measured ambient noise levels to ensure the accuracy of TNM 2.5. Correction factors known as K-factors were applied to each of the modeled receptor locations so that the monitored and modeled noise levels were the same. Table 6.5 shows the measured ambient noise level, the modeled noise levels using traffic counts and measured vehicle speeds during noise monitoring, and the K-factor at each of the 15 monitored locations.

As shown in Table 6.5, some of the monitoring locations have K-factors greater than 3 dBA but less than 5 dBA. Based on Section 4.4.1.6 of the TeNS, K-factors between 3 and 4 can be calibrated unless the validity of the noise measurement conducted is in serious doubt.

Table 6.3. Long-Term (24-Hour) Noise Level Measurement Results at 1008 North King Street, Santa Ana, California (LT-1)

	Start Time	Date	Noise Level (dBA L_{eq})
1	9:00 AM	4/17/2018	72
2	10:00 AM	4/17/2018	71
3	11:00 AM	4/17/2018	71
4	12:00 PM	4/17/2018	72
5	1:00 PM	4/17/2018	72
6	2:00 PM	4/17/2018	72
7	3:00 PM	4/17/2018	71
8	4:00 PM	4/17/2018	68
9	5:00 PM	4/17/2018	66
10	6:00 PM	4/17/2018	67
11	7:00 PM	4/17/2018	72
12	8:00 PM	4/17/2018	71
13	9:00 PM	4/17/2018	70
14	10:00 PM	4/17/2018	69
15	11:00 PM	4/17/2018	68
16	12:00 AM	4/18/2018	65
17	1:00 AM	4/18/2018	63
18	2:00 AM	4/18/2018	62
19	3:00 AM	4/18/2018	64
20	4:00 AM	4/18/2018	69
21	5:00 AM	4/18/2018	72
22	6:00 AM	4/18/2018	**73**[1]
23	7:00 AM	4/18/2018	**73**
24	8:00 AM	4/18/2018	**73**

Source: Compiled by LSA (May 2018).
[1] **Bold** numbers represent the peak traffic noise hour.
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels

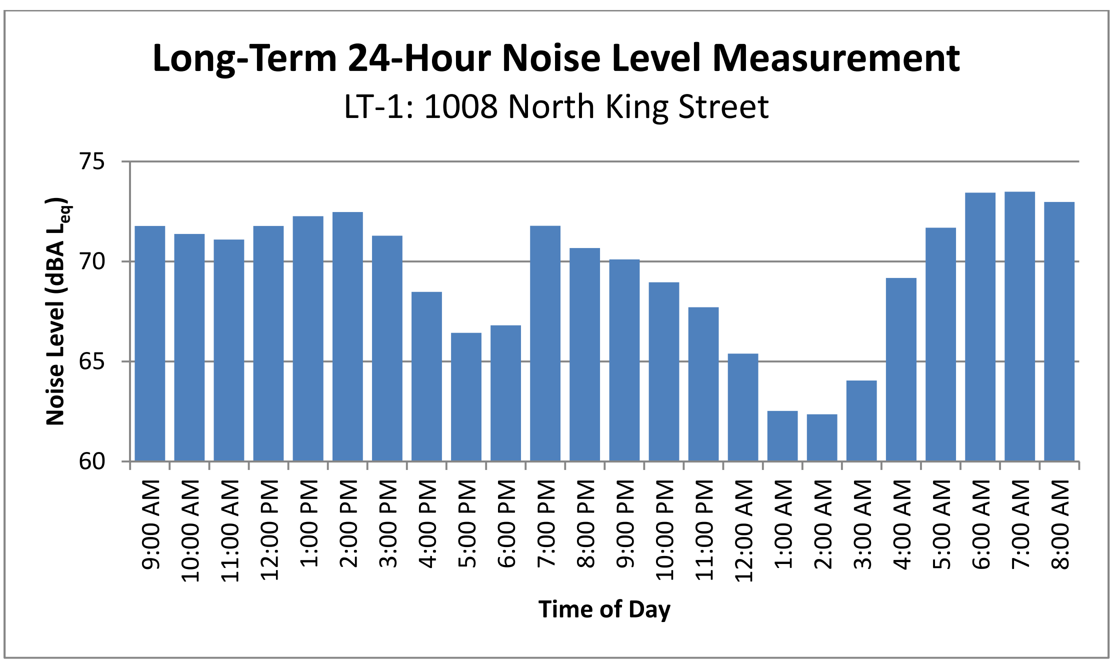

Table 6.4. Long-Term (24-Hour) Noise Level Measurement Results at 2505 West 16th Street, Santa Ana, California (LT-2)

	Start Time	Date	Noise Level (dBA L_{eq})
1	2:00 PM	4/18/2018	64
2	3:00 PM	4/18/2018	64
3	4:00 PM	4/18/2018	64
4	5:00 PM	4/18/2018	64
5	6:00 PM	4/18/2018	64
6	7:00 PM	4/18/2018	64
7	8:00 PM	4/18/2018	63
8	9:00 PM	4/18/2018	63
9	10:00 PM	4/18/2018	62
10	11:00 PM	4/18/2018	59
11	12:00 AM	4/19/2018	57
12	1:00 AM	4/19/2018	54
13	2:00 AM	4/19/2018	55
14	3:00 AM	4/19/2018	56
15	4:00 AM	4/19/2018	60
16	5:00 AM	4/19/2018	63
17	6:00 AM	4/19/2018	66
18	7:00 AM	4/19/2018	66
19	8:00 AM	4/19/2018	**67**[1]
20	9:00 AM	4/19/2018	66
21	10:00 AM	4/19/2018	65
22	11:00 AM	4/19/2018	65
23	12:00 PM	4/19/2018	66
24	1:00 PM	4/19/2018	64

Source: Compiled by LSA (May 2018).

[1] **Bold** numbers represent the peak traffic noise hour.

dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels

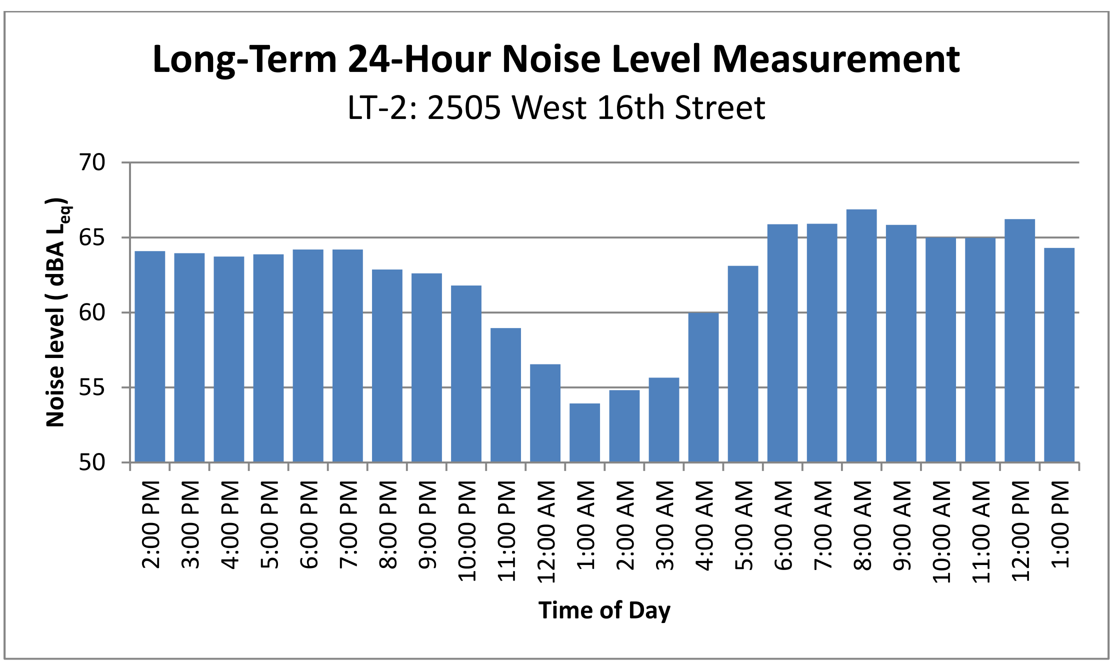

Table 6.5. Model Calibration

Monitor No.	Measured Noise Level (dBA L_{eq})	Modeled Noise Level (dBA L_{eq})	K-Factor (dBA)
ST-1	63.4	65.6	-2.2
ST-2	63.8	65.5	-1.7
ST-3	64.9	67.9	-3.0
ST-4	67.3	70.5	-3.2
ST-5	65.6	62.8	2.8
ST-6	64.7	62.6	2.1
ST-7	66.7	68.6	-1.9
ST-8	56.7	59.1	-2.4
ST-9	55.7	57.2	-1.5
ST-10	53.3	54.7	-1.4
ST-11	50.0	53.8	-3.8
ST-12	54.5	57.1	-2.6
ST-13	55.7	57.6	-1.9
ST-14	63.0	62.0	1.0
ST-15	74.0	73.0	1.0

Source: Compiled by LSA (May 2018).
dBA = A-weighted decibel(s)
dBA L_{eq} = equivalent continuous sound level measured in A-weighted decibels
ST = Short-Term

All of the monitoring locations were rechecked and noise level measurements and field surveys of existing features and the TNM 2.5 modeled input data were re-examined and determined to be accurate. Therefore, the K-factors shown in Table 6.5 were used to calibrate the noise model.

6.4. Existing Noise Levels

The existing a.m. peak-hour traffic volumes obtained from the *Traffic Impact Analysis* (LSA 2018) or the worst-case traffic operations (prior to speed degradation), whichever were lower, were coded into TNM 2.5 with existing roadway conditions. The a.m. peak-hour traffic volumes were selected over the p.m. peak-hour traffic volumes because the long-term (24-hour) noise level measurements indicate that the peak noise hour occurs during this period. Table B.1 in Appendix B provides the results of the existing traffic noise modeling. Figure 5-1 shows the locations of the modeled receptors.

Chapter 7. Future Noise Environment, Impacts, and Considered Abatement

7.1. Future Noise Environment and Impacts

This NSR was prepared to determine the future traffic noise impacts at receptors along Fairview Street. Potential long-term noise impacts under the Future Build condition are solely from traffic noise. Traffic noise was evaluated for the worst-case traffic condition. Using coordinates obtained from the topographic maps, 92 receptor locations were evaluated in the model.

Future traffic noise levels at all 92 receptor locations were determined using either the worst-case traffic operations (prior to speed degradation) or the 2040 a.m. peak-hour traffic volumes obtained from the *Traffic Impact Analysis* (LSA 2018), whichever were lower, as described in Section 5.3. Table B.1 in Appendix B summarizes the TNM results for the Existing, Future No Build, and Future Build conditions. The modeled future noise levels with the proposed Project were compared to the modeled existing noise levels (after calibration) from TNM 2.5 to determine whether a substantial noise increase would occur. The modeled future noise levels were also compared to the NAC to determine whether a traffic noise impact would occur.

Traffic noise impacts occur when either of the following occurs: (1) the traffic noise level at a receptor location is predicted to “approach or exceed” its corresponding NAC or (2) the predicted traffic noise level is 12 dBA or more over the corresponding modeled existing noise level at the receptor locations analyzed. When traffic noise impacts occur, noise abatement measures must be considered. Of the 92 modeled receptors, 9 receptors under the Future Build condition would approach or exceed the NAC. No receptor would experience a substantial noise increase of 12 dBA or more over its corresponding modeled existing noise level under any scenario. The receptor locations listed below would be or would continue to be exposed to noise levels that either approach or exceed the NAC under Future Build conditions.

- **Receptor R-5:** This receptor location represents an existing single-family residence on the northbound side of Fairview Street between Civic Center Drive and West 9th Street. Currently, a 4.7 ft high existing wall shields the residence.

One noise barrier (Noise Barrier [NB] No. 1) was modeled along the private property line on the northbound side of Fairview Street to shield this residence.

- **Receptor R-8:** This receptor location represents an existing single-family residence on the southbound side of Fairview Street between Civic Center Drive and West 9th Street. Currently, a 2.7 ft to 6 ft high existing wall shields this residence. One noise barrier (NB No. 2) was modeled along the private property line on the southbound side of Fairview Street to shield this residence.
- **Receptor R-14:** This receptor location represents an existing single-family residence on the southbound side of Fairview Street between West 9th Street and West 12th Street. Currently, a 5.3 ft high existing wall shields this residence. One noise barrier (NB No. 3) was modeled along the private property line on the southbound side of Fairview Street to shield this residence.
- **Receptor R-23:** This receptor location represents existing multifamily residences on the southbound side of Fairview Street between West 9th Street and West 12th Street. Existing wood fences along the private property line would not provide effective noise attenuation at these residences. One noise barrier (NB No. 4) was modeled along the private property line on the southbound side of Fairview Street to shield these residences.
- **Receptors R-24, R-25, and R-40:** These receptor locations represent existing single-family residences on the northbound side of Fairview Street between West 9th Street and West 12th Street. Currently, a 4 ft to 6 ft high wall shields these residences. One noise barrier (NB No. 5) was modeled along the private property line on the northbound side of Fairview Street to shield these residences.
- **Receptor R-46:** This receptor location represents an existing single-family residence on the southbound side of Fairview Street between West 12th Street and the Santa Ana River. Currently, a 5.7 ft high existing wall shields this residence. One noise barrier (NB No. 6) was modeled along the private property line on the southbound side of Fairview Street to shield this residence.
- **Receptor R-51:** This receptor location represents a park on the southbound side of Fairview Street between West 12th Street and the Santa Ana River. Currently, no wall shields the park. Because there is driveway and pedestrian access onto Fairview Street, it is not feasible to abate traffic noise from Fairview Street with noise barriers.

7.2. Preliminary Noise Abatement Analysis

Noise abatement is considered where noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level. According to 23 CFR

772(13)(c) and 772(15)(c), federal funding may be used for the following abatement measures:

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way.
- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- Alteration of horizontal and vertical alignments.
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise.

Noise barriers are the only form of noise abatement considered for this project. Each noise barrier has been evaluated for feasibility based on achievable noise reduction. For each noise barrier found to be acoustically feasible, reasonable cost allowances were calculated by multiplying the number of benefited receptors by $95,000. Table B.1 in Appendix B summarizes the results at receptor locations for the noise barriers evaluated in detail for this project. Table B.1 shows predicted noise levels, insertion loss, and the number of benefited receptors at analyzed barrier heights for the Future Build condition.

For any noise barrier to be considered reasonable from a cost perspective, the estimated cost of the noise barrier should be equal to or less than the total cost allowance calculated for the barrier. The cost calculations of the noise barrier must include all items appropriate and necessary for its construction (e.g., traffic control, drainage modification, retaining walls, landscaping for graffiti abatement, and right-of-way costs). Construction cost estimates are not provided in this NSR but will be presented in the Noise Abatement Decision Report (NADR). The NADR is a design responsibility and is prepared to compile information from the NSR, other relevant environmental studies, and design considerations into a single comprehensive document before public review of the project. The NADR is prepared by the project engineer after completion of the NSR and prior to publication of the draft environmental document. The NADR includes noise abatement construction cost estimates that have been prepared and signed by the project engineer based on site-specific conditions. Construction cost estimates are compared to reasonableness allowances in the NADR to identify which wall configurations are reasonable from a cost perspective.

The design of noise barriers presented in this report is preliminary and has been conducted at a level appropriate for environmental review and not for final design of the project. Preliminary information on the physical location, length, and height of noise barriers is provided in this report. If pertinent parameters change substantially during the final project design, preliminary noise barrier designs may be modified or eliminated from the final project. A final decision on the construction of the noise abatement will be made upon completion of the project design.

7.2.1. Future Build

The following is a discussion of the noise abatement measures considered for the Future Build condition where traffic noise impacts are predicted.

7.2.1.1. Noise Barrier No. 1

A 169 ft long barrier (STA 36+55 to STA 37+31) along the private property line on the northbound side of Fairview Street between Civic Center Drive and 9th Street was analyzed to shield Receptor R-5. Table B.1 in Appendix B shows the results of the analysis. NB No. 1 was evaluated from 6 ft to 16 ft high in 2 ft increments. Figure 7-1 shows the location of NB No. 1. Table 7.1 lists the highest noise barrier reduction, the number of benefited residences, the reasonable allowance per benefited residence, and the total reasonable allowance for each barrier height. The minimum feasible barrier height is 8 ft.

Table 7.1. Summary of Reasonableness Allowances for Noise Barrier No. 1

Build Alternative with Barrier[1]	6 ft Barrier	8 ft Barrier	10 ft Barrier	12 ft Barrier	14 ft Barrier	16 ft Barrier
Highest Noise Barrier Reduction (dB)	3	5	7	8	9	10
Number of Benefited Receptors/Units	0	1	1	1	1	1
Reasonable Allowance per Benefited Receptor/Unit[2]	$0	$95,000	$95,000	$95,000	$95,000	$95,000
Total Reasonable Allowance	$0	$95,000	$95,000	$95,000	$95,000	$95,000

Source: Compiled by LSA (2018).

[1] A NADR will be prepared to identify the noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[2] The cost consideration in the reasonableness determination of noise abatement is based on a 2018 allowance per benefited receptor/unit of $95,000.

dB = decibels

ft = foot/feet

NADR = Noise Abatement Decision Report

LEGEND

- Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls
- Modeled Noise Barriers

0 75 150
FEET

SOURCE: Google Aerial (12/2017); WKE (2017)

I:\WKE1702\GIS\NSR_ModeledNoiseBarriers.mxd (1/14/2019)

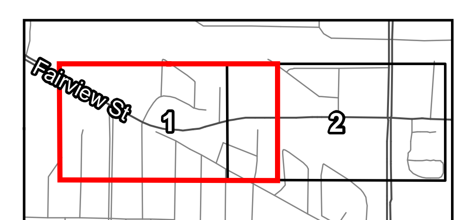

FIGURE 7-1
Sheet 1 of 2

Fairview Street Improvements
from 9th Street to 16th Street and Bridge Replacement Project

Modeled Noise Barrier and Receptor Locations

Federal Project No.: BRLS 5063(184)

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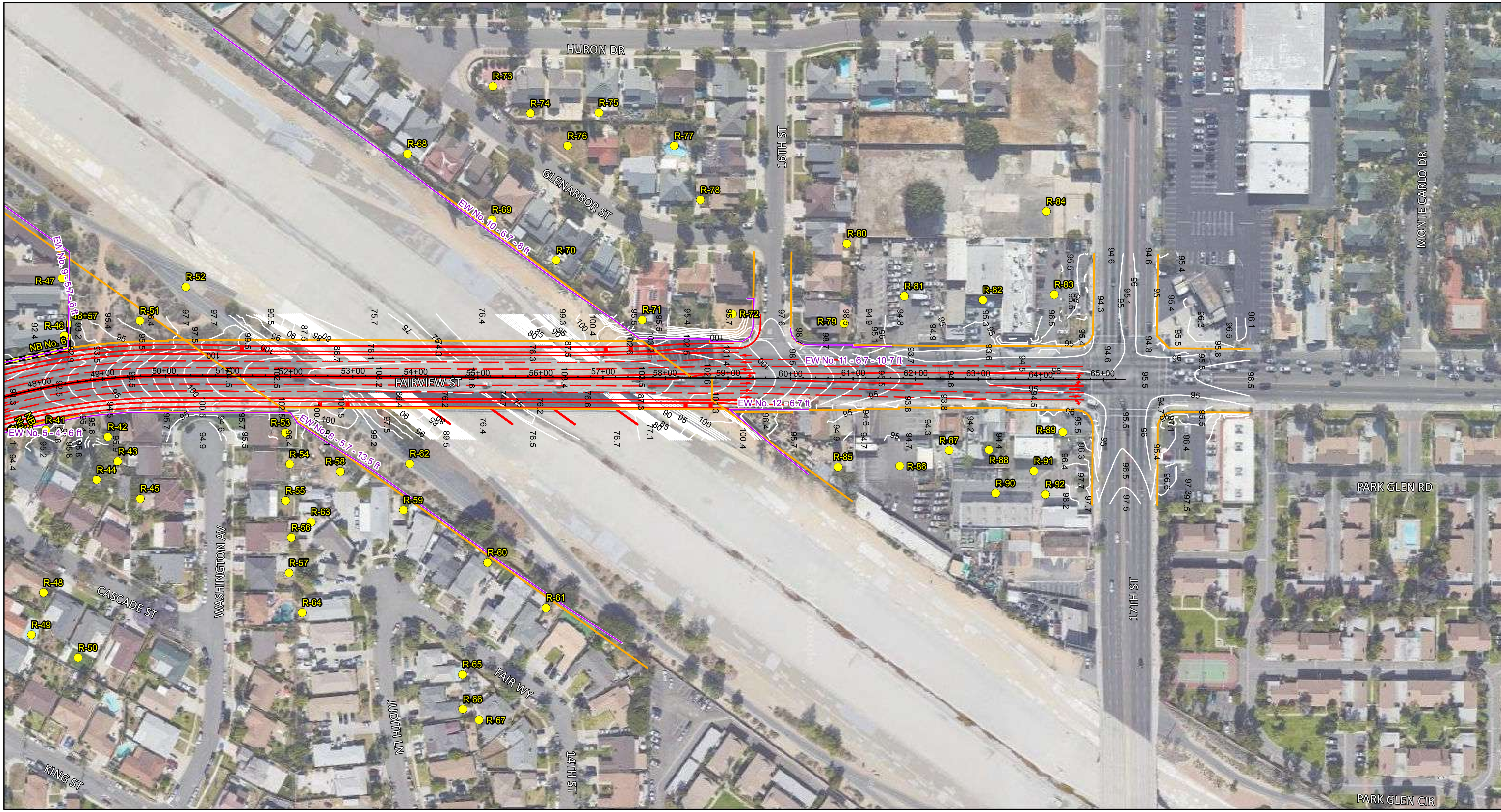

LEGEND

- Modeled Receptors
- Proposed Right of Way Acquisition
- Proposed Improvements
- Existing Right of Way
- Existing Walls
- Modeled Noise Barriers

0 75 150
FEET

SOURCE: Google Aerial (12/2017); WKE (2017)

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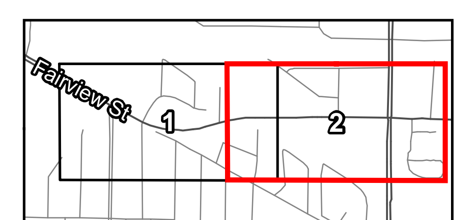

FIGURE 7-1
Sheet 2 of 2

Fairview Street Improvements
from 9th Street to 16th Street and Bridge Replacement Project
Modeled Noise Barrier and Receptor Locations
Federal Project No.: BRLS 5063(184)

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7.2.1.2. Noise Barrier No. 2

A 129 ft long barrier (STA 36+30 to STA 37+07) along the private property line on the southbound side of Fairview Street between Civic Center Drive and 9th Street was analyzed to shield Receptor R-8. Table B.1 in Appendix B shows the results of the analysis. NB No. 2 was evaluated from 6 ft to 16 ft high in 2 ft increments. Figure 7-1 shows the location of NB No. 2. Table 7.2 lists the highest noise barrier reduction, the number of benefited residences, the reasonable allowance per benefited residence, and the total reasonable allowance for each barrier height. The minimum feasible barrier height is 8 ft.

Table 7.2. Summary of Reasonableness Allowances for Noise Barrier No. 2

Build Alternative with Barrier[1]	6 ft Barrier	8 ft Barrier	10 ft Barrier	12 ft Barrier	14 ft Barrier	16 ft Barrier
Highest Noise Barrier Reduction (dB)	4	6	8	9	10	11
Number of Benefited Receptors/Units	0	1	1	1	1	1
Reasonable Allowance Per Benefited Receptor/Unit[2]	$0	$95,000	$95,000	$95,000	$95,000	$95,000
Total Reasonable Allowance	$0	$95,000	$95,000	$95,000	$95,000	$95,000

Source: Compiled by LSA (2018).

[1] A NADR will be prepared to identify the noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[2] The cost consideration in the reasonableness determination of noise abatement is based on a 2018 allowance per benefited receptor/unit of $95,000.

dB = decibels

ft = foot/feet

NADR = Noise Abatement Decision Report

7.2.1.3. Noise Barrier No. 3

A 113 ft long barrier (STA 38+70 to STA 39+22) along the private property line on the southbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptor R-14. Table B.1 in Appendix B shows the results of the analysis. NB No. 3 was evaluated from 6 ft to 16 ft high in 2 ft increments. Figure 7-1 shows the location of NB No. 3. Table 7.3 lists the highest noise barrier reduction, the number of benefited residences, the reasonable allowance per benefited residence, and the total reasonable allowance for each barrier height. The minimum feasible barrier height is 8 ft.

Table 7.3. Summary of Reasonableness Allowances for Noise Barrier No. 3

Build Alternative with Barrier[1]	6 ft Barrier	8 ft Barrier	10 ft Barrier	12 ft Barrier	14 ft Barrier	16 ft Barrier
Highest Noise Barrier Reduction (dB)	4	6	7	7	8	8
Number of Benefited Receptors/Units	0	1	1	1	1	1
Reasonable Allowance per Benefited Receptor/Unit[2]	$0	$95,000	$95,000	$95,000	$95,000	$95,000
Total Reasonable Allowance	$0	$95,000	$95,000	$95,000	$95,000	$95,000

Source: Compiled by LSA (2018).
[1] A NADR will be prepared to identify the noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.
[2] The cost consideration in the reasonableness determination of noise abatement is based on a 2018 allowance per benefited receptor/unit of $95,000.
dB = decibels
ft = foot/feet
NADR = Noise Abatement Decision Report

7.2.1.4. Noise Barrier No. 4

A 171 ft long barrier (STA 43+45 to STA 45+15) along the private property line on the southbound side of Fairview Street between West 9th Street and West 12th Street was analyzed to shield Receptor R-23. Table B.1 in Appendix B shows the results of the analysis. NB No. 4 was evaluated from 6 ft to 16 ft high in 2 ft increments. Figure 7-1 shows the location of NB No. 4. Table 7.4 lists the highest noise barrier reduction, the number of benefited residences, the reasonable allowance per benefited residence, and the total reasonable allowance for each barrier height. The minimum feasible barrier height is 6 ft.

Table 7.4. Summary of Reasonableness Allowances for Noise Barrier No. 4

Build Alternative with Barrier[1]	6 ft Barrier	8 ft Barrier	10 ft Barrier	12 ft Barrier	14 ft Barrier	16 ft Barrier
Highest Noise Barrier Reduction (dB)	7	10	12	14	15	16
Number of Benefited Receptors/Units	2	2	2	2	2	2
Reasonable Allowance Per Benefited Receptor/Unit[2]	$95,000	$95,000	$95,000	$95,000	$95,000	$95,000
Total Reasonable Allowance	$190,000	$190,000	$190,000	$190,000	$190,000	$190,000

Source: Compiled by LSA (2018).
[1] A NADR will be prepared to identify the noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.
[2] The cost consideration in the reasonableness determination of noise abatement is based on a 2018 allowance per benefited receptor/unit of $95,000.
dB = decibels
ft = foot/feet
NADR = Noise Abatement Decision Report

7.2.1.5. Noise Barrier No. 5

A 705 ft long barrier (STA 40+45 to STA 42+14) along the private property line on the northbound side of Fairview Street between Civic Center Drive and the Santa Ana River was analyzed to shield Receptors R-24, R-25, and R-40. Table B.1 in Appendix B shows the results of the analysis. NB No. 5 was evaluated from 6 ft to 16 ft high in 2 ft increments. Figure 7-1 shows the location of NB No. 5. Table 7.5 lists the highest noise barrier reduction, the number of benefited residences, the reasonable allowance per benefited residence, and the total reasonable allowance for each barrier height. The minimum feasible barrier height is 6 ft.

Table 7.5. Summary of Reasonableness Allowances for Noise Barrier No. 5

Build Alternative with Barrier[1]	6 ft Barrier	8 ft Barrier	10 ft Barrier	12 ft Barrier	14 ft Barrier	16 ft Barrier
Highest Noise Barrier Reduction (dB)	6	9	11	13	14	16
Number of Benefited Receptors/Units	2	3	3	5	7	7
Reasonable Allowance Per Benefited Receptor/Unit[2]	$95,000	$95,000	$95,000	$95,000	$95,000	$95,000
Total Reasonable Allowance	$190,000	$285,000	$285,000	$475,000	$665,000	$665,000

Source: Compiled by LSA (2018).

1 A NADR will be prepared to identify the noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

2 The cost consideration in the reasonableness determination of noise abatement is based on a 2018 allowance per benefited receptor/unit of $95,000.

dB = decibels

ft = foot/feet

NADR = Noise Abatement Decision Report

7.2.1.6. Noise Barrier No. 6

A 184 ft long barrier (STA 47+16 to STA 48+57) along the private property line on the southbound side of Fairview Street between West 12th Street and the Santa Ana River was analyzed to shield Receptor R-46. Table B.1 in Appendix B shows the results of the analysis. NB No. 6 was evaluated from 6 ft to 16 ft high in 2 ft increments. Figure 7-1 shows the location of NB No. 6. Table 7.6 lists the highest noise barrier reduction, the number of benefited residences, the reasonable allowance per benefited residence, and the total reasonable allowance for each barrier height. The minimum feasible barrier height is 10 ft.

Table 7.6. Summary of Reasonableness Allowances for Noise Barrier No. 6

Build Alternative with Barrier[1]	6 ft Barrier	8 ft Barrier	10 ft Barrier	12 ft Barrier	14 ft Barrier	16 ft Barrier
Highest Noise Barrier Reduction (dB)	0	4	7	8	9	10
Number of Benefited Receptors/Units	0	0	1	1	1	1
Reasonable Allowance Per Benefited Receptor/Unit[2]	$0	$0	$95,000	$95,000	$95,000	$95,000
Total Reasonable Allowance	$0	$0	$95,000	$95,000	$95,000	$95,000

Source: Compiled by LSA (2018).

[1] A NADR will be prepared to identify the noise barrier construction cost information and the noise barriers that are reasonable from a cost perspective.

[2] The cost consideration in the reasonableness determination of noise abatement is based on a 2018 allowance per benefited receptor/unit of $95,000.

dB = decibels

ft = foot/feet

NADR = Noise Abatement Decision Report

Chapter 8. Construction Noise

Two types of short-term noise impacts would occur during construction of the proposed Project. The first type would be from construction crew commutes and the transport of construction equipment and materials to the project site that 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 volumes in the project vicinity. A high single-event noise exposure potential at a maximum level of 84 dBA L_{max} from trucks passing at 50 ft will exist. However, the projected construction traffic volume will be minimal when compared to existing traffic volumes on Fairview Street and other adjacent roadways, and the 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 discrete 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 in the project area 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 8.1 lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments based on a distance of 50 ft between the equipment and a noise receptor.

Typical noise levels at 50 ft from an active construction area range up to 88 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 excavating machinery (e.g., backfillers, bulldozers, and front loaders). Earthmoving and compacting equipment includes compactors, scrapers, and graders. 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.

Table 8.1. RCNM Default Noise Emission Reference Levels and Usage Factors

Equipment Description	Spec 721.560[1] dBA L_{max} at 50 ft	Actual Measured[2] dBA L_{max} at 50 ft
Backhoe	80	78
Compactor (ground)	80	83
Crane	85	81
Dozer	85	82
Dump Truck	84	76
Excavator	85	81
Flat Bed Truck	84	74
Front-End Loader	80	79
Grader	85	N/A[3]
Jackhammer	85	89
Pickup Truck	55	75
Pneumatic Tools	85	85
Pumps	77	81
Rock Drill	85	81
Roller	85	80
Scraper	85	84
Tractor	84	N/A
Vibratory Pile Driver	95	101

Source: Federal Highway Administration, *Roadway Construction Noise Model,* Table 9.1 (January 2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.

[1] Maximum noise levels were developed based on Spec 721.560 from the CA/T program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

[2] The maximum noise level was developed based on the average noise level measured for each piece of equipment during the CA/T program in Boston, Massachusetts.

[3] Because the maximum noise level based on the average noise level measured for this piece of equipment was not available, the maximum noise level developed based on Spec 721.560 was used.

CA/T = Central Artery/Tunnel
dBA = decibel(s)
ft = foot/feet
L_{max} = maximum instantaneous sound level
N/A = not applicable
RCNM = Roadway Construction Noise Model

Construction of the proposed Project is expected to require the use of graders, bulldozers, and water trucks/pickup trucks. Noise associated with the use of construction equipment is estimated to be between 55 and 85 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. As seen in Table 8.1, the maximum noise level generated by each grader is assumed to be approximately 85 dBA L_{max} at 50 ft from the grader in operation. Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks/pickup trucks is estimated to be approximately 55 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 88 dBA L_{max} at a distance of 50 ft from an active construction area. Based on a usage factor of 40 percent, the worst-case combined noise level during this phase of construction would be 84 dBA L_{eq} at a distance of 50 ft from the active construction area.

The closest residences are located approximately 50 ft from the project construction areas. Therefore, the closest residences may be subject to short-term noise reaching 88 dBA L_{max} generated by construction activities in the project area. Compliance with Section 14-8.02 of the Caltrans Standard Specifications and Section 18-314 of the City's Municipal Code will be required to minimize construction noise impacts on land uses adjacent to the project site. In compliance with these regulations, the contractor shall not perform any construction activities between the hours of 8:00 p.m. and 7:00 a.m. on weekdays and Saturdays, or at any time on Sundays and federal holidays.

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Chapter 9. References

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Appendix A. Traffic Counts and Traffic Data

This appendix contains tables presenting the traffic counts with observed vehicle speeds during ambient noise level measurements and traffic data for Existing, Future No Build, and Future Build conditions.

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Table A-1. Existing Traffic Counts and Posted Speed Limit During Short-Term Noise Measurement

	Existing Traffic Counts (20 min)			Distribution (%)			Traffic Volume (Hourly)			Lane 1-2			Lane 3			Posted Speed Limit (mph)		
	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy
SET 1 (ST-1, ST-2, ST-3)																		
Fairview Street NB	280	10	6	0.95	0.03	0.02	840	30	18	560	20	12	280	10	6	45	45	45
Fairview Street SB	340	19	5	0.93	0.05	0.01	1020	57	15	680	38	10	340	19	5	45	45	45
SET 2 (ST-4, ST-5, ST-8)																		
Fairview Street NB	305	11	4	0.95	0.03	0.01	915	33	12	610	22	8	305	11	4	45	45	45
Fairview Street SB	313	12	6	0.95	0.04	0.02	939	36	18	626	24	12	313	12	6	45	45	45
SET 3 (ST-6)																		
Fairview Street NB	313	5	6	0.97	0.02	0.02	939	15	18	626	10	12	313	5	6	45	45	45
Fairview Street SB	307	8	3	0.97	0.03	0.01	921	24	9							45	45	45
SET 4 (ST-7)																		
Fairview Street NB	473	14	4	0.96	0.03	0.01	1419	42	12							45	45	45
Fairview Street SB	361	14	3	0.96	0.04	0.01	1083	42	9							45	45	45
SET 5 (ST-9, ST-10)																		
Fairview Street NB	359	17	3	0.95	0.04	0.01	1077	51	9							45	45	45
Fairview Street SB	326	9	3	0.96	0.03	0.01	978	27	9							45	45	45
SET 6 (ST-11, ST-12)																		
Fairview Street NB	377	33	6	0.91	0.08	0.01	1131	99	18							45	45	45
Fairview Street SB	378	15	2	0.96	0.04	0.01	1134	45	6							45	45	45
17th St EB	272	8	4	0.96	0.03	0.01	816	24	12	544	16	8	272	8	4	45	45	45
17th St WB	260	3	3	0.98	0.01	0.01	780	9	9	520	6	6	260	3	3	45	45	45
SET 7 (ST-13, ST-15)																		
Fairview Street NB	300	8	2	0.97	0.03	0.01	900	24	6							45	45	45
Fairview Street SB	280	7	10	0.94	0.02	0.03	840	21	30							45	45	45
17th St EB	280	2	3	0.98	0.01	0.01	840	6	9	560	4	6	280	2	3	45	45	45
17th St WB	310	4	4	0.97	0.01	0.01	930	12	12	620	8	8	310	4	4	45	45	45
SET 8 (ST-14)																		
Fairview Street NB	270	11	3	0.95	0.04	0.01	810	33	9							45	45	45
Fairview Street SB	320	6	7	0.96	0.02	0.02	960	18	21							45	45	45

Table A-2. Existing Traffic Volumes (2017)

		AM Peak	PM Peak	Worst-Case	Selected	Vehicle Distribution (%)			Modeled Volumes			Lanes 1 & 2			Lane 3			Posted Speed Limit (mph)		
Roadway Segments	No. of Lanes	Hour	Hour	Traffic Volume	Volume	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy
N Fairview St NB - North of 17th St	2	1,313	1,686	1,500	1,313	0.95	0.04	0.01	1,247	53	13							45	45	45
N Fairview St NB - Between 17th St and W 16th St	2	1,343	1,517	1,500	1,343	0.95	0.04	0.01	1,276	54	13							45	45	45
N Fairview St NB - Between W 16th St and W 12th St	2	1,355	1,521	1,500	1,355	0.95	0.04	0.01	1,287	54	14							45	45	45
N Fairview St NB - Between W 12th St and W 9th St	2	1,365	1,488	1,500	1,365	0.95	0.04	0.01	1,296	55	14	864	37	9	432	18	5	45	45	45
N Fairview St NB - Between W 9th St and W Civic Center Dr	3	1,406	1,559	2,250	1,406	0.95	0.04	0.01	1,336	56	14	891	37	9	445	19	5	45	45	45
N Fairview St NB - South of W Civic Center Dr	3	1,668	1,809	2,250	1,668	0.95	0.04	0.01	1,584	67	17	1,056	45	11	528	22	6	45	45	45
N Fairview St SB - North of 17th St	2	1,753	1,461	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between 17th St and W 16th St	2	1,616	1,548	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 16th St and W 12th St	2	1,718	1,558	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 12th St and W 9th St	2	1,708	1,456	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 9th St and W Civic Center Dr	3	1,703	1,446	2,250	1,703	0.95	0.04	0.01	1,618	68	17	1,079	45	11	539	23	6	45	45	45
N Fairview St SB - South of W Civic Center Dr	3	1,721	1,747	2,250	1,721	0.95	0.04	0.01	1,635	69	17	1,090	46	11	545	23	6	45	45	45
17th St EB - West of N Fairview St	3	1,557	1,290	2,250	1,557	0.95	0.04	0.01	1,479	62	16	986	41	11	493	21	5	40	40	40
17th St EB - East of N Fairview St	3	1,872	1,283	2,250	1,872	0.95	0.04	0.01	1,778	75	19	1,185	50	13	593	25	6	40	40	40
17th St WB - West of N Fairview St	3	736	1,462	2,250	736	0.95	0.04	0.01	700	29	7	467	19	5	233	10	2	40	40	40
17th St WB - East of N Fairview St	3	882	1,627	2,250	882	0.95	0.04	0.01	838	35	9	559	23	6	279	12	3	40	40	40
W 16th St - West of N Fairview St	2	114	46	1,500	114	0.95	0.04	0.01	108	5	1							25	25	25
W 12th St - West of N Fairview St	2	26	31	1,500	26	0.95	0.04	0.01	25	1	0							25	25	25
W 9th St - West of N Fairview St	2	103	114	1,500	103	0.95	0.04	0.01	98	4	1							25	25	25
W 9th St - East of N Fairview St	2	122	106	1,500	122	0.95	0.04	0.01	116	5	1							25	25	25
W Civic Center Dr EB - East of N Fairview St	2	682	590	1,500	682	0.95	0.04	0.01	648	27	7							35	35	35
W Civic Center Dr WB - East of N Fairview St	2	434	639	1,500	434	0.95	0.04	0.01	413	17	4							35	35	35

Table A-3. Future No Build Traffic Volumes (2040)

Roadway Segments	No. of Lanes	AM Peak Hour	PM Peak Hour	Worst-Case Traffic Volume	Selected Volume	Vehicle Distribution (%)			Modeled Volumes			Lanes 1 & 2			Lane 3			Posted Speed Limit (mph)		
						Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy
N Fairview St NB - North of 17th St	2	1,881	2,436	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St NB - Between 17th St and W 16th St	2	1,572	1,802	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St NB - Between W 16th St and W 12th St	2	1,584	1,806	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St NB - Between W 12th St and W 9th St	2	1,594	1,773	1,500	1,500	0.95	0.04	0.01	1,425	60	15	950	40	10	475	20	5	45	45	45
N Fairview St NB - Between W 9th St and W Civic Center Dr	3	1,646	1,844	2,250	1,646	0.95	0.04	0.01	1,564	66	16	1,043	44	11	521	22	5	45	45	45
N Fairview St NB - South of W Civic Center Dr	3	1,840	1,952	2,250	1,840	0.95	0.04	0.01	1,748	74	18	1,165	49	12	583	25	6	45	45	45
N Fairview St SB - North of 17th St	2	2,467	2,068	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between 17th St and W 16th St	2	1,867	1,808	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 16th St and W 12th St	2	1,969	1,818	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 12th St and W 9th St	2	1,959	1,716	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 9th St and W Civic Center Dr	3	1,942	1,705	2,250	1,942	0.95	0.04	0.01	1,845	78	19	1,230	52	13	615	26	6	45	45	45
N Fairview St SB - South of W Civic Center Dr	3	1,777	2,082	2,250	1,777	0.95	0.04	0.01	1,688	71	18	1,125	47	12	563	24	6	45	45	45
17th St EB - West of N Fairview St	3	1,500	1,339	2,250	1,500	0.95	0.04	0.01	1,425	60	15	950	40	10	475	20	5	40	40	40
17th St EB - East of N Fairview St	3	1,910	1,284	2,250	1,910	0.95	0.04	0.01	1,815	76	19	1,210	51	13	605	25	6	40	40	40
17th St WB - West of N Fairview St	3	736	1,462	2,250	736	0.95	0.04	0.01	700	29	7	467	19	5	233	10	2	40	40	40
17th St WB - East of N Fairview St	3	853	1,697	2,250	853	0.95	0.04	0.01	810	34	9	540	23	6	270	11	3	40	40	40
W 16th St - West of N Fairview St	2	114	46	1,500	114	0.95	0.04	0.01	108	5	1							25	25	25
W 12th St - West of N Fairview St	2	26	31	1,500	26	0.95	0.04	0.01	25	1	0							25	25	25
W 9th St - West of N Fairview St	2	103	114	1,500	103	0.95	0.04	0.01	98	4	1							25	25	25
W 9th St - East of N Fairview St	2	122	106	1,500	122	0.95	0.04	0.01	116	5	1							25	25	25
W Civic Center Dr EB - East of N Fairview St	2	758	590	1,500	758	0.95	0.04	0.01	720	30	8							35	35	35
W Civic Center Dr WB - East of N Fairview St	2	427	780	1,500	427	0.95	0.04	0.01	406	17	4							35	35	35

Table A-4. Future Build Traffic Volumes (Year 2040)

Roadway Segments	No. of Lanes	AM Peak Hour	PM Peak Hour	Worst-Case Traffic Volume	Selected Volume	Vehicle Distribution (%)			Modeled Volumes			Lanes 1 & 2			Lane 3			Posted Speed Limit (mph)		
						Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy	Auto	Medium	Heavy
N Fairview St NB - North of 17th St	2	1,931	2,453	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St NB - Between 17th St and W 16th St	2	1,784	2,086	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St NB - Between W 16th St and W 12th St	3	1,802	2,102	2,250	1,802	0.95	0.04	0.01	1,712	72	18	1,141	48	12	571	24	6	45	45	45
N Fairview St NB - Between W 12th St and W 9th St	3	1,810	2,059	2,250	1,810	0.95	0.04	0.01	1,720	72	18	1,147	48	12	573	24	6	45	45	45
N Fairview St NB - Between W 9th St and W Civic Center Dr	3	1,848	2,211	2,250	1,848	0.95	0.04	0.01	1,756	74	18	1,171	49	12	585	25	6	45	45	45
N Fairview St NB - South of W Civic Center Dr	3	1,928	2,170	2,250	1,928	0.95	0.04	0.01	1,832	77	19	1,221	51	13	611	26	6	45	45	45
N Fairview St SB - North of 17th St	2	2,546	2,077	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between 17th St and W 16th St	2	2,170	1,979	1,500	1,500	0.95	0.04	0.01	1,425	60	15							45	45	45
N Fairview St SB - Between W 16th St and W 12th St	3	2,272	1,989	2,250	2,250	0.95	0.04	0.01	2,137	90	23	1,425	60	15	712	30	8	45	45	45
N Fairview St SB - Between W 12th St and W 9th St	3	2,266	1,889	2,250	2,250	0.95	0.04	0.01	2,137	90	23	1,425	60	15	712	30	8	45	45	45
N Fairview St SB - Between W 9th St and W Civic Center Dr	3	2,249	1,878	2,250	2,249	0.95	0.04	0.01	2,137	90	22	1,425	60	15	712	30	7	45	45	45
N Fairview St SB - South of W Civic Center Dr	3	1,865	2,105	2,250	1,865	0.95	0.04	0.01	1,771	75	19	1,181	50	13	590	25	6	45	45	45
17th St EB - West of N Fairview St	3	1,516	1,294	2,250	1,516	0.95	0.04	0.01	1,440	61	15	960	41	10	480	20	5	40	40	40
17th St EB - East of N Fairview St	3	1,872	1,283	2,250	1,872	0.95	0.04	0.01	1,778	75	19	1,185	50	13	593	25	6	40	40	40
17th St WB - West of N Fairview St	3	735	1,462	2,250	735	0.95	0.04	0.01	699	29	7	466	19	5	233	10	2	40	40	40
17th St WB - East of N Fairview St	3	860	1,636	2,250	860	0.95	0.04	0.01	817	34	9	545	23	6	272	11	3	40	40	40
W 16th St - West of N Fairview St	2	120	58	1,500	120	0.95	0.04	0.01	114	5	1							25	25	25
W 12th St - West of N Fairview St	2	26	31	1,500	26	0.95	0.04	0.01	25	1	0							25	25	25
W 9th St - West of N Fairview St	2	103	114	1,500	103	0.95	0.04	0.01	98	4	1							25	25	25
W 9th St - East of N Fairview St	2	122	106	1,500	122	0.95	0.04	0.01	116	5	1							25	25	25
W Civic Center Dr EB - East of N Fairview St	2	840	592	1,500	840	0.95	0.04	0.01	798	34	8							35	35	35
W Civic Center Dr WB - East of N Fairview St	2	417	877	1,500	417	0.95	0.04	0.01	396	17	4							35	35	35

Appendix B. Predicted Future Noise Levels

This appendix contains a table that summarizes the traffic noise modeling results and noise barrier analysis results for Existing, Future No Build, and Future Build conditions.

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Table B.1 – Predicted Future Noise and Noise Barrier Analysis

Receptor No.	Existing Wall No.	NB No.	Noise Barrier Location	Land Use	No. of Receptors /Units	Existing Noise Level, dBA L_{eq}(h)	Future Noise Levels, dBA L_{eq}(h): 2040 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus Without Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction with Barrier, Barrier I.L., and NBR: 6 ft			8 ft			10 ft			12 ft			14 ft			16 ft		
													L_{eq}(h)	I.L.[1]	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR	L_{eq}(h)	I.L.	NBR
R-1				Office	1	62	62	63	1	1	E[2]	None	--[3]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-2	EW No. 1			Commercial	1	68	69	69	0	1	E[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-3	EW No. 1	1	ROW/PL	Residential	1	56	56	57	1	1	B(67)	None	57	0	0	57	0	0	56	1	0	56	1	0	56	1	0	56	1	0
R-4	EW No. 1	1	ROW/PL	Residential	1	56	57	57	0	1	B(67)	None	57	0	0	57	0	0	57	0	0	57	0	0	57	0	0	56	1	0
R-5	EW No. 1	1	ROW/PL	Residential	1	65	65	**66**[4]	1	1	B(67)	A/E	63	3	0	61	5[5]	1	59	7	1	58	8	1	57	9	1	56	10	1
R-6	EW No. 1	1	ROW/PL	Residential	1	57	58	58	0	1	B(67)	None	58	0	0	58	0	0	58	0	0	57	1	0	57	1	0	57	1	0
R-7	EW No. 1	1	ROW/PL	Residential	1	56	56	57	1	1	B(67)	None	56	1	0	56	1	0	56	1	0	56	1	0	56	1	0	56	1	0
R-8	EW No. 2	2	PL	Residential	1	**67**	**67**	**68**	1	1	B(67)	A/E	64	4	0	62	6	1	60	8	1	59	9	1	58	10	1	57	11	1
R-9	EW No. 2	2	PL	Residential	1	64	65	65	0	1	B(67)	None	65	0	0	64	1	0	64	1	0	64	1	0	64	1	0	64	1	0
R-10	EW No. 2			Residential	1	62	62	62	0	0	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-11	EW No. 3			Residential	1	61	61	62	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-12	EW No. 3			Residential	1	58	59	60	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-13	EW No. 3			Residential	1	56	57	58	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-14	EW No. 4	3	ROW	Residential	1	65	65	**67**	2	2	B(67)	A/E	63	4	0	61	6	1	60	7	1	60	7	1	59	8	1	59	8	1
R-15	EW No. 4	3	ROW	Residential	1	60	60	61	1	1	B(67)	None	60	1	0	60	1	0	59	2	0	59	2	0	59	2	0	59	2	0
R-16	EW No. 4	3	ROW	Residential	1	57	58	59	1	2	B(67)	None	58	1	0	58	1	0	58	1	0	57	2	0	57	2	0	57	2	0
R-17	EW No. 3			Residential	1	57	57	58	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-18	EW No. 3			Residential	1	54	55	56	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-19				Medical Office	1	66	66	67	1	1	E[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-20	EW No. 4			Residential	1	57	57	58	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-21	EW No. 4			Residential	2	53	53	54	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-22	EW No. 4			Residential	3	49	49	50	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-23	EW No. 4	4	ROW/PL	Residential	2	**66**	**67**	**68**	1	2	B(67)	A/E	61	7	2	58	10	2	56	12	2	54	14	2	53	15	2	52	16	2
R-24	EW No. 5	5	ROW	Residential	2	**66**	**66**	**67**	1	1	B(67)	A/E	61	6	2	58	9	2	56	11	2	54	13	2	53	14	2	51	16	2
R-25	EW No. 5	5	ROW	Residential	1	65	65	**66**	1	1	B(67)	A/E	62	4	0	59	7	1	57	9	1	55	11	1	54	12	1	53	13	1
R-26	EW No. 5	5	ROW	Vacant Land	1	63	63	65	2	2	F[2]	None	64	1	0	63	2	0	61	4	0	60	5	1	59	6	1	58	7	1
R-27	EW No. 6	5	ROW	Residential	1	52	52	53	1	1	B(67)	None	53	0	0	52	1	0	52	1	0	52	1	0	51	2	0	51	2	0
R-28	EW No. 6	5	ROW	Residential	1	51	51	52	1	1	B(67)	None	52	0	0	51	1	0	52	0	0	51	1	0	51	1	0	50	2	0
R-29	EW No. 5	5	ROW	Residential	1	49	50	50	0	1	B(67)	None	50	0	0	50	0	0	50	0	0	50	0	0	50	0	0	50	0	0
R-30	EW No. 5	5	ROW	Residential	1	48	49	50	1	2	B(67)	None	50	0	0	49	1	0	49	1	0	49	1	0	48	2	0	48	2	0
R-31	EW No. 4			Residential	2	44	44	45	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-32	EW No. 7	4	ROW/PL	Residential	1	50	51	52	1	2	B(67)	None	50	2	0	50	2	0	50	2	0	49	3	0	49	3	0	49	3	0
R-33	EW No. 7	4	ROW/PL	Residential	1	50	51	52	1	2	B(67)	None	51	1	0	51	1	0	51	1	0	51	1	0	50	2	0	50	2	0
R-34	EW No. 7			Residential	1	59	59	61	2	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-35	EW No. 7			Residential	1	58	59	60	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-36	EW No. 7			Residential	1	55	55	56	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-37	EW No. 5	5	ROW	Residential	2	56	56	57	1	1	B(67)	None	57	0	0	56	1	0	55	2	0	54	3	0	53	4	0	53	4	0
R-38	EW No. 5	5	ROW	Residential	1	61	62	63	1	2	B(67)	None	63	0	0	62	1	0	60	3	0	59	4	0	58	5	1	57	6	1
R-39	EW No. 5	5	ROW	Residential	1	64	64	65	1	1	B(67)	None	65	0	0	64	1	0	62	3	0	61	4	0	60	5	1	59	6	1
R-40	EW No. 5	5	ROW	Residential	1	65	**66**	**67**	1	2	B(67)	A/E	67	0	0	64	3	0	63	4	0	62	5	1	61	6	1	60	7	1
R-41	EW No. 8			Residential	2	62	62	63	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-42	EW No. 8			Residential	1	60	60	61	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-43	EW No. 8			Residential	1	61	61	62	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table B.1 – Predicted Future Noise and Noise Barrier Analysis

Receptor No.	Existing Wall No.	NB No.	Noise Barrier Location	Land Use	No. of Receptors /Units	Existing Noise Level, dBA L_{eq}(h)	Future Noise Levels, dBA L_{eq}(h) – 2040 Noise Level: Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus Without Project Conditions	With Project Minus Existing Conditions	Activity Category (NAC)	Impact Type	Noise Prediction with Barrier, Barrier I.L., and NBR – 6 ft: L_{eq}(h)	6 ft: I.L.[1]	6 ft: NBR	8 ft: L_{eq}(h)	8 ft: I.L.	8 ft: NBR	10 ft: L_{eq}(h)	10 ft: I.L.	10 ft: NBR	12 ft: L_{eq}(h)	12 ft: I.L.	12 ft: NBR	14 ft: L_{eq}(h)	14 ft: I.L.	14 ft: NBR	16 ft: L_{eq}(h)	16 ft: I.L.	16 ft: NBR
R-44	EW No. 8			Residential	2	60	60	61	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-45	EW No. 8			Residential	1	58	58	59	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-46	EW No. 9	6	ROW/PL	Residential	1	**66**	**66**	**68**	2	2	B(67)	A/E	68	0	0	64	4	0	61	7	1	60	8	1	59	9	1	58	10	1
R-47	EW No. 9	6	ROW/PL	Residential	2	59	59	60	1	1	B(67)	None	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0
R-48	EW No. 8			Residential	1	55	55	57	2	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-49	EW No. 8			Residential	1	54	54	55	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-50	EW No. 8			Residential	3	53	53	54	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-51				Park	1	**67**	**68**	**69**	1	2	C(67)	A/E	NF[6]	--	--	NF	--	--	NF	--	--	NF	--	--	NF	--	--	NF	--	--
R-52				Trail	1	63	63	65	2	2	C[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-53	EW No. 8			Residential	1	57	58	59	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-54	EW No. 8			Residential	1	57	58	59	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-55	EW No. 8			Residential	1	56	56	57	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-56	EW No. 8			Residential	1	55	55	56	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-57	EW No. 8			Residential	1	53	53	54	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-58	EW No. 8			Residential	1	59	60	61	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-59	EW No. 8			Residential	2	57	57	58	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-60	EW No. 8			Residential	4	55	55	56	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-61	EW No. 8			Residential	4	53	54	55	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-62				Trail	1	65	65	67	2	2	C[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-63	EW No. 8			Residential	1	56	56	57	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-64	EW No. 8			Residential	4	51	52	52	0	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-65	EW No. 8			Residential	2	51	51	52	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-66	EW No. 8			Residential	2	51	51	52	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-67	EW No. 8			Residential	2	51	51	52	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-68	EW No. 10			Residential	2	50	50	51	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-69	EW No. 10			Residential	3	54	54	55	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-70	EW No. 10			Residential	2	55	55	57	2	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-71	EW No. 10			Residential	1	56	56	58	2	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-72	EW No. 10			Residential	2	56	56	58	2	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-73	EW No. 10			Residential	1	50	50	51	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-74	EW No. 10			Residential	2	51	51	52	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-75	EW No. 10			Residential	2	51	51	52	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-76	EW No. 10			Residential	2	51	52	53	1	2	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-77	EW No. 10			Residential	1	51	51	52	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-78	EW No. 10			Residential	1	53	53	54	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-79	EW No. 11			Residential	2	65	65	65	0	0	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-80	EW No. 11			Residential	2	61	61	62	1	1	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-81	EW No. 11			Light Industrial	1	67	67	67	0	0	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-82				Light Industrial	1	67	67	67	0	0	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-83				Commercial	1	72	72	72	0	0	E[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-84				Vacant Land	1	68	68	68	0	0	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-85	EW No. 12			Commercial	1	64	64	65	1	1	E[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-86				Commercial	1	65	65	65	0	0	E[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table B.1 – Predicted Future Noise and Noise Barrier Analysis

Receptor No.	Existing Wall No.	NB No.	Noise Barrier Location	Land Use	No. of Receptors /Units	Existing Noise Level, dBA $L_{eq}(h)$	Future Noise Levels, dBA $L_{eq}(h)$																							
							2040 Noise Level				Activity Category (NAC)	Impact Type	Noise Prediction with Barrier, Barrier I.L., and NBR																	
													6 ft			8 ft			10 ft			12 ft			14 ft			16 ft		
							Without Project, dBA L_{eq}	With Project, dBA L_{eq}	With Project Minus Without Project Conditions	With Project Minus Existing Conditions			$L_{eq}(h)$	I.L.[1]	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR	$L_{eq}(h)$	I.L.	NBR
R-87				Residential	1	63	63	63	0	0	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-88				Residential	1	62	62	62	0	0	B(67)	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-89				Light Industrial	1	75	75	75	0	0	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-90				Light Industrial	1	64	64	64	0	0	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-91				Light Industrial	1	66	66	66	0	0	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
R-92				Light Industrial	1	69	70	70	0	1	F[2]	None	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Source: Compiled by LSA (2018).

1 I.L.: Insertion Loss.

2 Activity categories without outdoor frequent human use areas were not evaluated against the NAC.

3 No barrier was analyzed at this location because the modeled receptor would not approach or exceed the NAC.

4 Numbers in **bold** represent noise levels that approach or exceed the NAC.

5 Underlined noise levels have been attenuated by at least 5 dBA (i.e., feasible barrier height).

6 NF = Not Feasible.

A/E = Approach/Exceed
dB = decibel(s)
dBA = A-weighted decibel(s)
EW = Existing Wall
ft = foot/feet

$L_{eq}(h)$ = 1-hour A-weighted equivalent continuous sound level
NAC = Noise Abatement Criteria
NB = Noise Barrier
NBR = Number of Benefited Receptors
PL = property line
ROW = right-of-way

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Appendix C. Supplemental Data

This appendix contains the noise monitoring results and sound level calibration certifications.

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LONG-TERM NOISE LEVEL MEASUREMENTS

Noise Measurement Survey – 24 HR

Project Number: WKE1702
Project Name: Fairview Street Improvements

Test Personnel: Jason Lui
Equipment: Dosimeter

Site Number: LT-1 Date: 4/17-18/2018

Time: From 9:00 a.m. To 9:00 a.m.

Site Location: 1008 King Street. In the backyard.

Primary Noise Sources: Traffic on Fairview Street.

Comments: Residence has dog, but was temporarily relocated to side yard. Children did not play in the backyard. Activities in the backyard were minimized.

Diagram:

Location Photo:

Noise Measurement Survey – 24 HR

Project Number: WKE1702
Test Personnel: Daniel Kaufman
Project Name: Fairview Street Improvements
Equipment: Dosimeter

Site Number: LT-2 Date: 4/18-19/2018
Time: From 9:00 a.m. To 9:00 a.m.

Site Location: 2505 West 16th Street. In front of the house, on a light post southeast of the home.

Primary Noise Sources: Traffic on Fairview Street.

Comments:

Sketch:

Location Photo:

SHORT-TERM NOISE LEVEL MEASUREMENTS

Noise Measurement Survey

Project Number: WKE1702 Test Personnel: Logan Freeberg
Project Name: Fairview Street Improvements Equipment: Larson Davis 820

Site Number: ST-1 Date: 4/17/2018 Time: From 9:23AM To 9:43AM

Site Location: 2234 West 9th Street in the residence backyard.

Primary Noise Sources: Traffic on Fairview Street, birds and rooster crowing.

Measurement Results	
	dBA
L_{eq}	63.4
L_{max}	76.1
L_{min}	50.2
L_{peak}	90.4
L_2	68.7
L_8	66.8
L_{25}	64.7
L_{50}	61.8

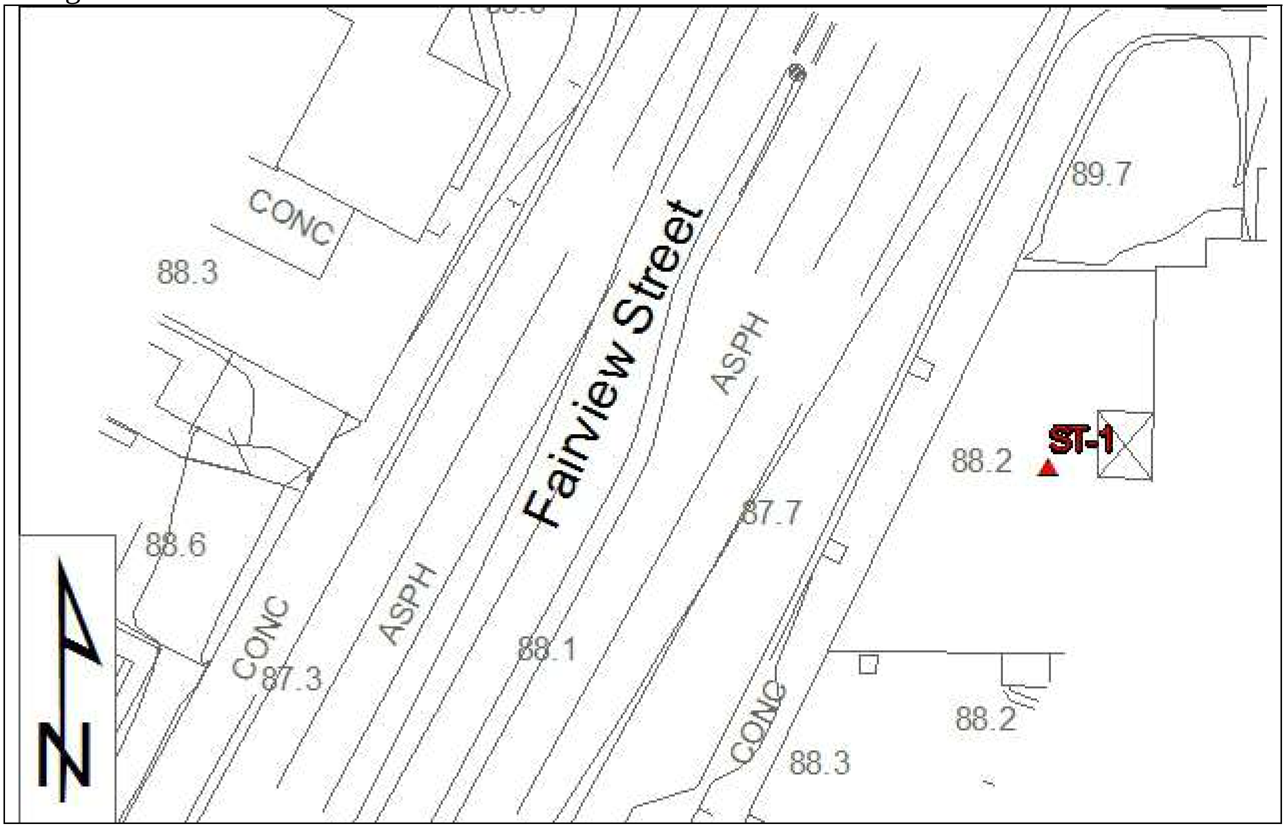
Atmospheric Conditions	
Average Wind Velocity (mph)	3.1
Maximum Wind Velocity (mph)	1.6
Temperature (F)	58.0
Relative Humidity (%)	35.9

Comments: Residence wall = 6 blocks @ 8 inches each with 1 topper @ 8 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St	2/2	45 mph	280	10	6	340	19	5

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Jason Lui
Project Name: Fairview Street Improvements
Equipment: Larson Davis 824

Site Number: ST-2 Date: 4/17/2018
Time: From 9:23AM To 9:43AM

Site Location: 2507 9th Street in residence backyard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	63.8
L_{max}	71.3
L_{min}	47.6
L_{peak}	83.4
L_2	67.6
L_8	66.6
L_{25}	65.2
L_{50}	63.4

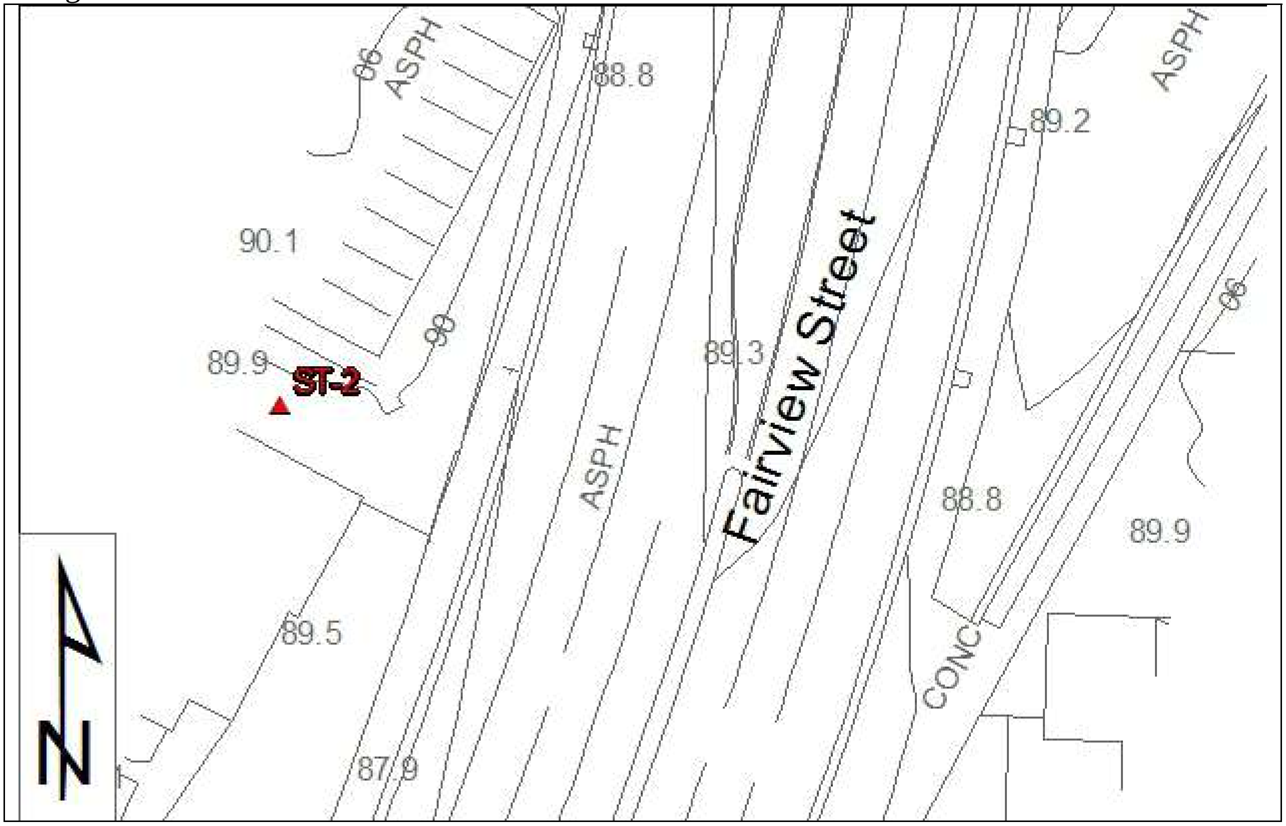
Atmospheric Conditions	
Average Wind Velocity (mph)	3.3
Maximum Wind Velocity (mph)	0.9
Temperature (F)	59.0
Relative Humidity (%)	36.5

Comments: Back wall = 8 blocks @ 8 inches each. Side wall = 7.5 blocks @ 8 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St	2/2	45 mph	280	10	6	340	19	5

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Daniel Kaufman
Project Name: Fairview Street Improvements
Equipment: Larson Davis 831

Site Number: ST-3 Date: 4/17/2018
Time: From 9:23AM To 9:43AM

Site Location: 1908 King Street in residence back yard.

Primary Noise Sources: Traffic on Fairview Street and birds.

Measurement Results	
	dBA
L_{eq}	64.9
L_{max}	74.5
L_{min}	47.3
L_{peak}	85.0
L_2	69.9
L_8	68.3
L_{25}	66.2
L_{50}	64.2

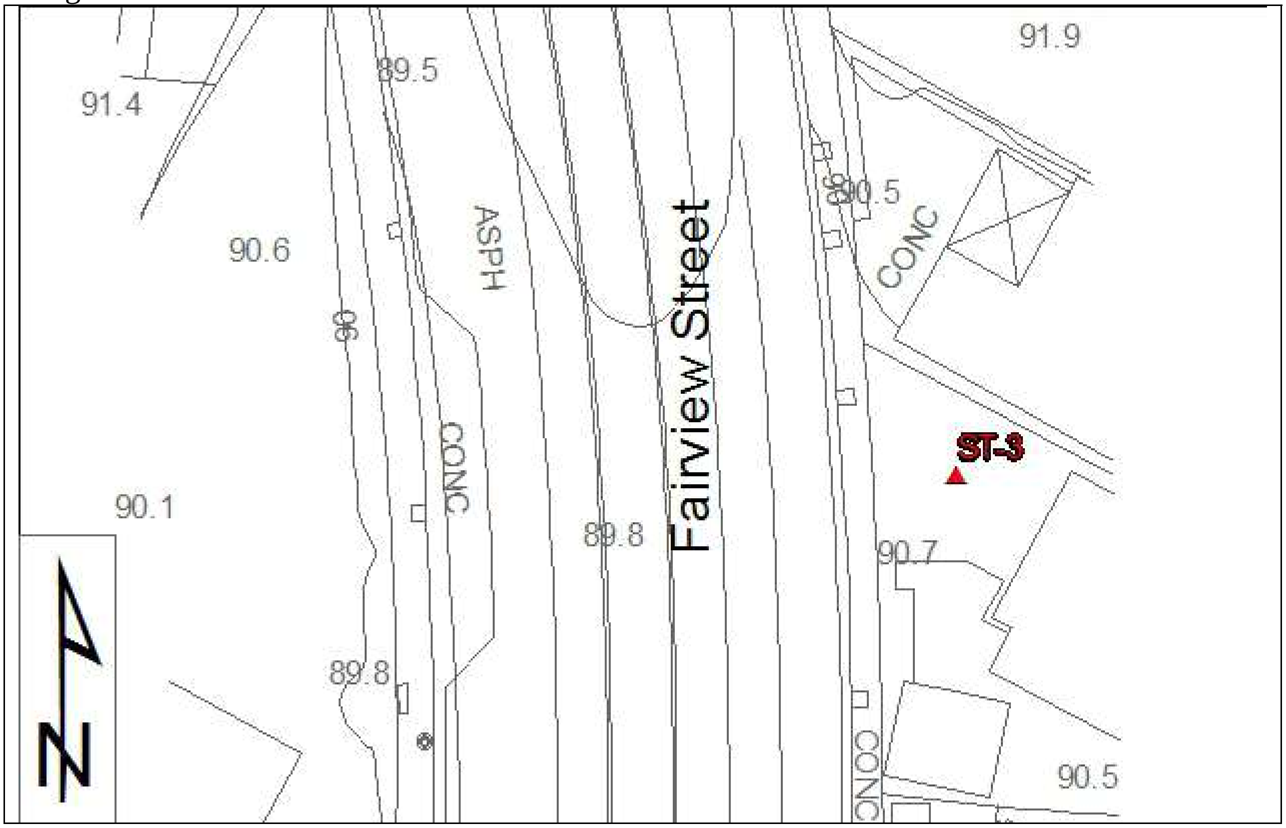
Atmospheric Conditions	
Average Wind Velocity (mph)	2.5
Maximum Wind Velocity (mph)	0.6
Temperature (F)	67.4
Relative Humidity (%)	26.4

Comments: Northern neighbor wall = 6 blocks @ 8 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St	2/2	45 mph	280	10	6	340	19	5

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Logan Freeberg
Project Name: Fairview Street Improvements
Equipment: Larson Davis 820

Site Number: ST-4 Date: 4/17/2018
Time: From 10:28AM To 10:48AM

Site Location: 1007 Marengo Place in residence back yard.

Primary Noise Sources: Traffic on Fairview Street and birds.

Measurement Results	
	dBA
L_{eq}	67.3
L_{max}	81.3
L_{min}	46.4
L_{peak}	94.4
L_2	73.0
L_8	70.6
L_{25}	68.6
L_{50}	66.3

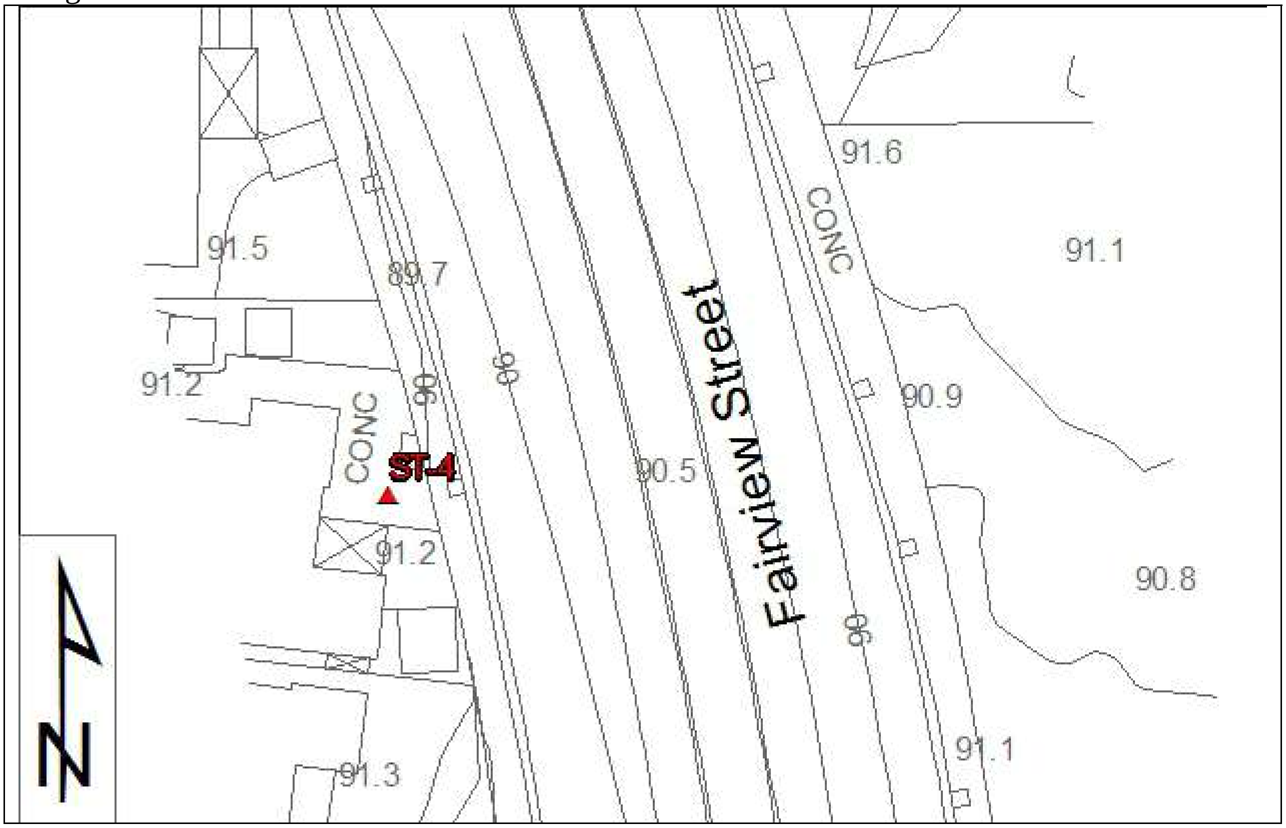
Atmospheric Conditions	
Average Wind Velocity (mph)	2.5
Maximum Wind Velocity (mph)	1.2
Temperature (F)	68.5
Relative Humidity (%)	28.4

Comments: Wood slat fence about 6 feet high. The gaps have been covered with other pieces of fencing. Large Cypress trees along fenceline bordering Fairview St.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	305	11	4	313	12	6

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Jason Lui
Project Name: Fairview Street Improvements
Equipment: Larson Davis 824

Site Number: ST-5 Date: 4/17/2018
Time: From 10:28AM To 10:48AM

Site Location: 2332 West 12th Street in residence backyard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	65.6
L_{max}	74.7
L_{min}	45.3
L_{peak}	85.7
L_2	70.5
L_8	69.0
L_{25}	67.2
L_{50}	64.8

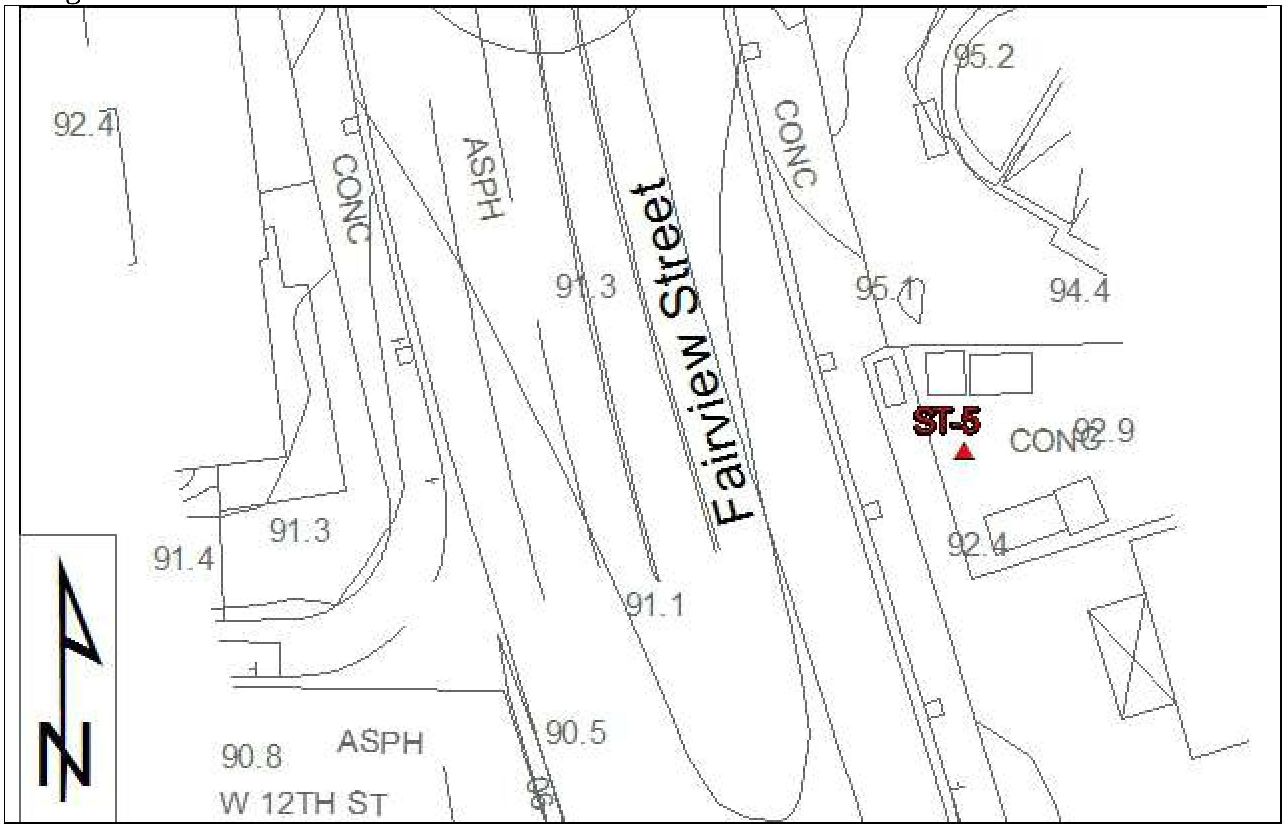
Atmospheric Conditions	
Average Wind Velocity (mph)	2.4
Maximum Wind Velocity (mph)	0.9
Temperature (F)	70.4
Relative Humidity (%)	26.4

Comments: Vacant land wall = 12 blocks @ 6 inches each. Residential wall = 11 blocks @ 6 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	305	11	4	313	12	6

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Jason Lui
Project Name: Fairview Street Improvements
Equipment: Larson Davis 824

Site Number: ST-6 Date: 4/17/2018
Time: From 11:36AM To 11:56AM

Site Location: 2503 West 12th Street in residence backyard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	64.7
L_{max}	79.5
L_{min}	41.7
L_{peak}	92.7
L_2	70.0
L_8	68.0
L_{25}	66.0
L_{50}	63.5

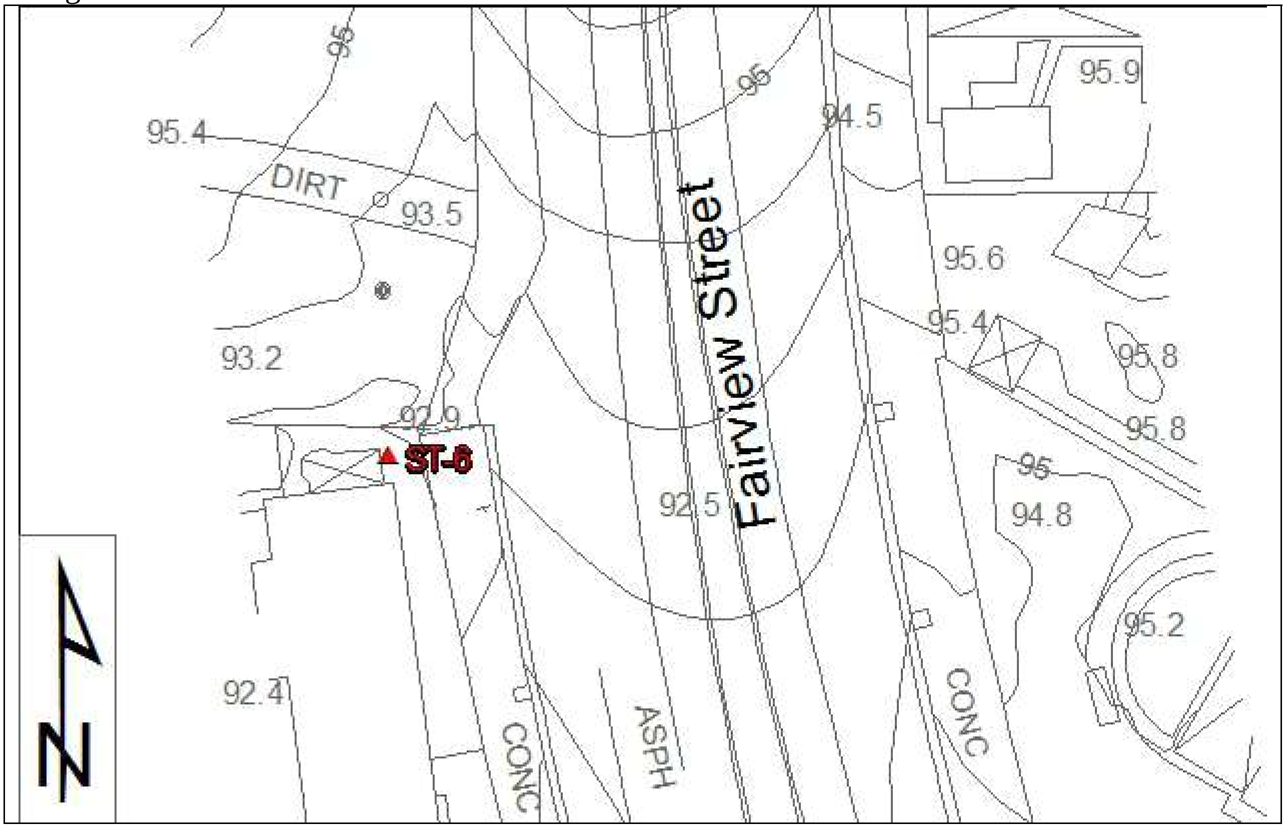
Atmospheric Conditions	
Average Wind Velocity (mph)	4.3
Maximum Wind Velocity (mph)	1.0
Temperature (F)	77.3
Relative Humidity (%)	70.2

Comments: Side wall = 12 blocks @ 6 inches each. Back wall = 8.5 blocks @ 8 inches each.

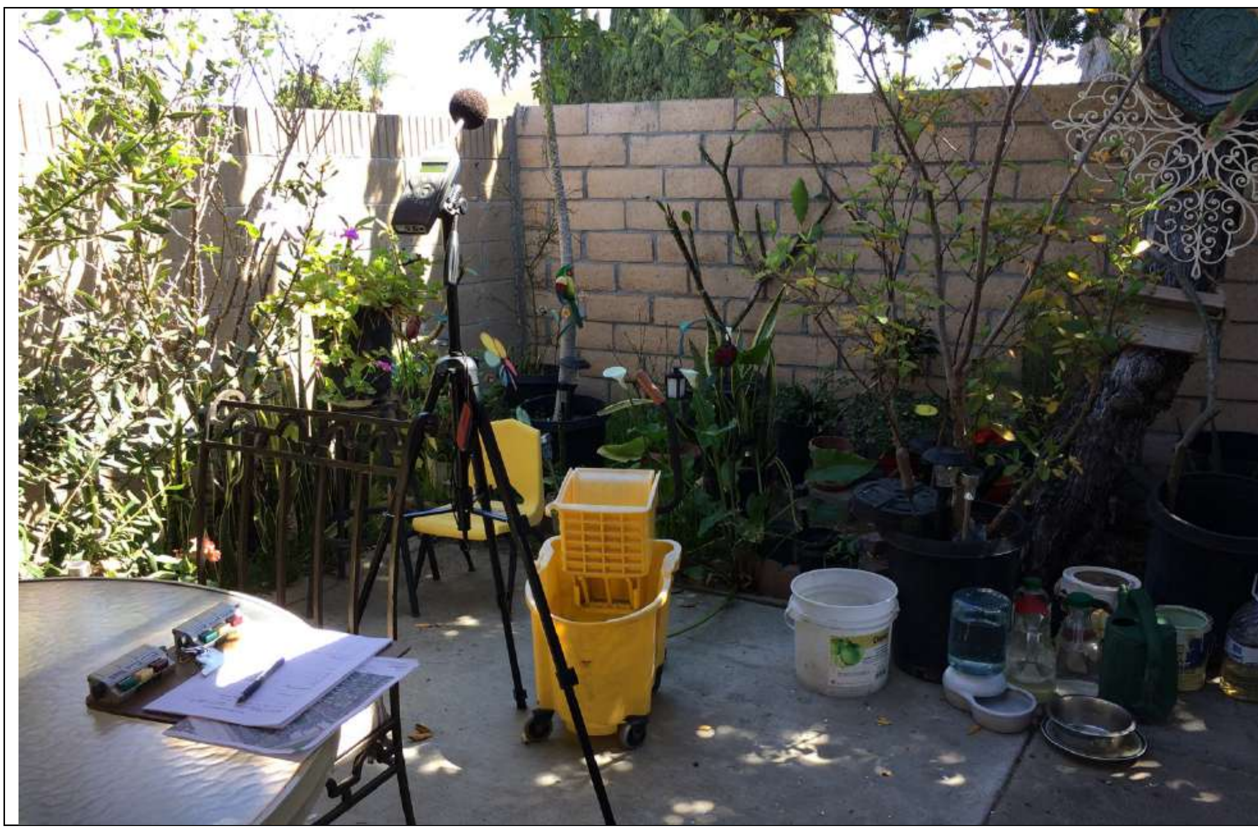
Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	313	5	6	307	8	3

Diagram:



Location Photo:



Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Akshay Newgi
Project Name: Fairview Street Improvements
Equipment: Larson Davis 820

Site Number: ST-7 Date: 5/10/2018
Time: From 11:10AM To 11:30AM

Site Location: In Fairview Triangle Habitat Restoration park.

Primary Noise Sources: Traffic on Fairview Street. Birds and wind.

Measurement Results	
	dBA
L_{eq}	66.7
L_{max}	81.1
L_{min}	41.6
L_{peak}	92.4
L_{2}	71.7
L_{8}	70.4
L_{25}	68.2
L_{50}	65.2

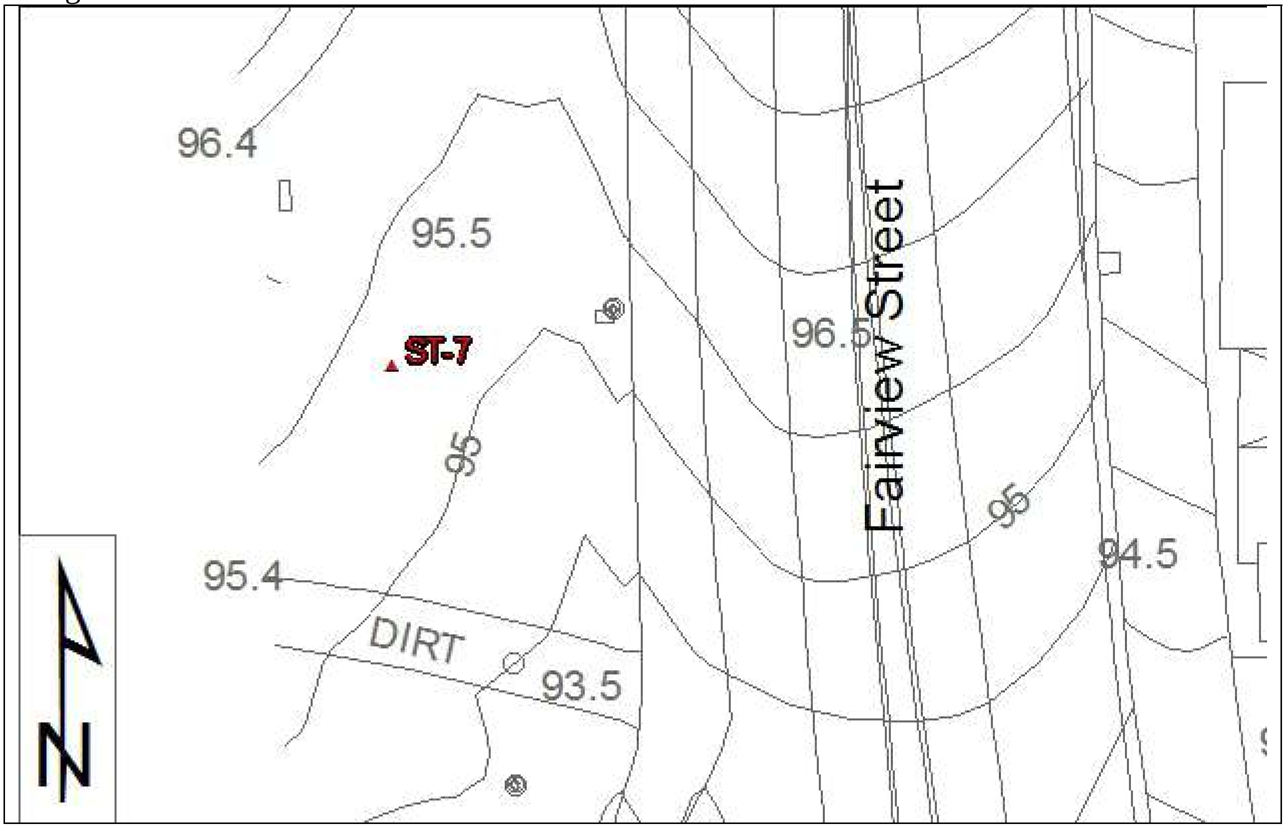
Atmospheric Conditions	
Average Wind Velocity (mph)	3
Maximum Wind Velocity (mph)	6
Temperature (F)	71
Relative Humidity (%)	60

Comments:

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	270	11	3	320	6	7

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Daniel Kaufman
Project Name: Fairview Street Improvements
Equipment: Larson Davis 831

Site Number: ST-8 Date: 4/17/2018
Time: From 10:28AM To 10:48AM

Site Location: 2413 West Washington Avenue in residence back yard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	56.7
L_{max}	67.6
L_{min}	36.1
L_{peak}	79.3
L_2	62.3
L_8	60.3
L_{25}	58.1
L_{50}	55.4

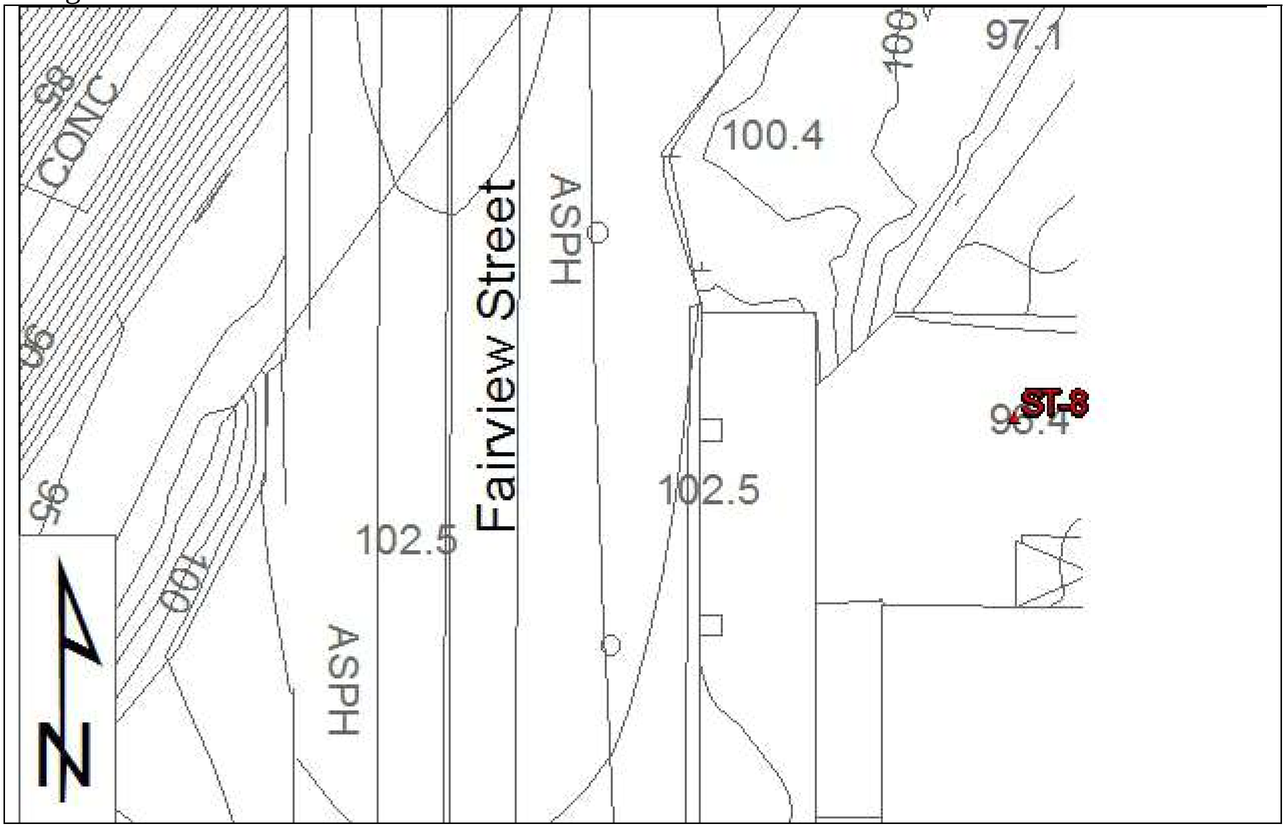
Atmospheric Conditions	
Average Wind Velocity (mph)	2.8
Maximum Wind Velocity (mph)	1.0
Temperature (F)	72.5
Relative Humidity (%)	23.1

Comments:

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	305	11	4	313	12	6

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Jason Lui
Project Name: Fairview Street Improvements
Equipment: Larson Davis 824

Site Number: ST-9 Date: 4/17/2018
Time: From 1:53PM To 2:14PM

Site Location: 1322 Fair Way in residence back yard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	55.7
L_{max}	66.5
L_{min}	40.3
L_{peak}	81.4
L_2	60.3
L_8	58.9
L_{25}	57.1
L_{50}	54.9

Atmospheric Conditions	
Average Wind Velocity (mph)	2.5
Maximum Wind Velocity (mph)	0.8
Temperature (F)	78.8
Relative Humidity (%)	77.5

Comments: Back wall = 8.5 blocks @ 8 inches each. South wall = 8.5 blocks @ 8 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	473	14	4	361	14	3

Diagram:

Location Photo:

Noise Measurement Survey

Project Number: WKE1702 Test Personnel: Daniel Kaufman
Project Name: Fairview Street Improvements Equipment: Larson Davis 831

Site Number: ST-10 Date: 4/17/2018 Time: From 1:54PM To 2:14PM

Site Location: 1334 Fair Way in front of residence back yard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	53.3
L_{max}	71.2
L_{min}	41.5
L_{peak}	95.8
L_2	58.6
L_8	56.5
L_{25}	54.3
L_{50}	52.2

Atmospheric Conditions	
Average Wind Velocity (mph)	6.4
Maximum Wind Velocity (mph)	2.3
Temperature (F)	75.0
Relative Humidity (%)	27.4

Comments: Outer wall = Eight 8 inch blocks with topper. Inner wall = Nine 8 inch blocks with topper.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	473	14	4	361	14	3

Diagram:

Location Photo:

Noise Measurement Survey

Project Number: WKE1702

Project Name: Fairview Street Improvements

Test Personnel: Jason Lui

Equipment: Larson Davis 824

Site Number: ST-11 Date: 4/17/2018

Time: From 12:19PM To 12:39PM

Site Location: 1321 Glenarbor Street in residence back yard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	50.0
L_{max}	75.0
L_{min}	37.2
L_{peak}	91.5
L_2	55.8
L_8	52.3
L_{25}	50.0
L_{50}	47.7

Atmospheric Conditions	
Average Wind Velocity (mph)	4.9
Maximum Wind Velocity (mph)	0.9
Temperature (F)	73.6
Relative Humidity (%)	77.0

Comments: Back wall = 10 blocks @ 8 inches each. North wall = 7 blocks @ 8 inches each + planter = 1.5 block @ 8 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	359	17	3	326	9	3

Diagram:

Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Daniel Kaufman
Project Name: Fairview Street Improvements
Equipment: Larson Davis 831

Site Number: ST-12 Date: 4/17/2018
Time: From 12:19PM To 12:39PM

Site Location: 1413 North Glenarbor Street in residence back yard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	54.5
L_{max}	67.5
L_{min}	37.8
L_{peak}	96.0
L_2	60.1
L_8	58.3
L_{25}	55.7
L_{50}	52.7

Atmospheric Conditions	
Average Wind Velocity (mph)	5.1
Maximum Wind Velocity (mph)	1.4
Temperature (F)	75.5
Relative Humidity (%)	26.0

Comments: Eastern wall = 10 blocks @ 8 inches each + 6 inch topper. Northern wall = 9 blocks @ 8 inches each. Southern wall = 10 blocks @ 8 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	359	17	3	326	9	3

Diagram:

Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Jason Lui
Project Name: Fairview Street Improvements
Equipment: Larson Davis 824

Site Number: ST-13 Date: 4/17/2018
Time: From 1:12PM To 1:32PM

Site Location: 1417 Glenarbor Street in residence backyard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	55.7
L_{max}	67.9
L_{min}	39.8
L_{peak}	84.3
L_2	61.5
L_8	58.9
L_{25}	57.0
L_{50}	54.7

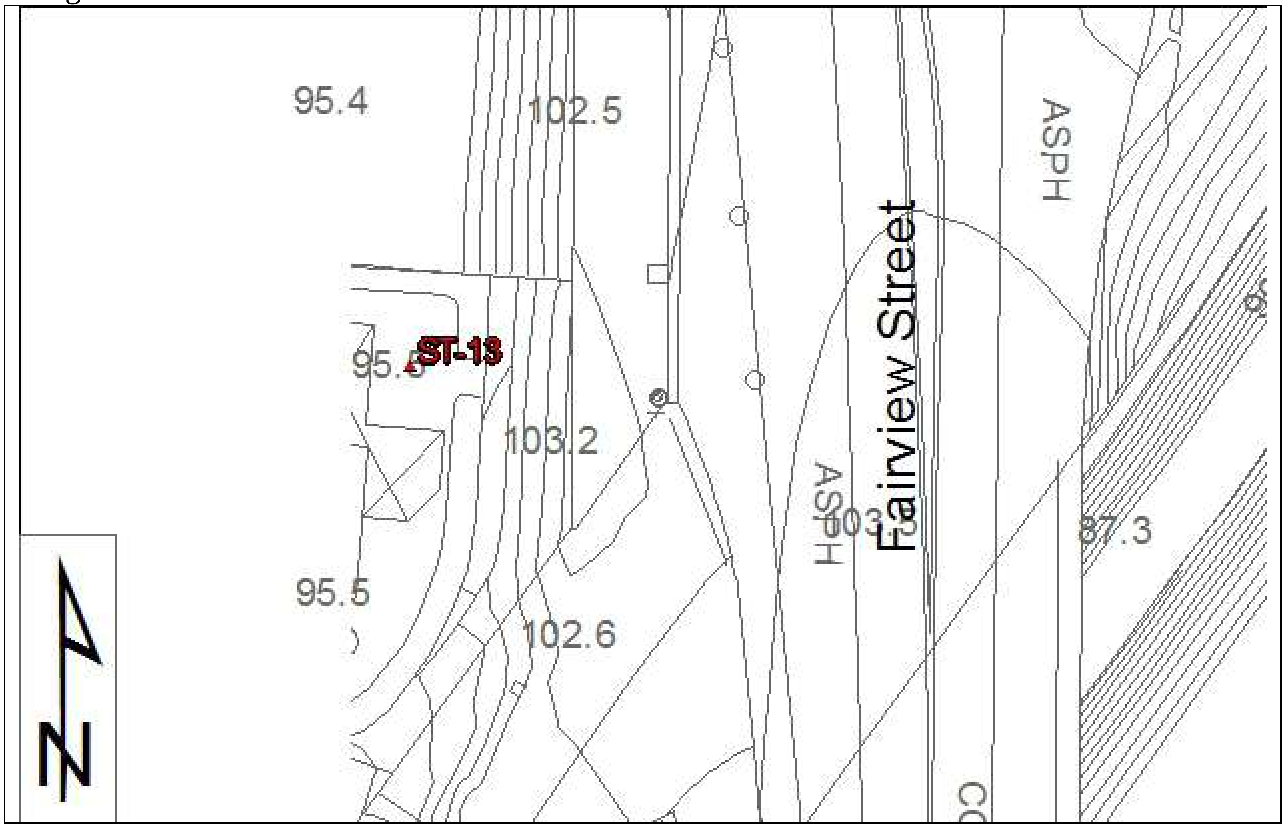
Atmospheric Conditions	
Average Wind Velocity (mph)	6.3
Maximum Wind Velocity (mph)	1.7
Temperature (F)	75.4
Relative Humidity (%)	76.5

Comments: Back wall = 10.5 blocks @ 8 inches each. North wall = 8 blocks @ 8 inches each + 5 planter blocks. South wall = 7 blocks @ 8 inches each + 5 planter blocks. Approximately 8-10 feet down.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	377	33	6	378	15	2
17th St.	3/3	45 mph	272	8	4	260	3	3

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Test Personnel: Akshay Newgi
Project Name: Fairview Street Improvements
Equipment: Larson Davis 820

Site Number: ST-14 Date: 5/10/2018
Time: From 12:10 PM To 12:30 PM

Site Location: 2501 16th Street in residence front yard.

Primary Noise Sources: Traffic on Fairview Street and light traffic on 16th Street.

Measurement Results	
	dBA
L_{eq}	63.0
L_{max}	75.2
L_{min}	48.0
L_{peak}	87.2
L_2	69.4
L_8	66.5
L_{25}	64.1
L_{50}	61.5

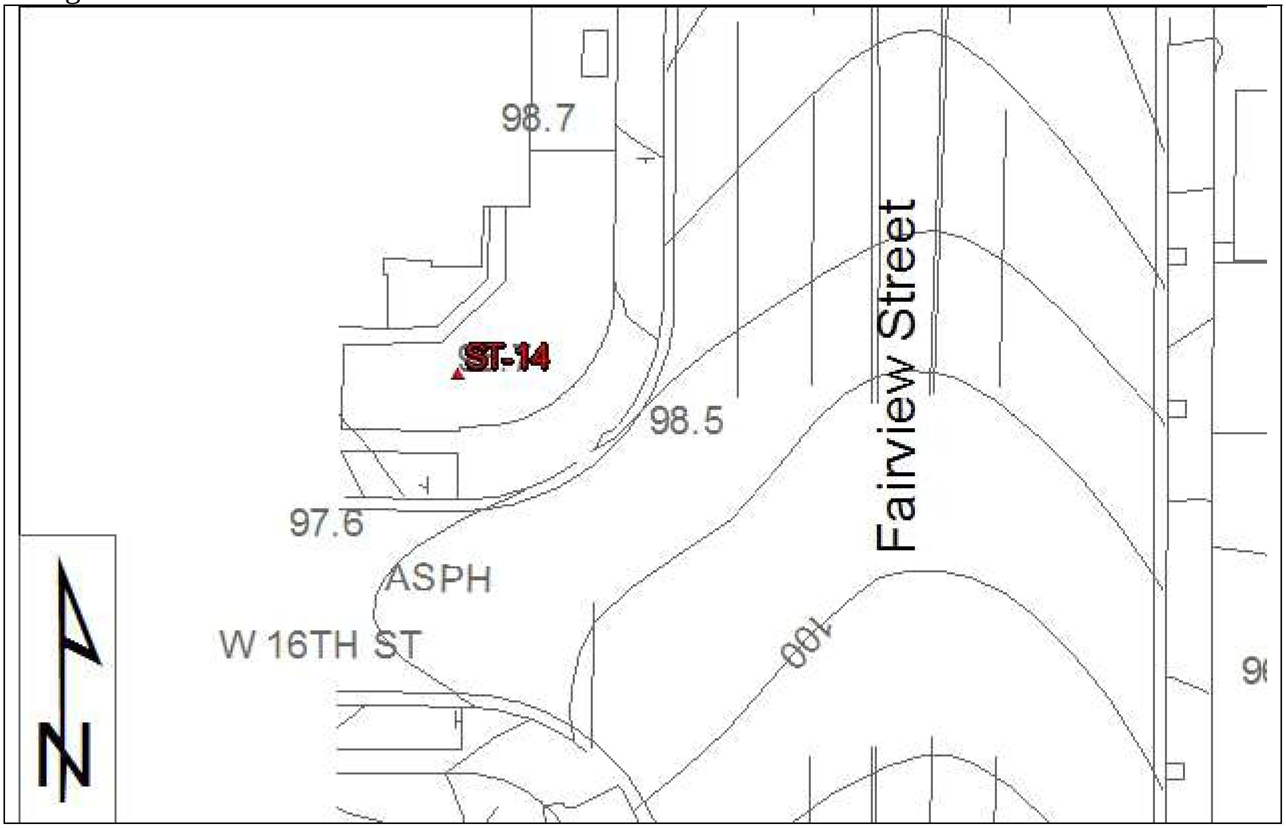
Atmospheric Conditions	
Average Wind Velocity (mph)	3
Maximum Wind Velocity (mph)	6
Temperature (F)	71
Relative Humidity (%)	60

Comments: Residence wall = 11 blocks @7 inches each.

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	300	8	2	280	7	10
17th St.	3/3	45 mph	280	2	3	310	4	4

Diagram:



Location Photo:

Noise Measurement Survey

Project Number: WKE1702
Project Name: Fairview Street Improvements

Test Personnel: Daniel Kaufman
Equipment: Larson Davis 831

Site Number: ST-15 Date: 4/17/2018

Time: From 1:12PM To 1:32PM

Site Location: South of 1609 Fairview Street in front yard.

Primary Noise Sources: Traffic on Fairview Street.

Measurement Results	
	dBA
L_{eq}	74.0
L_{max}	92.5
L_{min}	53.5
L_{peak}	103.9
L_2	82.0
L_8	77.9
L_{25}	73.7
L_{50}	70.1

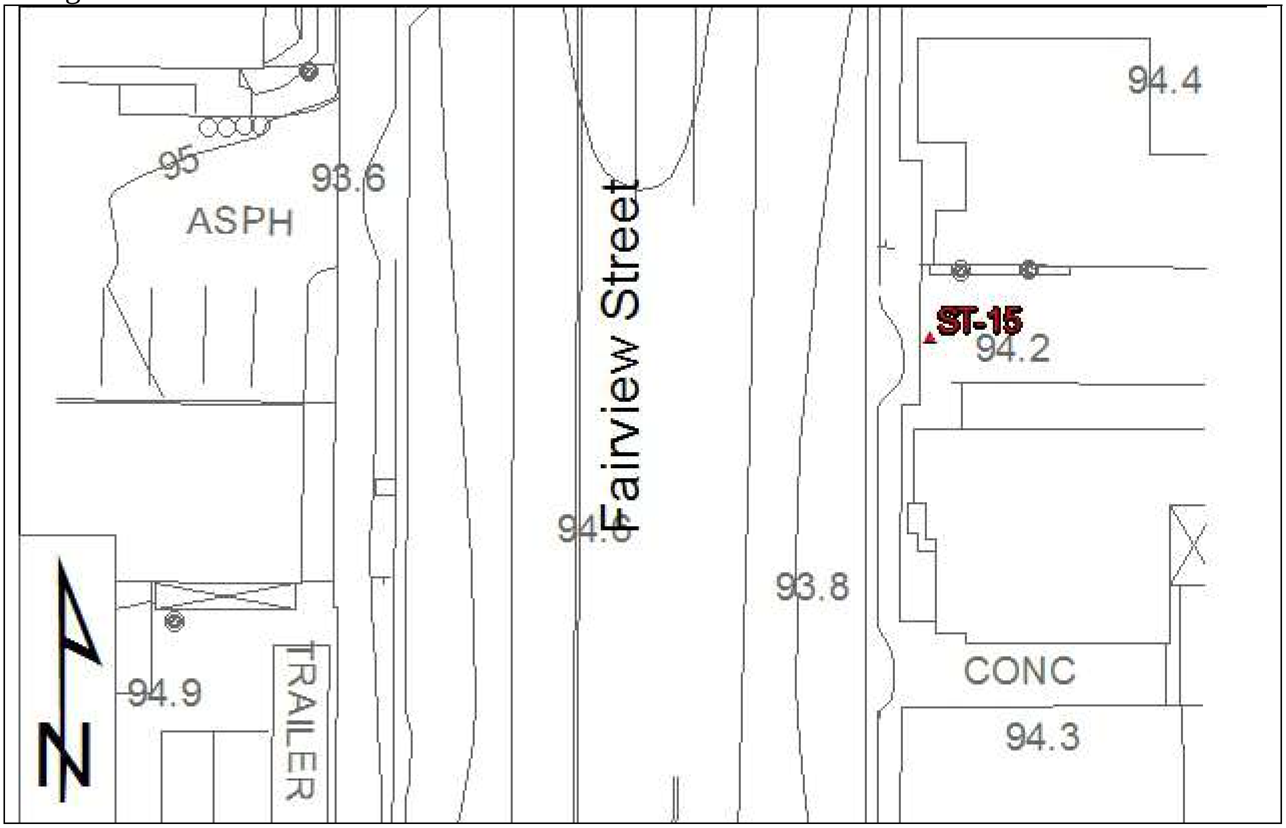
Atmospheric Conditions	
Average Wind Velocity (mph)	4.4
Maximum Wind Velocity (mph)	1.3
Temperature (F)	70.9
Relative Humidity (%)	25.4

Comments:

Traffic Description:

Roadway	# Lanes	Speeds	NB/EB Counts			SB/WB Counts		
			Auto	MT	HT	Auto	MT	HT
Fairview St.	2/2	45 mph	377	33	6	378	15	2
17th St.	3/3	45 mph	272	8	4	260	3	3

Diagram:



Location Photo:

CALIBRATION CERTIFICATE FOR LARSON DAVIS 820

PCB PIEZOTRONICS
A PCB GROUP COMPANY

Certificate of Calibration and Conformance

Certificate Number 2017-205567

Instrument Model 820, Serial Number 1584, was calibrated on 28 Aug 2017. The instrument meets factory specifications per Procedure D0001.8160, ANSI S1.4 1983, IEC 651-Type 1 1979, and IEC 804-Type 1 1985.

Instrument found to be in calibration as received: YES
Date Calibrated: 28 Aug 2017
Calibration due: 28 Aug 2018

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	19 Dec 2017	2016-204448

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 31 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.
Tested with PRM828 S/N 2484

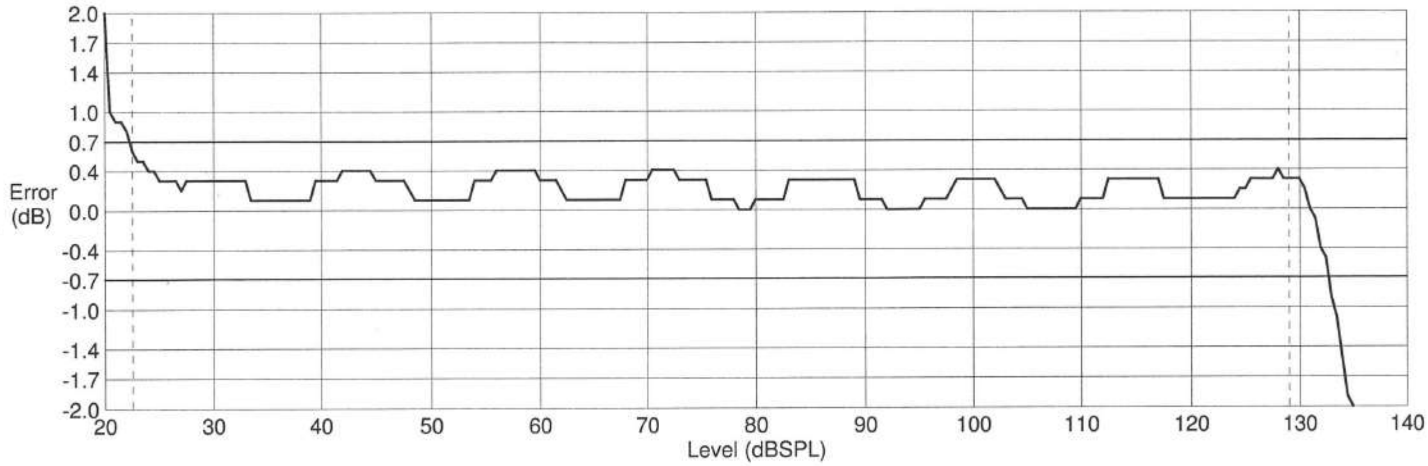
Signed: Sean Childs

Technician: Sean Childs

Provo Engineering and Manufacturing Center, 1681 West 820 North, Provo, Utah 84601
Toll Free: 888.258.3222 Telephone: 716.926.8243 Fax: 716.926.8215
ISO 9001-2008 Certified

Sound Level Meter Model: 820A Serial Number: A1584
Log Linearity, Differential Linearity and Range Data

This Type 1 Sound Level Meter (including attached PRM828 preamplifier and ADP005 18 pF input adapter) was calibrated with a reference 1kHz sine wave at a level of 114.0 dBSPL. The instrument's Log Linearity A-weighted slow response was then electrically tested using a 1kHz sine wave from 18.0 dBSPL to 138.0 dBSPL in 0.5 dB increments.



Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB	Levl dBSPL	Meas dBSPL	Err dB
18.0	**20.1**	**2.1**	38.5	38.6	0.1	59.0	59.4	0.4	79.5	79.5	0.0	100.0	100.3	0.3	120.5	120.6	0.1
18.5	**20.4**	**1.9**	39.0	39.1	0.1	59.5	59.9	0.4	80.0	80.1	0.1	100.5	100.8	0.3	121.0	121.1	0.1
19.0	**20.6**	**1.6**	39.5	39.8	0.3	60.0	60.3	0.3	80.5	80.6	0.1	101.0	101.3	0.3	121.5	121.6	0.1
19.5	**20.9**	**1.4**	40.0	40.3	0.3	60.5	60.8	0.3	81.0	81.1	0.1	101.5	101.8	0.3	122.0	122.1	0.1
20.0	**21.2**	**1.2**	40.5	40.8	0.3	61.0	61.3	0.3	81.5	81.6	0.1	102.0	102.3	0.3	122.5	122.6	0.1
20.5	**21.5**	**1.0**	41.0	41.3	0.3	61.5	61.8	0.3	82.0	82.1	0.1	102.5	102.7	0.2	123.0	123.1	0.1
21.0	**21.9**	**0.9**	41.5	41.8	0.3	62.0	62.2	0.2	82.5	82.6	0.1	103.0	103.1	0.1	123.5	123.6	0.1
21.5	**22.4**	**0.9**	42.0	42.4	0.4	62.5	62.6	0.1	83.0	83.3	0.3	103.5	103.6	0.1	124.0	124.1	0.1
22.0	**22.8**	**0.8**	42.5	42.9	0.4	63.0	63.1	0.1	83.5	83.8	0.3	104.0	104.1	0.1	124.5	124.7	0.2
22.5	23.1	0.6	43.0	43.4	0.4	63.5	63.6	0.1	84.0	84.3	0.3	104.5	104.6	0.1	125.0	125.2	0.2
23.0	23.5	0.5	43.5	43.9	0.4	64.0	64.1	0.1	84.5	84.8	0.3	105.0	105.0	0.0	125.5	125.8	0.3
23.5	24.0	0.5	44.0	44.4	0.4	64.5	64.6	0.1	85.0	85.3	0.3	105.5	105.5	0.0	126.0	126.3	0.3
24.0	24.4	0.4	44.5	44.9	0.4	65.0	65.1	0.1	85.5	85.8	0.3	106.0	106.0	0.0	126.5	126.8	0.3
24.5	24.9	0.4	45.0	45.3	0.3	65.5	65.6	0.1	86.0	86.3	0.3	106.5	106.5	0.0	127.0	127.3	0.3
25.0	25.3	0.3	45.5	45.8	0.3	66.0	66.1	0.1	86.5	86.8	0.3	107.0	107.0	0.0	127.5	127.8	0.3
25.5	25.8	0.3	46.0	46.3	0.3	66.5	66.6	0.1	87.0	87.3	0.3	107.5	107.5	0.0	128.0	128.4	0.4
26.0	26.3	0.3	46.5	46.8	0.3	67.0	67.1	0.1	87.5	87.8	0.3	108.0	108.0	0.0	128.5	128.8	0.3
26.5	26.8	0.3	47.0	47.3	0.3	67.5	67.6	0.1	88.0	88.3	0.3	108.5	108.5	0.0	129.0	129.3	0.3
27.0	27.2	0.2	47.5	47.8	0.3	68.0	68.3	0.3	88.5	88.8	0.3	109.0	109.0	0.0	**129.5**	**129.8**	**0.3**
27.5	27.8	0.3	48.0	48.2	0.2	68.5	68.8	0.3	89.0	89.3	0.3	109.5	109.5	0.0	**130.0**	**130.3**	**0.3**
28.0	28.3	0.3	48.5	48.6	0.1	69.0	69.3	0.3	89.5	89.6	0.1	110.0	110.1	0.1	**130.5**	**130.7**	**0.2**
28.5	28.8	0.3	49.0	49.1	0.1	69.5	69.8	0.3	90.0	90.1	0.1	110.5	110.6	0.1	**131.0**	**131.0**	**0.0**
29.0	29.3	0.3	49.5	49.6	0.1	70.0	70.3	0.3	90.5	90.6	0.1	111.0	111.1	0.1	**131.5**	**131.4**	**−0.1**
29.5	29.8	0.3	50.0	50.1	0.1	70.5	70.9	0.4	91.0	91.1	0.1	111.5	111.6	0.1	**132.0**	**131.6**	**−0.4**
30.0	30.3	0.3	50.5	50.6	0.1	71.0	71.4	0.4	91.5	91.6	0.1	112.0	112.1	0.1	**132.5**	**132.0**	**−0.5**
30.5	30.8	0.3	51.0	51.1	0.1	71.5	71.9	0.4	92.0	92.0	0.0	112.5	112.8	0.3	**133.0**	**132.1**	**−0.9**
31.0	31.3	0.3	51.5	51.6	0.1	72.0	72.4	0.4	92.5	92.5	0.0	113.0	113.3	0.3	**133.5**	**132.4**	**−1.1**
31.5	31.8	0.3	52.0	52.1	0.1	72.5	72.9	0.4	93.0	93.0	0.0	113.5	113.8	0.3	**134.0**	**132.5**	**−1.5**
32.0	32.3	0.3	52.5	52.6	0.1	73.0	73.3	0.3	93.5	93.5	0.0	114.0	114.3	0.3	**134.5**	**132.6**	**−1.9**
32.5	32.8	0.3	53.0	53.1	0.1	73.5	73.8	0.3	94.0	94.0	0.0	114.5	114.8	0.3	**135.0**	**132.6**	**−2.4**
33.0	33.3	0.3	53.5	53.6	0.1	74.0	74.3	0.3	94.5	94.5	0.0	115.0	115.3	0.3	**135.5**	**132.6**	**−2.9**
33.5	33.6	0.1	54.0	54.3	0.3	74.5	74.8	0.3	95.0	95.0	0.0	115.5	115.8	0.3	**136.0**	**132.6**	**−3.4**
34.0	34.1	0.1	54.5	54.8	0.3	75.0	75.3	0.3	95.5	95.6	0.1	116.0	116.3	0.3	**136.5**	**132.5**	**−4.0**
34.5	34.6	0.1	55.0	55.3	0.3	75.5	75.8	0.3	96.0	96.1	0.1	116.5	116.8	0.3	**137.0**	**132.5**	**−4.5**
35.0	35.1	0.1	55.5	55.8	0.3	76.0	76.1	0.1	96.5	96.6	0.1	117.0	117.3	0.3	**137.5**	**132.6**	**−4.9**
35.5	35.6	0.1	56.0	56.4	0.4	76.5	76.6	0.1	97.0	97.1	0.1	117.5	117.6	0.1	**138.0**	**132.6**	**−5.4**
36.0	36.1	0.1	56.5	56.9	0.4	77.0	77.1	0.1	97.5	97.6	0.1	118.0	118.1	0.1			
36.5	36.6	0.1	57.0	57.4	0.4	77.5	77.6	0.1	98.0	98.2	0.2	118.5	118.6	0.1			
37.0	37.1	0.1	57.5	57.9	0.4	78.0	78.1	0.1	98.5	98.8	0.3	119.0	119.1	0.1			
37.5	37.6	0.1	58.0	58.4	0.4	78.5	78.5	0.0	99.0	99.3	0.3	119.5	119.6	0.1			
38.0	38.1	0.1	58.5	58.9	0.4	79.0	79.0	0.0	99.5	99.8	0.3	120.0	120.1	0.1			

Plotted per typical sensitivity of a 2541 microphone; 44.5 mV/Pa & 17.1 pF.

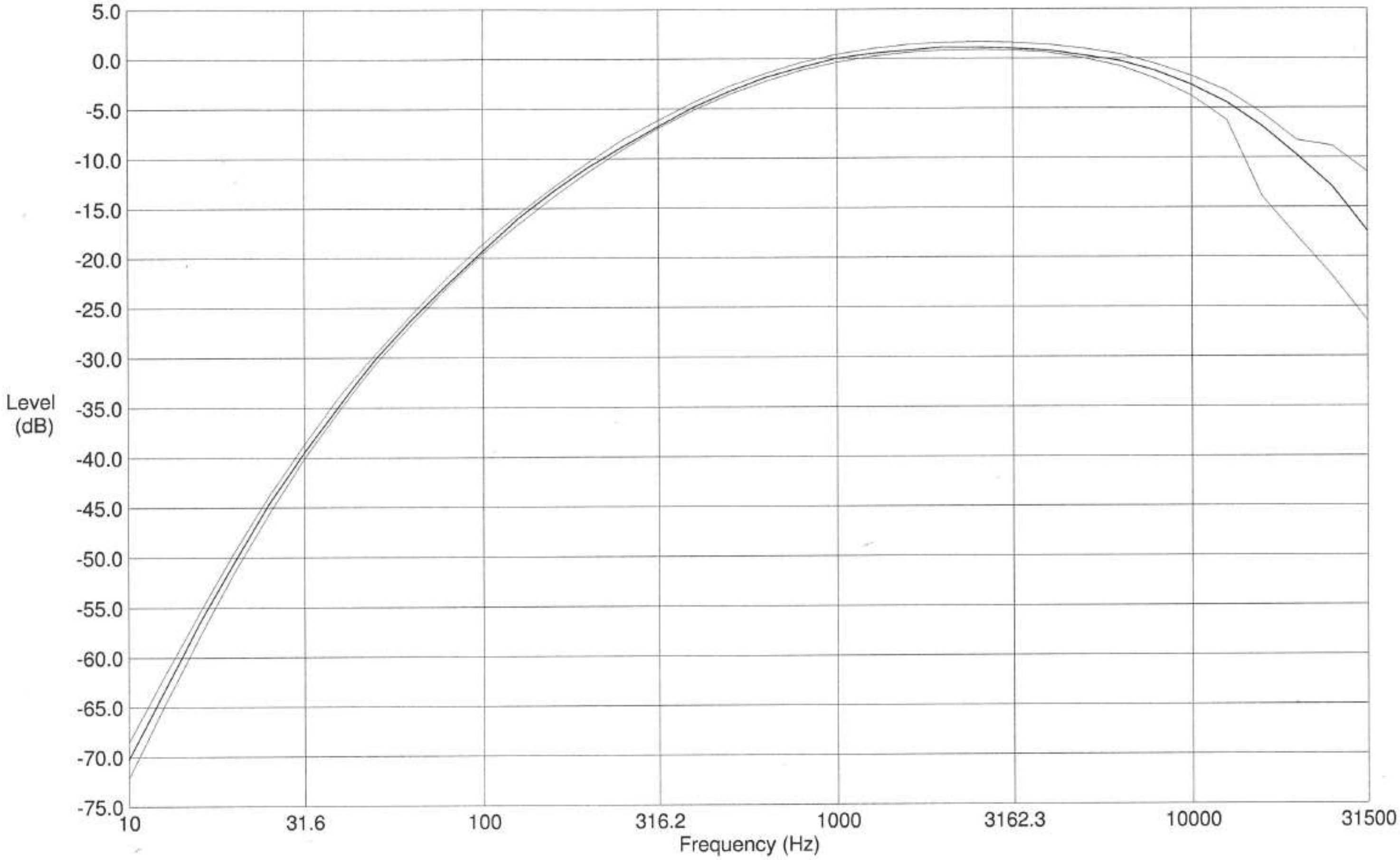
Overload occurs at 129.1 dBSPL.
Primary indicator range: 106.5 dB (lower limit: 22.5 dBSPL to upper limit: 129.0 dBSPL).
Dynamic range: 112.1 dB (noise floor: 16.9 dBSPL to upper limit: 129.0 dBSPL).

This instrument is in compliance with IEC 60651 (2001-10) 7.9 and 7.10, ANSI S1.4-1983 3.2 and IEC 60804 (2001-10) 9.2.1 for Type 1 sound level meters when used with a Larson Davis Type 1 microphone.

Technician: Sean Childs Test Date: 28AUG2017

Sound Level Meter Model: 820A Serial Number: A1584
Certificate of A-Weight Electrical Conformance

This Type 1 Sound Level Meter (including attached PRM828 preamplifier and ADP005 18 pF input adapter) was calibrated with a reference 1kHz sine wave at a level of 114.0 dBSPL. The instrument's A-weighted response was then electrically tested using a 1.8 Vrms sinewave at exact frequencies as specified in IEC 60651 (2001-10) and ANSI S1.4-1983.



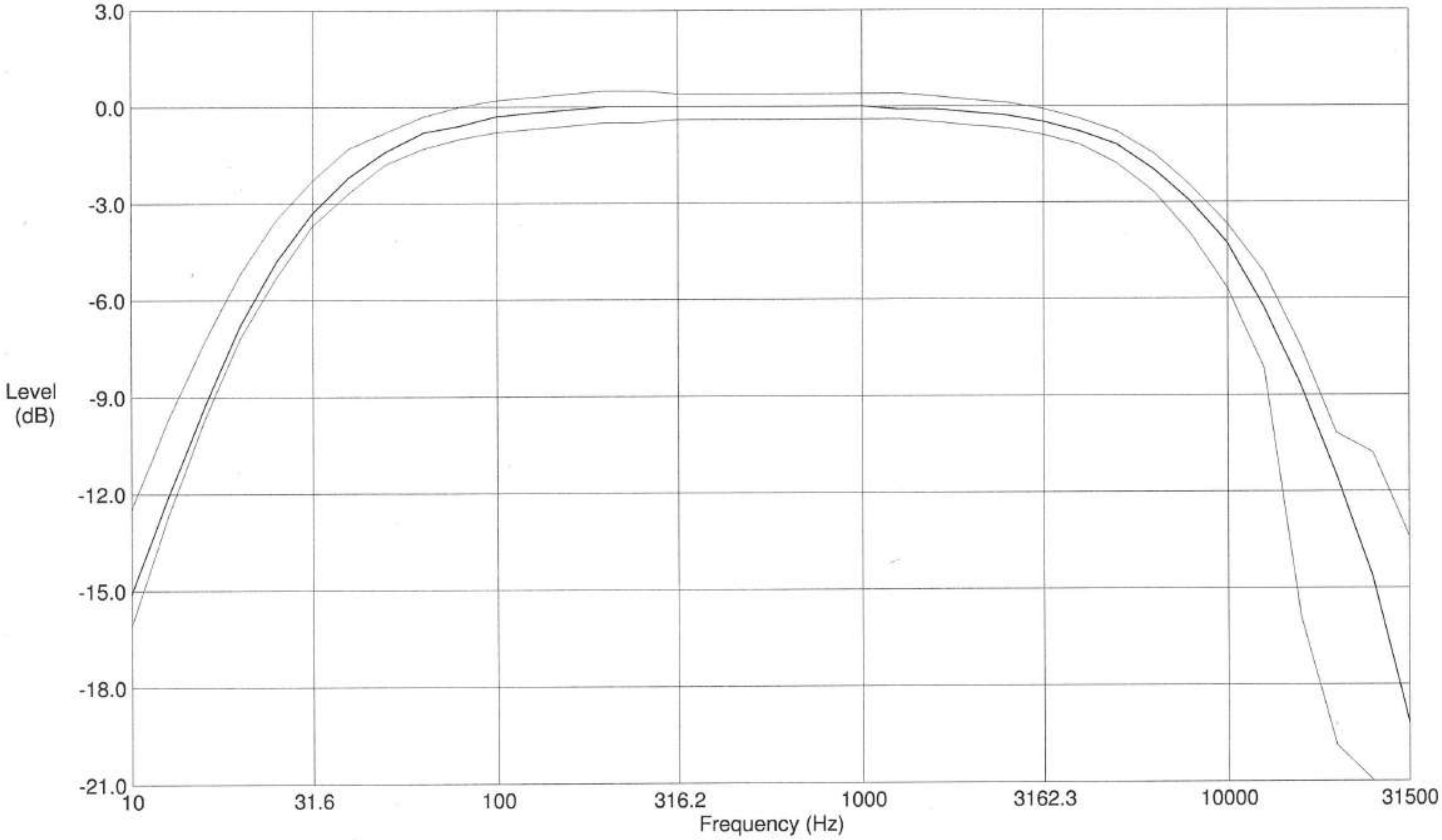
Freq (Hz)	Theor	Measured	Error	Tolerance	Freq (Hz)	Theor	Measured	Error	Tolerance
10.00	-70.4	-70.30	0.10	+1.8, -1.8	630.96	-1.9	-1.90	0.00	+0.4, -0.4
12.59	-63.4	-63.40	0.00	+1.5, -1.5	794.33	-0.8	-0.90	-0.10	+0.4, -0.4
15.85	-56.7	-56.50	0.20	+1.2, -1.2	1000.00	0.0	0.00	0.00	+0.4, -0.4
19.95	-50.5	-50.50	0.00	+1.0, -1.0	1258.90	0.6	0.50	-0.10	+0.4, -0.4
25.12	-44.7	-44.60	0.10	+0.9, -0.9	1584.90	1.0	0.80	-0.20	+0.4, -0.4
31.62	-39.4	-39.50	-0.10	+0.7, -0.7	1995.30	1.2	1.10	-0.10	+0.4, -0.4
39.81	-34.6	-34.80	-0.20	+0.7, -0.7	2511.90	1.3	1.10	-0.20	+0.4, -0.4
50.12	-30.2	-30.20	0.00	+0.5, -0.5	3162.30	1.2	1.00	-0.20	+0.4, -0.4
63.10	-26.2	-26.20	0.00	+0.5, -0.5	3981.10	1.0	0.80	-0.20	+0.4, -0.4
79.43	-22.5	-22.70	-0.20	+0.5, -0.5	5011.90	0.5	0.30	-0.20	+0.5, -0.5
100.00	-19.1	-19.30	-0.20	+0.5, -0.5	6309.60	-0.1	-0.30	-0.20	+0.5, -0.7
125.89	-16.1	-16.00	0.10	+0.5, -0.5	7943.30	-1.1	-1.30	-0.20	+0.5, -1.0
158.49	-13.4	-13.30	0.10	+0.5, -0.5	10000.00	-2.5	-2.70	-0.20	+0.7, -1.3
199.53	-10.9	-10.90	0.00	+0.5, -0.5	12589.00	-4.3	-4.50	-0.20	+1.0, -2.0
251.19	-8.6	-8.80	-0.20	+0.5, -0.5	15849.00	-6.6	-6.90	-0.30	+1.0, -7.4
316.23	-6.6	-6.80	-0.20	+0.4, -0.4	19953.00	-9.3	-9.80	-0.50	+1.0, -8.7
398.11	-4.8	-4.90	-0.10	+0.4, -0.4	25119.00	-12.4	-13.00	-0.60	+3.5, -9.6
501.19	-3.2	-3.30	-0.10	+0.4, -0.4	31623.00	-15.8	-17.50	-1.70	+4.3, -10.7

This instrument is in compliance with IEC 60651 (2001-10) 6.1 and 9.2.2, ANSI S1.4-1983 5.1 and 8.2.1, and IEC 60804 (2001-10) 5.1 for Type 1 sound level meters when used with a Larson Davis Type 1 microphone.

Technician: Sean Childs Test Date: 28AUG2017

Sound Level Meter Model: 820A Serial Number: A1584
Certificate of C-Weight Electrical Conformance

This Type 1 Sound Level Meter (including attached PRM828 preamplifier and ADP005 18 pF input adapter) was calibrated with a reference 1kHz sine wave at a level of 114.0 dBSPL. The instrument's C-weighted response was then electrically tested using a 1.8 Vrms sinewave at exact frequencies as specified in IEC 60651 (2001-10) and ANSI S1.4-1983.



Freq (Hz)	Theor	Measured	Error	Tolerance
10.00	-14.3	-15.10	-0.80	+1.8, -1.8
12.59	-11.2	-12.10	-0.90	+1.5, -1.5
15.85	-8.5	-9.30	-0.80	+1.2, -1.2
19.95	-6.2	-6.80	-0.60	+1.0, -1.0
25.12	-4.4	-4.80	-0.40	+0.9, -0.9
31.62	-3.0	-3.30	-0.30	+0.7, -0.7
39.81	-2.0	-2.20	-0.20	+0.7, -0.7
50.12	-1.3	-1.40	-0.10	+0.5, -0.5
63.10	-0.8	-0.80	0.00	+0.5, -0.5
79.43	-0.5	-0.60	-0.10	+0.5, -0.5
100.00	-0.3	-0.30	0.00	+0.5, -0.5
125.89	-0.2	-0.20	0.00	+0.5, -0.5
158.49	-0.1	-0.10	0.00	+0.5, -0.5
199.53	0.0	0.00	0.00	+0.5, -0.5
251.19	0.0	0.00	0.00	+0.5, -0.5
316.23	0.0	0.00	0.00	+0.4, -0.4
398.11	0.0	0.00	0.00	+0.4, -0.4
501.19	0.0	0.00	0.00	+0.4, -0.4

Freq (Hz)	Theor	Measured	Error	Tolerance
630.96	0.0	0.00	0.00	+0.4, -0.4
794.33	0.0	0.00	0.00	+0.4, -0.4
1000.00	0.0	0.00	0.00	+0.4, -0.4
1258.90	0.0	-0.10	-0.10	+0.4, -0.4
1584.90	-0.1	-0.10	0.00	+0.4, -0.4
1995.30	-0.2	-0.20	0.00	+0.4, -0.4
2511.90	-0.3	-0.30	0.00	+0.4, -0.4
3162.30	-0.5	-0.50	0.00	+0.4, -0.4
3981.10	-0.8	-0.80	0.00	+0.4, -0.4
5011.90	-1.3	-1.20	0.10	+0.5, -0.5
6309.60	-2.0	-2.00	0.00	+0.5, -0.7
7943.30	-3.0	-3.00	0.00	+0.5, -1.0
10000.00	-4.4	-4.30	0.10	+0.7, -1.3
12589.00	-6.2	-6.30	-0.10	+1.0, -2.0
15849.00	-8.5	-8.70	-0.20	+1.0, -7.4
19953.00	-11.2	-11.50	-0.30	+1.0, -8.7
25119.00	-14.3	-14.70	-0.40	+3.5, -9.6
31623.00	-17.7	-19.20	-1.50	+4.3, -10.7

This instrument is in compliance with IEC 60651 (2001-10) 6.1 and 9.2.2, ANSI S1.4-1983 5.1 and 8.2.1, and IEC 60804 (2001-10) 5.1 for Type 1 sound level meters when used with a Larson Davis Type 1 microphone.

Technician: Sean Childs Test Date: 28AUG2017

PCB PIEZOTRONICS
A PCB GROUP COMPANY

Certificate of Calibration and Conformance

Certificate Number 2017-205566

Instrument Model PRM828, Serial Number 2484, was calibrated on 28 Aug 2017. The instrument meets factory specifications per Procedure D0001.8135.

Instrument found to be in calibration as received: YES
Date Calibrated: 28 Aug 2017
Calibration due: 28 Aug 2018

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	19 Dec 2017	2016-204448
Agilent Technologies	34401A	MY41038589	12 Months	6 Jan 2018	2017000125

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 31 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

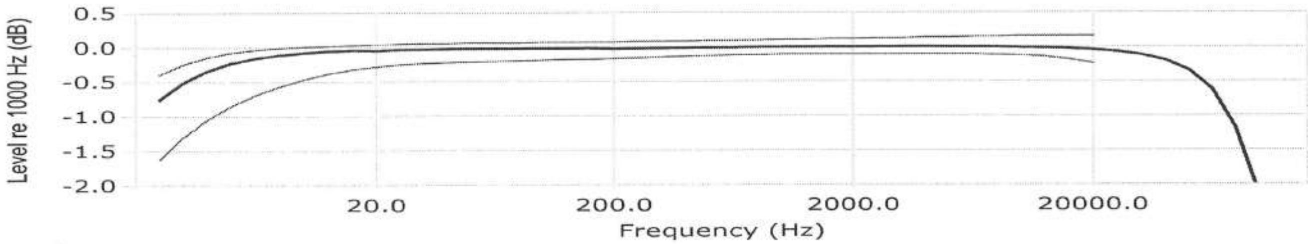
"As received" data is the same as shipped data.

Signed: Sean Childs
Technician: Sean Childs

Provo Engineering and Manufacturing Center, 1681 West 820 North, Provo, Utah 84601
Toll Free: 888.258.3222 Telephone: 716.926.8243 Fax: 716.926.8215
ISO 9001-2008 Certified

Preamplifier Model: PRM828 Serial Number: 2484
Frequency Response Test Report

Frequency response electrically tested at 120.0 dBµV using a 18 pF capacitor to simulate microphone capacitance.



Frequency (Hz)	Relative Level (dB)	Uncertainty (dB)	Limits (dB)	Frequency (Hz)	Relative Level (dB)	Uncertainty (dB)	Limits (dB)
2.5	-0.76	0.08	-0.39,-1.62	631.0	-0.00	0.02	0.10,-0.11
3.2	-0.51	0.06	-0.24,-1.30	794.3	-0.00	0.02	0.10,-0.11
4.0	-0.34	0.06	-0.14,-1.05	1000.0	0.00	0.02	0.11,-0.10
5.0	-0.23	0.04	-0.07,-0.85	1258.9	0.00	0.02	0.11,-0.10
6.3	-0.15	0.04	-0.03,-0.69	1584.9	0.00	0.02	0.12,-0.10
7.9	-0.10	0.04	0.00,-0.56	1995.3	0.00	0.02	0.12,-0.10
10.0	-0.07	0.02	0.01,-0.46	2511.9	0.00	0.02	0.13,-0.10
12.6	-0.05	0.02	0.02,-0.38	3162.3	0.01	0.02	0.13,-0.10
15.8	-0.04	0.02	0.03,-0.32	3981.1	0.01	0.02	0.14,-0.10
20.0	-0.04	0.02	0.04,-0.28	5011.9	0.00	0.02	0.14,-0.10
25.1	-0.03	0.02	0.05,-0.25	6309.6	0.00	0.02	0.15,-0.10
31.6	-0.03	0.02	0.06,-0.23	7943.3	-0.00	0.02	0.15,-0.11
39.8	-0.02	0.02	0.06,-0.22	10000.0	-0.01	0.02	0.16,-0.12
50.1	-0.02	0.02	0.07,-0.21	12589.3	-0.01	0.02	0.16,-0.14
63.1	-0.01	0.02	0.07,-0.20	15848.9	-0.02	0.02	0.16,-0.18
79.4	-0.01	0.02	0.07,-0.19	19952.6	-0.04	0.02	0.16,-0.24
100.0	-0.01	0.02	0.08,-0.18	25118.9	-0.07	0.02	inf ,-inf
125.9	-0.01	0.02	0.08,-0.17	31622.8	-0.11	0.02	inf ,-inf
158.5	-0.01	0.02	0.08,-0.17	39810.7	-0.19	0.02	inf ,-inf
199.5	-0.02	0.02	0.08,-0.16	50118.7	-0.34	0.02	inf ,-inf
251.2	-0.01	0.02	0.09,-0.15	63095.7	-0.61	0.05	inf ,-inf
316.2	-0.01	0.02	0.09,-0.14	79432.8	-1.18	0.05	inf ,-inf
398.1	-0.01	0.02	0.09,-0.13	100000.0	-2.15	0.05	inf ,-inf
501.2	-0.00	0.02	0.10,-0.12	125892.5	-3.44	0.06	inf ,-inf

1000 Hz measured level: 118.995 dBµV, -1.005 dB re input (0.033 dB uncertainty; -1.533 dB to -0.367 dB limit)
1 kHz (1/3 Octave) Noise Floor : 0.34 µV, -9.40 dBµV (0.47 dB uncertainty; -3.00 dB limit)
Flat (20 Hz - 20 kHz) Noise Floor : 6.28 µV, 15.96 dBµV (0.47 dB uncertainty; 17.00 dB limit)
A-weight Noise Floor : 1.82 µV, 5.21 dBµV (0.46 dB uncertainty; 13.00 dB limit)
Environmental conditions: 23.6 °C, 31.4 %RH (0.3 °C, 3 %RH uncertainty)
Uncertainties are given as expanded uncertainty at ~95 percent confidence level (k = 2).
Test Procedure: D0001.8135 with PRM828.xml
This frequency response is in compliance with manufacturers specification for the item tested.
This report may not be reproduced, except in full, without the written approval of the issuer.

Technician: Sean Childs Test Date: 28 Aug 2017 11:43:09

Test Location: Larson Davis, a division of PCB Piezotronics, Inc.
1681 West 820 North, Provo, Utah 84601
Tel: 716 684-0001 www.LarsonDavis.com

Calibration Certificate

Certificate Number 2017009356

Customer:
LSA Associates Inc
20 Executive Park
Irvine, CA 92614, United States

Model Number	377A60	***Procedure Number***	D0001.8387
Serial Number	101355	***Technician***	Abraham Ortega
Test Results	**Pass**	***Calibration Date***	29 Aug 2017
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	29 Aug 2018
		Temperature	23.5 °C ± 0.01 °C
Description	1/2 inch Microphone - RI - 200V	***Humidity***	31.6 %RH ± 0.5 %RH
		Static Pressure	101.27 kPa ± 0.03 kPa

Evaluation Method Tested electrically using an electrostatic actuator.

Compliance Standards Compliant to Manufacturer Specifications.

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.
Test points marked with a ‡ do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Larson Davis Model 2900 Real Time Analyzer	07/17/2017	07/17/2018	001230
Microphone Calibration System	08/30/2017	08/30/2018	001233
1/2" Preamplifier	12/15/2016	12/15/2017	001274
Agilent 34401A DMM	12/06/2016	12/06/2017	001329
Larson Davis CAL250 Acoustic Calibrator	01/04/2017	01/04/2018	003030
1/2" Preamplifier	04/12/2017	04/12/2018	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	09/12/2016	09/11/2017	006507
1/2 inch Microphone - RI - 200V	10/03/2016	10/03/2017	006511
1/2 inch Microphone - RI - 200V	08/09/2017	08/09/2018	006519
Larson Davis 1/2" Preamplifier 7-pin LEMO	09/12/2016	09/12/2017	006530
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/11/2017	08/11/2018	006531

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Certificate Number 2017009356

Sensitivity

Measurement	Test Result [mV/Pa]	Lower limit [mV/Pa]	Upper limit [mV/Pa]	Expanded Uncertainty [mV/Pa]	Result
Open Circuit Sensitivity	48.18	39.00	59.43	1.00	Pass

-- End of measurement results--

Capacitance

Measurement	Test Result [pF]	
Capacitance	19.00	‡

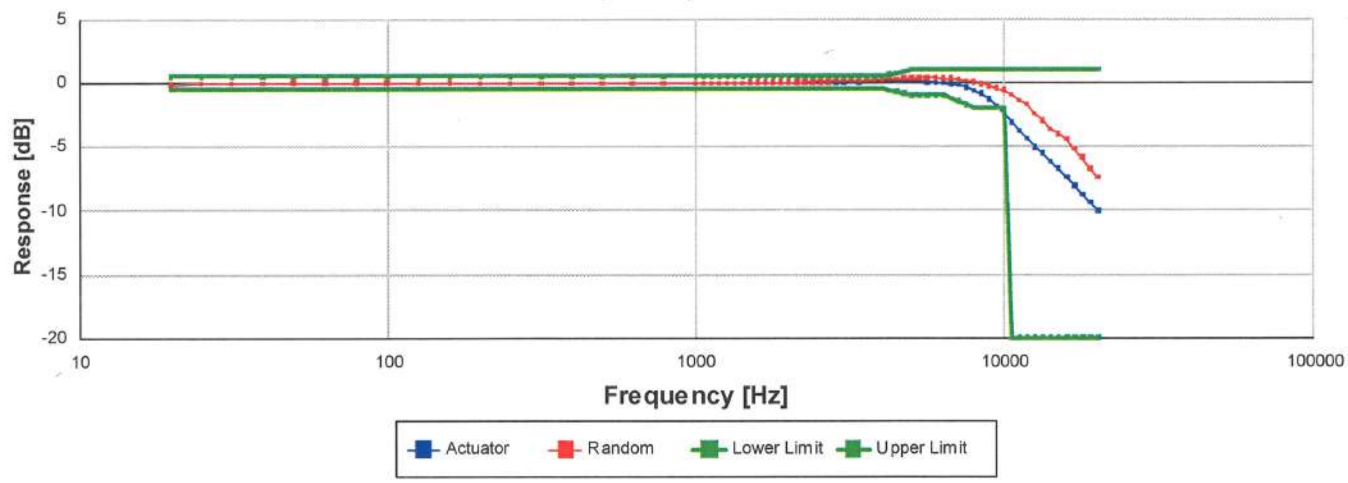
-- End of measurement results--

Lower Limiting Frequency

Measurement	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Result
-3 dB Frequency	1.19	1.00	2.00	Pass ‡

-- End of measurement results--

Frequency Response



Data is normalized for 0 dB @ 251.19 Hz.

Frequency [Hz]	Actuator [dB]	Random [dB]	Lower limit [dB]	Upper limit [dB]	Result
19.95	-0.11	-0.11	-0.50	0.50	Pass ‡
25.12	-0.05	-0.05	-0.50	0.50	Pass ‡
31.62	-0.02	-0.02	-0.50	0.50	Pass ‡
39.81	0.00	0.00	-0.50	0.50	Pass ‡
50.12	0.01	0.01	-0.50	0.50	Pass ‡
63.10	0.01	0.01	-0.50	0.50	Pass ‡
79.43	0.01	0.01	-0.50	0.50	Pass ‡
100.00	0.01	0.01	-0.50	0.50	Pass ‡
125.89	0.01	0.01	-0.50	0.50	Pass ‡
158.49	0.01	0.01	-0.50	0.50	Pass ‡
199.53	0.00	0.00	-0.50	0.50	Pass ‡

Frequency [Hz]	Actuator [dB]	Random [dB]	Lower limit [dB]	Upper limit [dB]	Result
251.19	0.00	0.00	-0.50	0.50	Pass ‡
316.23	0.00	0.00	-0.50	0.50	Pass ‡
398.11	-0.01	-0.01	-0.50	0.50	Pass ‡
501.19	-0.01	-0.01	-0.50	0.50	Pass ‡
630.96	-0.01	-0.01	-0.50	0.50	Pass ‡
794.33	-0.01	-0.01	-0.50	0.50	Pass ‡
1,000.00	-0.01	-0.01	-0.50	0.50	Pass ‡
1,059.25	-0.01	-0.01	-0.50	0.50	Pass ‡
1,122.02	0.00	0.00	-0.50	0.50	Pass ‡
1,188.50	0.00	0.00	-0.50	0.50	Pass ‡
1,258.93	0.00	0.00	-0.50	0.50	Pass ‡
1,333.52	0.00	0.00	-0.50	0.50	Pass ‡
1,412.54	0.00	0.00	-0.50	0.50	Pass ‡
1,496.24	0.01	0.01	-0.50	0.50	Pass ‡
1,584.89	0.01	0.01	-0.50	0.50	Pass ‡
1,678.80	0.01	0.01	-0.50	0.50	Pass ‡
1,778.28	0.02	0.02	-0.50	0.50	Pass ‡
1,883.65	0.02	0.02	-0.50	0.50	Pass ‡
1,995.26	0.02	0.02	-0.50	0.50	Pass ‡
2,113.49	0.03	0.03	-0.50	0.50	Pass ‡
2,238.72	0.04	0.04	-0.50	0.50	Pass ‡
2,371.37	0.05	0.06	-0.50	0.50	Pass ‡
2,511.89	0.06	0.07	-0.50	0.50	Pass ‡
2,660.73	0.06	0.07	-0.50	0.50	Pass ‡
2,818.38	0.07	0.09	-0.50	0.50	Pass ‡
2,985.38	0.08	0.11	-0.50	0.50	Pass ‡
3,162.28	0.10	0.14	-0.50	0.50	Pass ‡
3,349.65	0.08	0.14	-0.50	0.50	Pass ‡
3,548.13	0.09	0.17	-0.50	0.50	Pass ‡
3,758.37	0.10	0.20	-0.50	0.50	Pass ‡
3,981.07	0.11	0.23	-0.50	0.50	Pass ‡
4,216.97	0.12	0.26	-0.63	0.63	Pass ‡
4,466.84	0.12	0.29	-0.75	0.75	Pass ‡
4,731.51	0.12	0.32	-0.88	0.88	Pass ‡
5,011.87	0.11	0.34	-1.00	1.00	Pass ‡
5,308.84	0.10	0.35	-1.00	1.00	Pass ‡
5,623.41	0.07	0.36	-1.00	1.00	Pass ‡
5,956.62	0.04	0.37	-1.00	1.00	Pass ‡
6,309.57	-0.03	0.34	-1.00	1.00	Pass ‡
6,683.44	-0.11	0.31	-1.25	1.00	Pass ‡
7,079.46	-0.22	0.24	-1.50	1.00	Pass ‡
7,498.94	-0.39	0.15	-1.75	1.00	Pass ‡
7,943.28	-0.61	0.07	-2.00	1.00	Pass ‡
8,413.95	-0.89	-0.09	-2.00	1.00	Pass ‡
8,912.51	-1.29	-0.23	-2.00	1.00	Pass ‡
9,440.61	-1.83	-0.43	-2.00	1.00	Pass ‡
10,000.00	-2.39	-0.59	-2.00	1.00	Pass ‡
10,592.54	-3.09	-0.97		1.00	Pass ‡
11,220.19	-3.82	-1.37		1.00	Pass ‡
11,885.02	-4.39	-1.70		1.00	Pass ‡
12,589.25	-5.04	-2.42		1.00	Pass ‡
13,335.21	-5.54	-2.96		1.00	Pass ‡
14,125.38	-6.18	-3.64		1.00	Pass ‡

Frequency [Hz]	Actuator [dB]	Random [dB]	Lower limit [dB]	Upper limit [dB]	Result
14,962.36	-6.73	-4.01		1.00	Pass ‡
15,848.93	-7.39	-4.39		1.00	Pass ‡
16,788.04	-8.07	-5.12		1.00	Pass ‡
17,782.80	-8.74	-5.85		1.00	Pass ‡
18,836.49	-9.37	-6.69		1.00	Pass ‡
19,952.62	-10.00	-7.38		1.00	Pass ‡

-- End of measurement results--

Signatory: *Abraham Ortega*

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

CALIBRATION CERTIFICATE FOR LARSON DAVIS 824

PCB PIEZOTRONICS
A PCB GROUP COMPANY

Certificate of Calibration and Conformance

Certificate Number 2017-206012

Instrument Model 824, Serial Number A1612, was calibrated on 28 Nov 2017. The instrument meets factory specifications per Procedure D0001.8046, IEC 61672-1:2002 Class 1; IEC 60651-2001, 60804-2000 and ANSI S1.4-1983 Type 1 1/3, 1/1 Oct. Filters; S1.11-1986 Type 1C; IEC61260-am1-2001 Class 1 .

Instrument found to be in calibration as received: YES
Date Calibrated: 28 Nov 2017
Calibration due: 28 Nov 2018

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0662/0114	12 Months	8 Dec 2017	2016-204417

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 23 ° Centigrade

Relative Humidity: 26 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.
Tested with PRM902 S/N 2104

Signed: Sean Childs
Technician: Sean Childs

Provo Engineering and Manufacturing Center, 1681 West 820 North, Provo, Utah 84601
Toll Free: 888.258.3222 Telephone: 716.926.8243 Fax: 716.926.8215
ISO 9001-2008 Certified

PCB PIEZOTRONICS
A PCB GROUP COMPANY

Certificate of Calibration and Conformance

Certificate Number 2017-206010

Instrument Model PRM902, Serial Number 2104, was calibrated on 28 Nov 2017. The instrument meets factory specifications per Procedure D0001.8126.

Instrument found to be in calibration as received: YES
Date Calibrated: 28 Nov 2017
Calibration due: 28 Nov 2018

Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	19 Dec 2017	2016-204448
Agilent Technologies	34401A	MY41038589	12 Months	6 Jan 2018	2017000125

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

Calibration Environmental Conditions

Temperature: 23 ° Centigrade

Relative Humidity: 26 %

Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.

Signed: Sean Childs

Technician: Sean Childs

Provo Engineering and Manufacturing Center, 1681 West 820 North, Provo, Utah 84601
Toll Free: 888.258.3222 Telephone: 716.926.8243 Fax: 716.926.8215
ISO 9001-2008 Certified

Calibration Certificate

Certificate Number 2017012481

Customer:
LSA Associates Inc
20 Executive Park
Irvine, CA 92614, United States

Model Number	2541	***Procedure Number***	D0001.8387		
Serial Number	7977	***Technician***	Abraham Ortega		
Test Results	**Pass**	***Calibration Date***	29 Nov 2017		
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	29 Nov 2018		
		Temperature	23.5	°C	± 0.01 °C
Description	1/2 inch Microphone - FF - 200V	***Humidity***	27.9	%RH	± 0.5 %RH
		Static Pressure	101.49	kPa	± 0.03 kPa

Evaluation Method Tested electrically using an electrostatic actuator.

Compliance Standards Compliant to Manufacturer Specifications.

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.
Test points marked with a ‡ do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Larson Davis Model 2900 Real Time Analyzer	07/17/2017	07/17/2018	001230
Microphone Calibration System	08/30/2017	08/30/2018	001233
1/2" Preamplifier	12/15/2016	12/15/2017	001274
Agilent 34401A DMM	12/06/2016	12/06/2017	001329
Larson Davis CAL250 Acoustic Calibrator	01/04/2017	01/04/2018	003030
1/2" Preamplifier	04/12/2017	04/12/2018	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	09/12/2017	09/12/2018	006507
1/2 inch Microphone - RI - 200V	04/24/2017	04/24/2018	006510
1/2 inch Microphone - RI - 200V	08/09/2017	08/09/2018	006519
Larson Davis 1/2" Preamplifier 7-pin LEMO	09/12/2017	09/12/2018	006530
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/11/2017	08/11/2018	006531

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Calibration Certificate

Certificate Number 2017012136

Customer:
LSA Associates Inc
20 Executive Park
Irvine, CA 92614, United States

Model Number	CAL200	***Procedure Number***	D0001.8386			
Serial Number	3228	***Technician***	Scott Montgomery			
Test Results	**Pass**	***Calibration Date***	17 Nov 2017			
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	17 Nov 2018			
		Temperature	25	°C	± 0.3 °C	
Description	Larson Davis CAL200 Acoustic Calibrator	***Humidity***	33	%RH	± 3 %RH	
		Static Pressure	101.5	kPa	± 1 kPa	

Evaluation Method The data is aquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity. Data reported in dB re 20 μPa.

Compliance Standards Compliant to Manufacturer Specifications per D0001.8190 and the following standards:
IEC 60942:2003 ANSI S1.40-2006

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/06/2017	09/06/2018	001021
Larson Davis Model 2900 Real Time Analyzer	04/10/2017	04/10/2018	001051
Microphone Calibration System	08/08/2017	08/08/2018	005446
1/2" Preamplifier	10/05/2017	10/05/2018	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/08/2017	08/08/2018	006507
1/2 inch Microphone - RI - 200V	04/24/2017	04/24/2018	006510
Pressure Transducer	06/01/2017	06/01/2018	007310

CALIBRATION CERTIFICATE FOR LARSON DAVIS 831

Calibration Certificate

Certificate Number 2017004790
Customer:
LSA Associates Inc
20 Executive Park
Irvine, CA 92614, United States

Model Number	831	***Procedure Number***	D0001.8378		
Serial Number	0002441	***Technician***	Ron Harris		
Test Results	**Pass**	***Calibration Date***	9 May 2017		
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	9 May 2018		
		Temperature	23.54	°C	± 0.25 °C
Description	Larson Davis Model 831 Class 1 Sound Level Meter Firmware Revision: 2.311	***Humidity***	49.4	%RH	± 2.0 %RH
		Static Pressure	85.93	kPa	± 0.13 kPa

Evaluation Method Tested electrically using Larson Davis PRM831 S/N 017139 and a 12.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 μPa assuming a microphone sensitivity of 50.0 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8384:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Correction data from Larson Davis Model 831 Sound Level Meter Manual, I831.01 Rev O, 2016-09-19

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 μPa; Reference Range: 0 dB gain

Periodic tests were performed in accordance with precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2016-02-24 certificate number DE-15-M-PTB-0056.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
SRS DS360 Ultra Low Distortion Generator	2017-01-19	2018-01-19	006239
Hart Scientific 2626-S Humidity/Temperature Sensor	2016-06-17	2017-06-17	006946

Calibration Certificate

Certificate Number 2017004807

Customer:

LSA Associates Inc
20 Executive Park
Irvine, CA 92614, United States

Model Number	831	***Procedure Number***	D0001.8384		
Serial Number	0002441	***Technician***	Ron Harris		
Test Results	**Pass**	***Calibration Date***	9 May 2017		
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	9 May 2018		
		Temperature	23.89	°C	± 0.25 °C
Description	Larson Davis Model 831 Class 1 Sound Level Meter Firmware Revision: 2.311	***Humidity***	50.7	%RH	± 2.0 %RH
		Static Pressure	85.85	kPa	± 0.13 kPa

Evaluation Method ***Tested with:***

Larson Davis PRM831. S/N 017139
PCB 377B02. S/N 120629
Larson Davis CAL200. S/N 9079
Larson Davis CAL291. S/N 0203

Data reported in dB re 20 μPa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.

Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

Correction data from Larson Davis Model 831 Sound Level Meter Manual, I831.01 Rev O, 2016-09-19

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to

1/2" adaptor is used with the preamplifier.

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 μPa; Reference Range: 0 dB gain

Periodic tests were performed in accordance with precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2016-02-24 certificate number DE-15-M-PTB-0056.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
SRS DS360 Ultra Low Distortion Generator	2016-06-21	2017-06-21	006311
Hart Scientific 2626-S Humidity/Temperature Sensor	2016-06-17	2017-06-17	006946
Larson Davis CAL200 Acoustic Calibrator	2016-07-26	2017-07-26	007027
Larson Davis Model 831	2017-03-01	2018-03-01	007182
PCB 377A13 1/2 inch Prepolarized Pressure Microphone	2017-03-08	2018-03-08	007185
Larson Davis CAL291 Residual Intensity Calibrator	2016-09-22	2017-09-22	007287

Acoustic Calibration

Measured according to IEC 61672-3:2013 10 and ANSI S1.4-2014 Part 3: 10

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz	114.01	113.80	114.20	0.14	Pass

As Received Level: 114.13
Adjusted Level: 114.01

-- End of measurement results--

Acoustic Signal Tests, C-weighting

Measured according to IEC 61672-3:2013 12 and ANSI S1.4-2014 Part 3: 12 using a comparison coupler with Unit Under Test (UUT) and reference SLM using slow time-weighted sound level for compliance to IEC 61672-1:2013 5.5; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Expected [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
125	0.02	-0.20	-1.20	0.80	0.23	Pass
1000	0.08	0.00	-0.70	0.70	0.23	Pass
8000	-4.90	-3.00	-5.50	-1.50	0.32	Pass

-- End of measurement results--

Calibration Certificate

Certificate Number 2017004789

Customer:
LSA Associates Inc
20 Executive Park
Irvine, CA 92614, United States

Model Number	PRM831	***Procedure Number***	D0001.8383
Serial Number	017139	***Technician***	Ron Harris
Test Results	**Pass**	***Calibration Date***	9 May 2017
Initial Condition	AS RECEIVED same as shipped	***Calibration Due***	9 May 2018
		Temperature	23.4 °C ± 0.01 °C
Description	Larson Davis 1/2" Preamplifier for Model 831 Type 1	***Humidity***	50.5 %RH ± 0.5 %RH
		Static Pressure	85.94 kPa ± 0.03 kPa

Evaluation Method Tested electrically using a 12.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 μPa assuming a microphone sensitivity of 50.0 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Sound Level Meter / Real Time Analyzer	03/08/2017	03/08/2018	003003
Hart Scientific 2626-S Humidity/Temperature Sensor	06/17/2016	06/17/2017	006946
Agilent 34401A DMM	06/07/2016	06/07/2017	007165
SRS DS360 Ultra Low Distortion Generator	10/14/2016	10/14/2017	007167

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ilac-MRA ACCREDITED Cert. #3622.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

CALIBRATION CERTIFICATE FOR QUEST NOISE PRO

INSTRUCTION CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID R7360
Description Quest NoisePro DLX Dosimeter
Calibrated 5/2/2017

Manufacturer	Quest	**Classification**	
Model Number	NoisePro DLX Dosimeter	**Status**	pass
Serial Number	NXE120104	**Frequency**	Yearly EOM
Location	New Jersey	**Department**	Lab
Temp	77	**Humidity**	35

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Fail** **As Left Result: Pass**

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

Test Instrument ID	Description	Manufacturer	Serial Number	Last Cal Date	Next Cal Date
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	4/24/2017	4/24/2018
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	4/5/2017	4/5/2018
FLUKE 114	Fluke 114 NIST Traceable Multimeter	Fluke	15310288	5/6/2016	5/6/2017

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Cole

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

1340 Reynolds Avenue, Suite 108
Irvine, CA 92614
Toll-free: 888-620-7463

Pine Environmental Services, Inc.

Instrument ID R7360
Description Quest NoisePro DLX
Calibrated 4/16/2018 6:05:19PM

Manufacturer Quest
Model Number Noisepro DLX
Serial Number/ Lot Number NXE120104
Location California
Department

State Certified
Status Pass
Temp °C 24
Humidity % 48

Calibration Specifications

Group # 1
Group Name Calibrated to 114db w/ Quest Sound Source
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Next Cal Date / Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Angela Reiter

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 11571
Description Quest NoisePro DLX Dosimeter
Calibrated 5/23/2017

Manufacturer	Quest	**Classification**	
Model Number	NoisePro DLX Dosimeter	**Status**	pass
Serial Number	NXG070063	**Frequency**	Yearly EOM
Location	New Jersey	**Department**	Lab
Temp	76	**Humidity**	40

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Fail** **As Left Result: Pass**

Test Instruments Used During the Calibration

Test Instrument ID	Description	Manufacturer	Serial Number	Last Cal Date (As Of Cal Entry Date)	Next Cal Date
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	4/24/2017	4/24/2018
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	4/5/2017	4/5/2018

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Cole

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

1340 Reynolds Avenue, Suite 108
Irvine, CA 92614
Toll-free: 888-620-7463

Pine Environmental Services, Inc.

Instrument ID 11571
Description Quest NoisePro DLX
Calibrated 4/16/2018 6:04:25PM

Manufacturer	Quest	**State Certified**	
Model Number	Noisepro DLX	**Status**	Pass
Serial Number/ Lot Number	NXG070063	**Temp °C**	24
Location	California	**Humidity %**	48
Department			

Calibration Specifications

Group # 1
Group Name
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Next Cal Date / Last Cal Date/ Expiration Date Opened Date

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Angela Reiter

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

INSTRUMENT CALIBRATION REPORT

Advanced Labs, Inc.

Pine Environmental Services, Inc

Instrument ID 1432
Description Quest QC-10 Acoustic Calibrator
Calibrated 8/22/2017

Manufacturer	Quest	**Classification**	
Model Number	QC-10	**Status**	pass
Serial Number	QI0080143	**Frequency**	Yearly EOM
Location	New Jersey	**Department**	Lab
Temp	76	**Humidity**	36

Calibration Specifications

Group # 1
Group Name Acoustic Tests Performed
Test Performed: Yes **As Found Result: Fail** **As Left Result: Pass**

Test Instruments Used During the Calibration

(As Of Cal Entry Date)

Test Instrument ID	Description	Manufacturer	Serial Number	Last Cal Date	Next Cal Date
B&K 4226	Brüel & Kjær 4226	Brüel & Kjær	2590968	4/24/2017	4/24/2018
B&K 4228	Brüel & Kjær 4228	Brüel & Kjær	2667476	4/5/2017	4/5/2018
SOUNDPRO DL-1-1/3	3M SoundPro DL-1-1/3	Quest Technologies	BLL070002	4/17/2017	4/17/2018

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Kevin Cole

Advanced Labs, Inc. hereby certifies that this instrument is calibrated and functions to meet the manufacture's specifications using NIST traceable standards, or is derived from accepted values of physical constants.

APPENDIX A

Paleontological Analysis

MEMORANDUM

DATE: September 7, 2018

TO: Kenny Nguyen, P.E., Senior Civil Engineer, City of Santa Ana

FROM: Sarah Rieboldt, Ph.D., Senior Paleontological Resources Manager, LSA

SUBJECT: Paleontological Analysis of the Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project, Santa Ana, Orange County, California

INTRODUCTION

The City of Santa Ana (City), in conjunction with the California Department of Transportation (Caltrans) District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed Project) in Santa Ana, California. The purpose of the project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

Within the project limits, Fairview Street is bordered by single-family residences and a few commercial properties.

This memorandum was prepared to ensure that the proposed Project is in compliance with all applicable State and local regulations, requirements, and policies regarding paleontological resources, as well as guidelines of the Society of Vertebrate Paleontology (SVP, 2010). The applicable regulations, requirements, and policies include the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Division 13, Chapter 2.6; the *State CEQA Guidelines*, California Code of Regulations (CCR), Title 14, Chapter 3, Appendix G; PRC 5097.5; and the Conservation Element of the City of Santa Ana (City) General Plan (City of Santa Ana, 2010). This memorandum addresses the potential for the proposed Project to impact paleontological resources and, if needed, includes mitigation measures and other recommendations to minimize these impacts. The City is the Lead Agency under CEQA.

PROJECT LOCATION

The Project site extends along Fairview Street from approximately 9th Street to 16th Street. The Project site is depicted on the United States Geological Survey (USGS) *Anaheim, California*

7.5-minute topographic quadrangle map in unsectioned lands of the Los Angeles Land Grant (USGS, 1981; see Figure 1, provided in Attachment B).

PROJECT DESCRIPTION

The proposed Project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River. The proposed Project would widen Fairview Street from two lanes in each direction to three lanes in each direction. Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

The proposed bridge would be expanded from approximately 52 feet (ft) to 100 ft in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

The proposed Project would acquire partial right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APNs) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]).

An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. These utilities would need to be temporarily relocated during construction and then permanently relocated to the new bridge.

Water quality best management practices (BMPs) would be included to treat stormwater runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bikes would be detoured away from the Fairview Street bridge to the 17th Street Bridge to cross the Santa Ana River by way of the Santa Ana River Trail (SART) between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists who wish to cross the Santa Ana River would be detoured to adjacent City streets such as King Street.

Construction of the proposed Project would require temporary closure of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of the SART affected by project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street. There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detours are being coordinated with Orange County Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the river bed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the river bed.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the proposed Project Area. All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to pre-construction conditions or better prior to project completion.

Excavation associated with the various components of the proposed Project is expected to extend to a depth of 2 ft for the roadway widening, 4 ft for the utility relocations, 6 ft for the river pier footings, and 5 to 15 ft for the bridge abutments (personal communication, WKE, Inc., April, 2018).

METHODS

LSA examined geologic maps of the Project Area and reviewed relevant geological and paleontological literature to determine which geologic units are present in the Project Area and whether fossils have been recovered from those or similar geologic units elsewhere in the region. A search for known fossil localities was also conducted through the Natural History Museum of Los Angeles County (LACM) in order to determine the status and extent of previously recorded paleontological resources within and surrounding the Project Area.

RESULTS

Literature Review

The proposed Project is located at the northern end of the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast-trending structural block that extends from the Transverse Ranges in the north to the tip of Baja California in the south (California Geological Survey, 2002; Norris and Webb, 1976). This province is characterized by mountains and valleys that trend in a northwest-southeast direction, roughly parallel to the San Andreas Fault. The total width of the province is approximately 225 miles, extending from the Colorado Desert in the east, across the continental shelf, to the southern Channel Islands (i.e., Santa Barbara, San Nicolas, Santa Catalina, and San Clemente) (Sharp, 1976). It contains extensive pre-Cenozoic (more than 66 million years ago [Ma]) igneous and metamorphic rock covered by Cenozoic (less than 66 Ma) sedimentary deposits (Norris and Webb, 1976).

Within this larger region, the proposed Project is located in the Los Angeles Basin, a broad alluvial lowland bounded to the north and east by the San Gabriel and Santa Ana Mountains, respectively, and by the Pacific Ocean to the southwest (Yerkes et al., 1965). The Basin is underlain by a structural depression that has discontinuously accumulated thousands of feet of marine and terrestrial deposits since the Late Cretaceous (approximately 100.5 Ma) (Yerkes et al., 1965). Over millions of years, the Basin has experienced episodes of subsidence, deposition, uplift, erosion, and faulting, all of which have resulted in very complex geology and a very productive oil industry (Bilodeau et al., 2007; Yerkes et al., 1965). The surface of the basin slopes gently southwestward toward the ocean, interrupted in various places by low hills and traversed by several large rivers (Sharp, 1976; Yerkes et al., 1965), including the Los Angeles River, the Rio Hondo, the San Gabriel River, and the Santa Ana River.

Geologic mapping by Morton and Miller (2006) shows that the Project Area contains Very Young Wash Deposits and Young Alluvial Fan Deposits (see Figure 2, Geologic Map, provided in Attachment B). In addition, because the Project Area has been previously developed, some amount of Artificial Fill is likely present at the surface above the geologic unit mapped by Morton and Miller (2006). Ages for the geologic epochs and subdivisions are based on the International Chronostratigraphic Chart prepared by the International Commission on Stratigraphy (ICS, 2017) and Walker et al. (2012).

Artificial Fill

Artificial Fill consists of sediments that have been removed from one location and transported to another location by human activity, rather than by natural means. The transportation distance can vary from a few feet to many miles, and composition is dependent on the source and purpose. While Artificial Fill may contain fossils, these fossils have been removed from their original location and are thus out of stratigraphic context. Therefore, they are not considered important for scientific study. As such, Artificial Fill has no paleontological sensitivity.

Very Young Wash Deposits

The Very Young Wash Deposits are late Holocene in age (less than 4,200 years ago; Walker et al., 2012) and consist of unconsolidated sand and gravel in active washes, channels on active alluvial fans, and ephemeral streams (Morton and Miller, 2006). These deposits accumulated along river and stream channels as floods and debris flows carried sediment down from higher elevations. The size, color, and types of clasts in these deposits are dependent on the local bedrock from which they were derived, with boulder-size clasts more common closer to the mountains and in areas prone to flash floods (Morton and Miller, 2006). These deposits are mapped along the Santa Ana River channel in the Project Area.

Although Holocene deposits can contain remains of plants and animals, only those from the middle to early Holocene (4,200 to 11,700 years ago; Walker et al., 2012) are considered scientifically important (SVP, 2010). Older deposits that may contain scientifically important fossils may be encountered at undetermined depths below these late Holocene deposits. Therefore, the Very Young Wash Deposits are considered to have low paleontological sensitivity.

Young Alluvial Fan Deposits

Young Alluvial Fan Deposits, which are Holocene to late Pleistocene in age (less than 126,000 years ago; ICS, 2017), consist of unconsolidated gravel, sand, and silt with occasional cobbles and boulders near mountain fronts (Morton and Miller, 2006). These sediments were deposited by flooding streams and debris flows coming down from higher elevations and generally form a fan or lobe shape at the base of hills and mountains (Morton and Miller, 2006).

As noted above, only fossils from the middle to early Holocene (4,200 to 11,700 years ago; Walker et al., 2012) are considered scientifically important (SVP, 2010). These Holocene deposits overlie older Pleistocene deposits, which have produced scientifically important fossils elsewhere in the region (Jefferson, 1991a, 1991b; Miller, 1971; Reynolds and Reynolds, 1991; Springer et al., 2009). These older deposits span the end of the Rancholabrean North American Land Mammal Age (NALMA), which dates from 11,000 to 240,000 years ago (Sanders et al., 2009) and was named for the Rancho La Brea fossil site in central Los Angeles. The presence of *Bison* defines the beginning of the Rancholabrean NALMA (Bell et al., 2004), but fossils from this time also include other large and small mammals, reptiles, fish, invertebrates, and plants (Jefferson, 1991a, 1991b; Miller, 1971; Reynolds and Reynolds, 1991; Springer et al., 2009). There is a potential to find these types of fossils in the older sediments of this geologic unit, which may be encountered below a depth of approximately 10 ft. Therefore, these deposits are assigned low paleontological sensitivity from the surface to a depth of 10 ft and high sensitivity below that mark.

Fossil Locality Search

According to the locality search conducted by the LACM, there are no known fossil localities within the boundaries of the proposed Project. The LACM reports that the Project Area is underlain by deposits of younger Quaternary alluvium overlying older Quaternary alluvium (i.e., Young Alluvial Fan Deposits). The museum notes that these deposits typically do not contain scientifically significant fossils in the uppermost layers but, they may produce important fossils at depth.

The closest vertebrate locality in these older Quaternary deposits is LACM 1339, south-southwest of the Project Area near the top of the bluffs along Adams Avenue in Costa Mesa. This locality produced a specimen of horse (*Equus*) at a depth of 43 ft below the street. The next closest locality is LACM 2032, northeast of the Project Area near the intersection of Mission Road and Daly Street. That locality yielded specimens of mammoth (*Mammuthus*) and camel (Camelidae) at a depth of 15 ft below the top of the bluff. Locality LACM 4943, which is located northeast of the Project Area near the intersection of Glassell Street and Fletcher Avenue in Orange, produced a specimen of horse (*Equus*) at a depth of 8 to 10 ft below the surface.

The LACM believes that shallow excavations in the Young Alluvial Fan Deposits in the Project Area are unlikely to encounter any scientifically important vertebrate fossils. However, the museum notes that deeper excavations into these deposits may encounter scientifically significant vertebrate remains and should be monitored to recover those remains. A copy of the letter describing the locality search results from the LACM is provided in Attachment C.

CONCLUSIONS AND RECOMMENDATIONS

Any Artificial Fill present within the Project Area has no paleontological sensitivity, the Very Young Wash Deposits have low paleontological sensitivity, and the Young Alluvial Fan Deposits have low paleontological sensitivity from the surface to a depth of 10 ft and high paleontological sensitivity below a depth of 10 ft. The majority of project excavation is anticipated to be shallower than a depth of 10 ft, with only the bridge abutments possibly extending to a depth of 15 ft. However, because much of the Project Area has been previously developed, excavation into any existing native deposits for the abutments will have a limited impact area. Therefore, LSA recommends the following mitigation measure:

PALEO-1 If paleontological resources are encountered during the course of ground disturbance, work in the immediate area of the find shall be redirected and a paleontologist shall be contacted to assess the find for scientific significance. If determined to be significant, the fossil shall be collected from the field. The paleontologist may also make recommendations regarding additional mitigation measures, such as paleontological monitoring. Scientifically significant resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, cataloged, and curated into the permanent collections of a museum repository. If scientifically significant paleontological resources are collected, a report of findings shall be prepared to document the collection.

Implementation of this mitigation measure will ensure that project impacts to scientifically significant paleontological resources will be mitigated to a level that is less than significant.

Attachments: A – References
B – Figure 1: Project Location
Figure 2: Geologic Map
C – Paleontological Locality Search Results from the Natural History Museum of Los Angeles County

ATTACHMENT A

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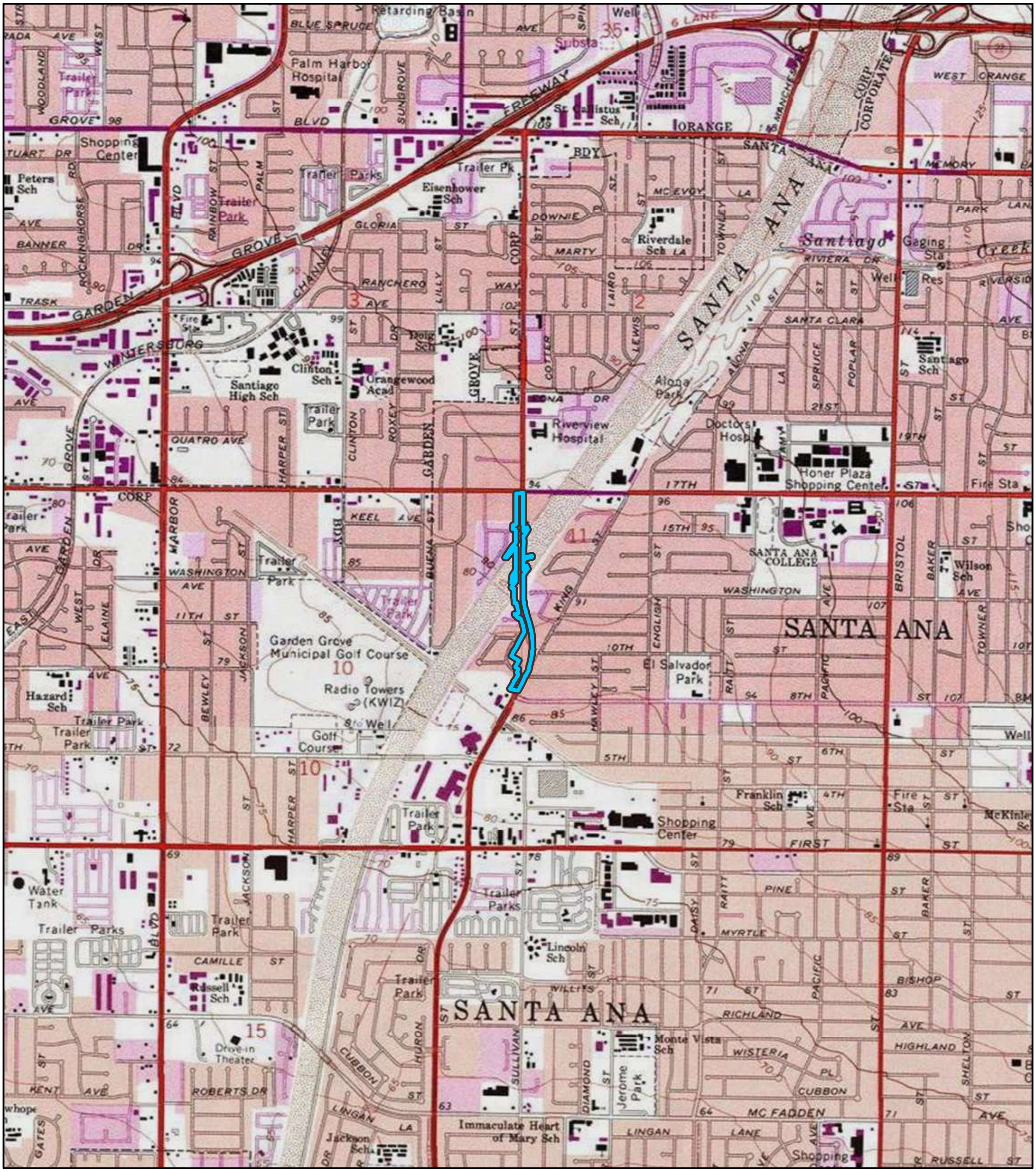
ATTACHMENT B

FIGURE 1: PROJECT LOCATION
FIGURE 2: GEOLOGIC MAP



MAP 2

LEGEND

Project Location

0 1000 2000
FEET

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Project Location

Federal Project No.: BRLS 5063(184)

SOURCE: USGS 7.5' Quad - Anaheim (1981) & Newport Beach (1981)

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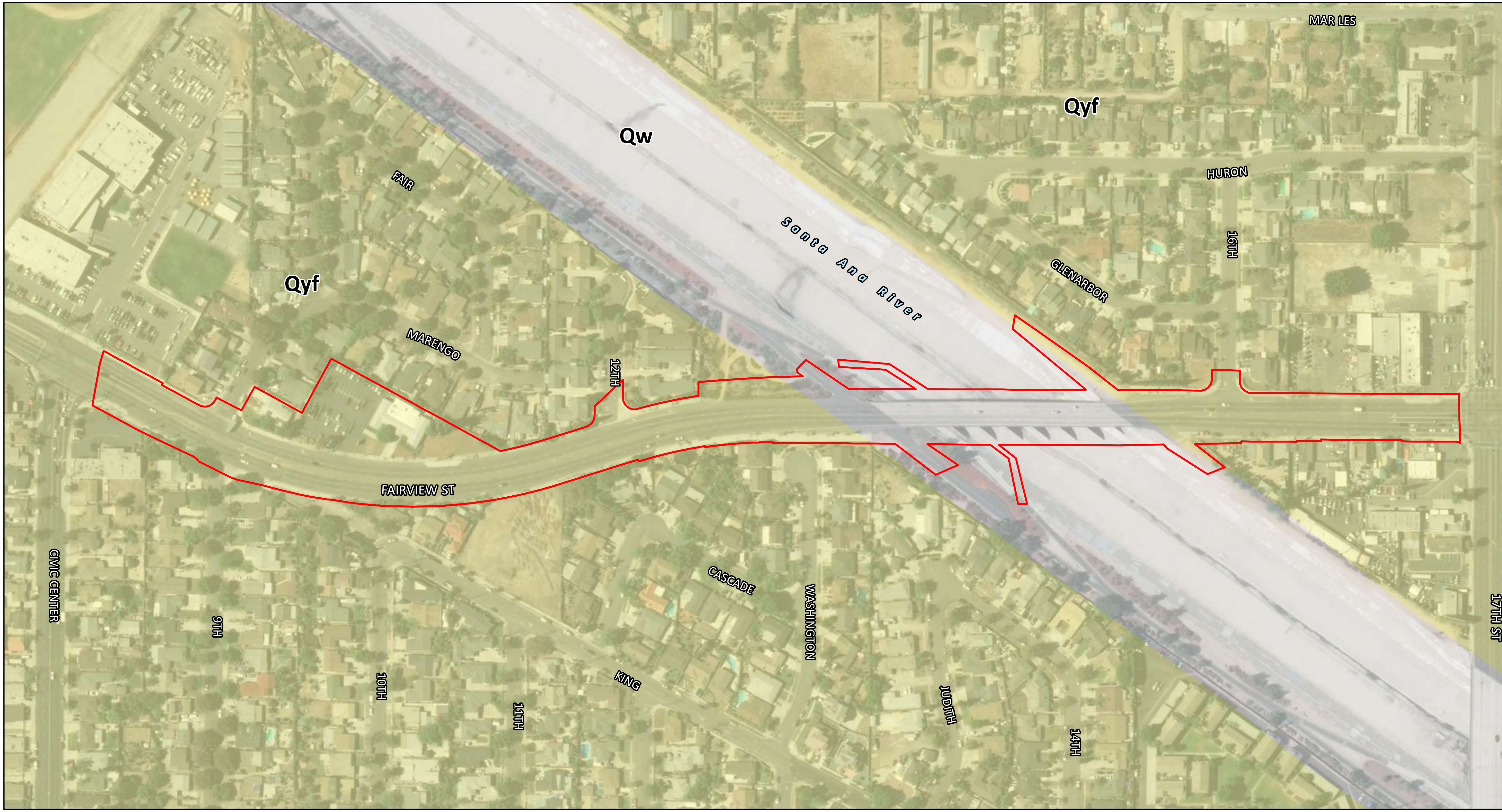


FIGURE 2

LEGEND

Project Boundary

Geologic Units

Qw - Very Young Wash Deposits

Qyf - Young Alluvial Fan Deposits

0 100 200
FEET

SOURCE: Bing (2015); WKE (2017); Morton and Miller (2006)

I:\WKE1702\GIS\Geology.mxd (5/9/2018)

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Geologic Map

Federal Project No.: BRLS 5063(184

ATTACHMENT C

PALEONTOLOGICAL LOCALITY SEARCH RESULTS FROM THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL
HISTORY
MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

23 February 2018

LSA Associates, Inc.
20 Executive Park, Suite 200
Irvine, California 92614

Attn: Sarah Rieboldt, Ph.D., Senior Paleontological Resources Manager

re: Paleontological Resources Records Check for the proposed Fairview Street Widening and Bridge Replacement Project, LSA Project # WKE1702, in the City of Santa Ana, Orange County, project area

Dear Sarah:

I have thoroughly searched our paleontology collection records for the locality and specimen data for the proposed Fairview Street Widening and Bridge Replacement Project, LSA Project # WKE1702, in the City of Santa Ana, Orange County, project area as outlined on the portion of the Anaheim USGS topographic quadrangle map that you sent to me via e-mail on 9 February 2018. We do not have any vertebrate fossil localities that lie within the proposed project area boundaries, but we do have localities nearby from the same sedimentary units that may occur subsurface in the proposed project area.

The entire proposed project has surface deposits of younger Quaternary Alluvium, derived as fluvial deposits from the Santa Ana River that flows through the northern portion of the proposed project area. These deposits are unlikely to contain significant vertebrate fossils in the uppermost layers, but older Quaternary deposits occurring at varying depths may well contain significant fossil vertebrate remains. Our closest vertebrate fossil locality from older Quaternary deposits is probably LACM 1339, south-southwest of the proposed project area in Costa Mesa east of the Santa Ana River near the top of the mesa bluffs along Adams Avenue, that produced fossil specimens of mammoth, *Mammuthus*, and camel, Camelidae, bones from sands approximately 15 feet below the top of the mesa that is overlain by shell bearing silts and sands.

Our next closest vertebrate fossil locality in older Quaternary sediments is probably LACM 4943, northeast of the proposed project area in the City of Orange between the Newport Freeway (Highway 55) and the Santa Ana River near the intersection of Glassell Street and Fletcher Avenue. Locality LACM 4943 produced a specimen of fossil horse, *Equus*, at a depth of 8-10 feet below the surface.

Surface grading or shallow excavations in the proposed project area probably will not uncover significant vertebrate fossil remains. Excavations that extend down into the older Quaternary deposits, however, may well encounter significant fossil vertebrate specimens. Any substantial excavations below the uppermost layers in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples from these deposits should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

APPENDIX A

Preliminary Geotechnical
Information

PRELIMINARY GEOTECHNICAL INFORMATION

Earth Mechanics, Inc.
March 20, 2018

General Geologic and Soils Information

The project site is located in the Los Angeles physiographic Basin which is a large, relatively flat, low-lying, coastal area surrounded by mountains on the north, east, and southeast. The western margin of the basin is bordered by the Pacific Ocean and the Palos Verdes Hills. The floor of the basin slopes gradually southwesterly from about 300 to 700 feet elevation along the margins of the surrounding hills to sea level along the coastline. The generally flat-lying nature of the Los Angeles Basin is disrupted by an alignment of northwest-southeast trending, low-elevation hills along the Newport-Inglewood Structural Zone. The areas on either side of the Newport-Inglewood Structural Zone are essentially flat and comprise the Downey-Tustin plain on the northeast and the Torrance Plain on the southwest. Major rivers within the basin are the Los Angeles, San Gabriel, and Santa Ana Rivers which enter the basin through gaps in the surrounding mountains and drain southerly across the basin floor.

The project site is located in the southeastern part of the Basin known as the Tustin Plain. Regional geologic studies indicate that Holocene-age, flood-plain sediments extend to a depth of a few hundred feet and overlie coarse sand and gravel of the Holocene-age Talbert aquifer. Quaternary-age sediments are about 2,000 feet thick in the region. The Quaternary sediments overlie Tertiary-age sedimentary rocks. The Mesozoic–age crystalline basement rocks are about 14,000 feet below the site.

The project site is relatively flat and situated at an elevation of about 100 feet. In the natural regime, the project site is within the Santa Ana River flood plain, and the portion of the river through the project area is confined to a concrete-lined channel.

Exploratory boreholes, drilled in years 2003 and 2004 at the project site, show that the area is underlain by non-indurated alluvial sediments ranging from clay to sand to gravel. The soils are Holocene-age flood-plain sediments of the Santa Ana River. Generally, the soils within the project consist of alternating, interbedded layers of sand with varying fines content, lean clay with varying amounts of sand, and few silt layers. The deeper sand layers include trace to moderate amounts of fine to coarse gravel.

Groundwater Information

Based on exploratory boreholes drilled in years 2003 and 2004, the groundwater elevation is shown to range between about +61 and +72 feet (about 25 to 30 feet below the Fairview Avenue grade).

Potential for Groundwater Dewatering

Foundation construction will likely involve driving concrete or steel piles, and therefore, with respect to driven pile construction, an extensive active dewatering program is not anticipated.

Lowering the groundwater table locally, for a temporary period, to an elevation just below the pile cap elevation may be required (to construct the pile caps). If CIDH piles are used for deep foundations, pile construction will require the wet method (slurry) of construction or installing temporary casing. Whether slurry or casing is used, groundwater will be expelled from each pile hole due to slurry or concrete displacing the groundwater. The expelled groundwater will need to be temporarily stored, tested for contaminants, and properly disposed.

APPENDIX A

Water Quality Memo

Fairview Avenue Widening
& Bridge Replacement

Santa Ana, CA 91203

River Hydraulics Analysis

Submitted to:

City of Santa Ana

20 Civic Center Plaza

Santa Ana, CA 92702

Prepared for:

WKE, Inc.

400 North Tustin Ave., Suite 275
Santa Ana, CA 92705

Submitted by:

Civil Works Engineers, Inc.

3151 Airway Avenue, Suite T-1
Costa Mesa, CA 92626

February 2019

TABLE OF CONTENTS

APPENDICES

- **Hydraulics Summary Table**
- **Water Surface Profiles**
- **Sections**
- **Improvement Plan**

INTRODUCTION

Fairview Street is classified as a north-south Major Arterial per the City's General Plan Circulation Element (GPCE) and the County of Orange's Master Plan of Arterial Highway (MPAH). The City is proposing to widen Fairview Street between 9th Street and 16th Street from a 4-lane street to a 6-lane arterial to provide adequate vehicular capacity within the City's northern limits.

The project includes the replacement of the bridge over the Santa Ana River. A new pier configuration is proposed within the Santa Ana River channel. The Santa Ana River is under the Army Corps of Engineers (USACE) jurisdiction and as-built plans (Reference 3) have been obtained and reviewed. The Santa Ana River baseline hydraulic model from the Corps of Engineers (Reference 4) has also been obtained and is used to model the proposed conditions and assess the impact of the new piers to the water surface profile.

Vicinity Map

HYDRAULIC MODEL

Existing Conditions

A baseline HEC-RAS (Reference 4) model was provided by the Corps of Engineers. This model was used to represent the existing conditions.

An existing analysis by HNTB Corporation in June 2017 prepared for the OC Streetcar, Santa Ana / Garden Grove Project (Reference 2). The report analyses a proposed bridge, downstream of the Fairview Street Bridge, just upstream of the existing OCTA Railroad Bridge. Review of the results of this analysis shows that the proposed Streetcar Bridge does not impact the hydraulics of the river near the Fairview Bridge.

Vertical Datum

The vertical datum used by the Corps of Engineers' baseline model is based on the National Geodetic Vertical Datum of 1929 (NGVD29). The mapping and survey information used for the Fairview project is based on the North American Vertical Datum of 1988 (NAVD88) which is approximately 2.4 feet higher. Therefore, 2.4 feet has to be added to the hydraulic model results to correlate with the project plans.

Proposed Hydraulic Model

The US Army Corps of Engineers, Hydrologic Engineering Center, River Analysis System, HEC-RAS 5.0.6. November 2018 (Reference 1) was used to model the proposed improvements to replace the existing bridge. Four new piers will replace the eight existing piers. The bridge will be wider and, therefore, the piers longer. The pier modeling includes debris loading of 2 feet on both sides of each pier, to a depth of 6 feet (see cross sections in appendix).

Modeling Parameters

- Flow Regime - Mixed flow was modeled as both subcritical and supercritical flows are anticipated within the study reach.
- Design Discharge - The design discharge of 46,000 cubic feet per second (cfs) is used at the proposed crossing as provided in USACE HEC-RAS model.
- Roughness values - Roughness values used in the Baseline Model; are 0.014 for the portion of the reach that is a concrete channel.
- Boundary Conditions – The Baseline Model uses critical depth at the upstream and downstream boundary conditions.
- Coefficients of Contraction/Expansion – no change in channel shape occurs within the reach of interest; therefore the current baseline model contraction and expansion coefficients of 0.1 and 0.3 are used.
- Bridge Modeling Method – Highest Energy solution between (1) Energy Only (Standard Step) and (2) Momentum.

Summary of Results

The hydraulic analyses were performed using the mixed flow computation scheme. The boundary conditions of the models and design flow rates were set the same as USACE HEC-RAS model (Baseline) with critical depth at the upstream and downstream boundary conditions and design flow of 46,000 cfs at the project site.

The hydraulic model under both existing and proposed condition shows a supercritical flow regime, in this reach of the river, downstream of Fairview Avenue Bridge. The regime becomes subcritical upstream of the bridge. A hydraulic jump occurs further upstream and flow transitions to supercritical regime. As shown on the profile provided in appendix, the new bridge improves the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of subcritical regime by approximately 300 feet.

In conclusion, the results show no impact to upstream and downstream structures and confirm that the proposed Fairview Avenue bridge provides some improvement to the local hydraulics.

REFERENCES

1. US Army Corps of Engineers, Hydrologic Engineering Center, River Analysis System, HEC-RAS 5.0.6. November 2018.
2. OC Streetcar, Santa Ana / Garden Grove Project, Santa Ana River Hydraulics Study Memo, submitted by HNTB Corporation, to Orange County Transportation Authority, June 2017.
3. U.S. Army Engineer District Los Angeles Corps of Engineers, Lower Santa Ana River Channel, District File No.239/798-890 As-built, March 1993.
4. HEC-RAS Baseline Model (BlowPrdoSIAM02)

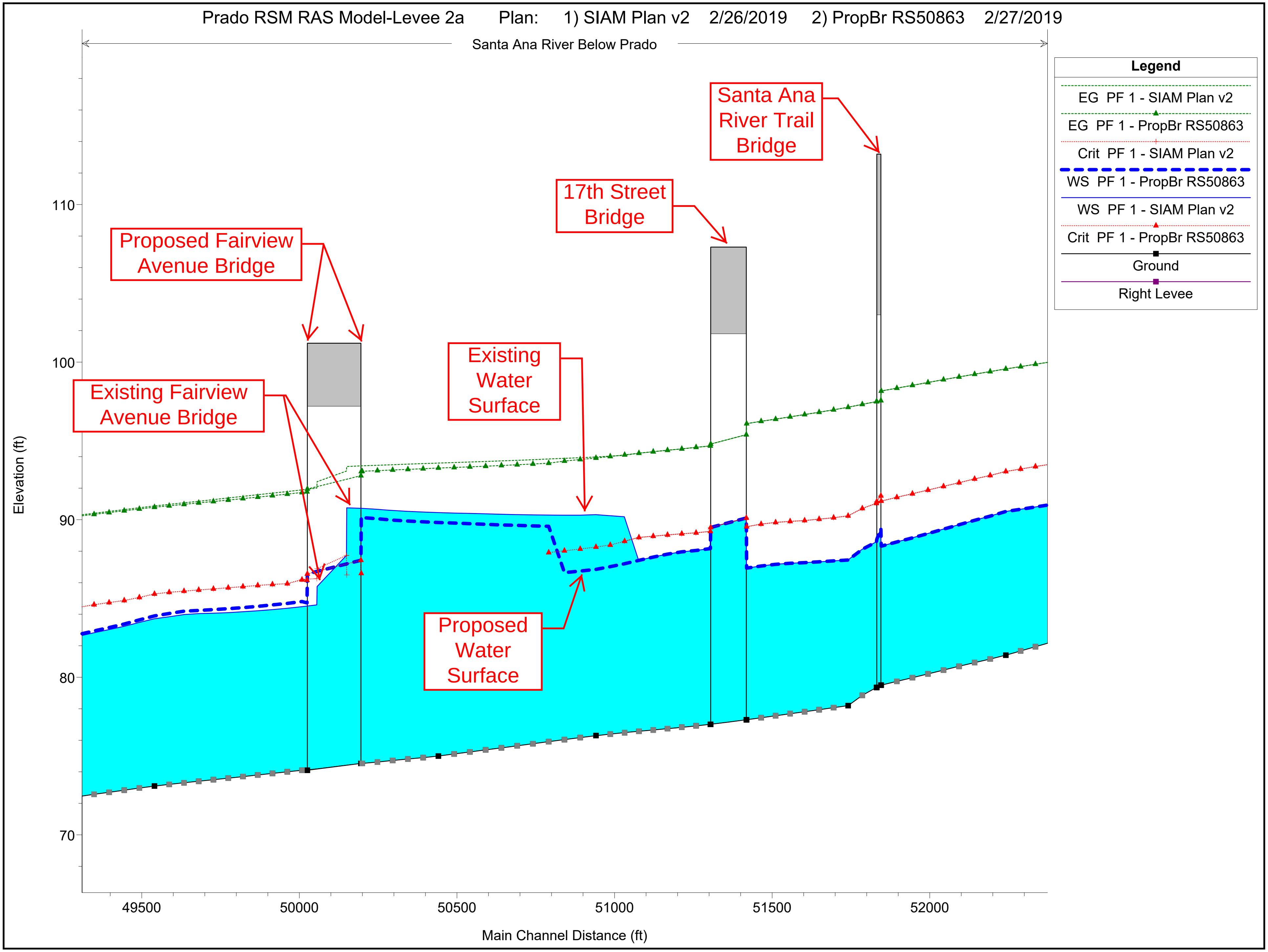
APPENDICES

- Hydraulics Summary Table
- Water Surface Profiles
- Sections
- Improvement Plan

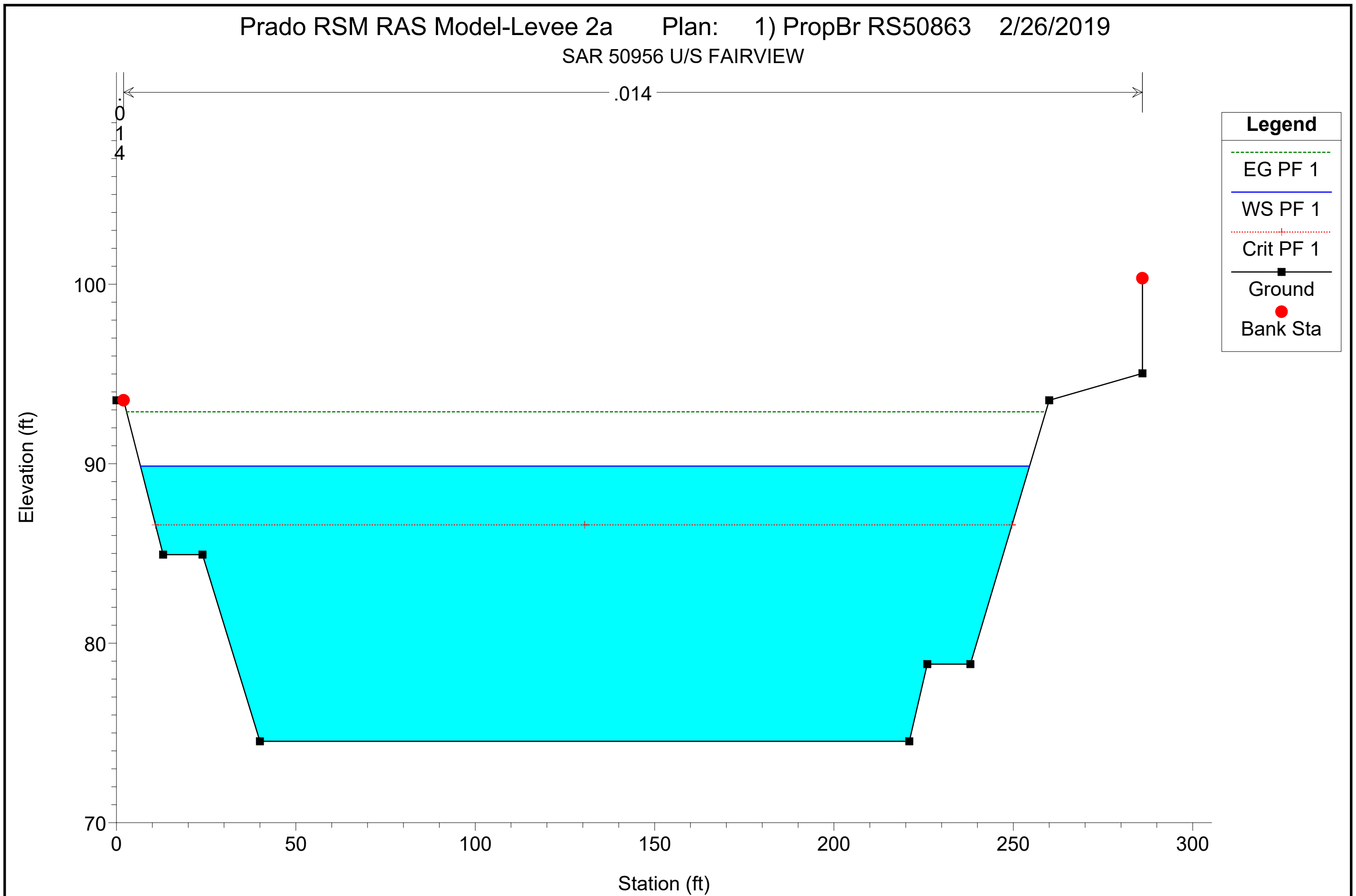
River Sta	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel (ft/s)	Froude #	W.S. Elev Difference
521+21		17th Street Bridge								
520+63	Existing	46000	77.01	88.17	89.26	94.68	0.00193	20.47	1.17	
520+63	Proposed	46000	77.01	88.17	89.26	94.68	0.001931	20.47	1.17	0.00
520+18	Existing	46000	76.92	88.05	89.17	94.59	0.001964	20.52	1.18	
520+18	Proposed	46000	76.92	88.05	89.17	94.59	0.001964	20.52	1.18	0.00
519+73	Existing	46000	76.83	87.96	89.11	94.49	0.001976	20.5	1.19	
519+73	Proposed	46000	76.83	87.96	89.11	94.49	0.001976	20.5	1.19	0.00
519+27	Existing	46000	76.74	87.81	89.03	94.4	0.00188	20.59	1.17	
519+27	Proposed	46000	76.74	87.81	89.03	94.4	0.00188	20.59	1.17	0.00
518+82	Existing	46000	76.65	87.62	88.95	94.31	0.001893	20.74	1.17	
518+82	Proposed	46000	76.65	87.62	88.95	94.31	0.001893	20.74	1.17	0.00
518+36	Existing	46000	76.57	87.42	88.87	94.22	0.001917	20.91	1.18	
518+36	Proposed	46000	76.57	87.42	88.87	94.22	0.001917	20.91	1.18	0.00
517+91	Existing	46000	76.48	90.18	88.63	94.09	0.000927	15.85	0.84	
517+91	Proposed	46000	76.48	87.21	88.63	94.12	0.001983	21.08	1.2	-2.97
517+46	Existing	46000	76.39	90.25		94.03	0.000883	15.6	0.82	
517+46	Proposed	46000	76.39	87.02	88.39	94.02	0.002038	21.22	1.21	-3.23
517+00	Existing	46000	76.3	90.32		93.98	0.000842	15.36	0.8	
517+00	Proposed	46000	76.3	86.84	88.27	93.91	0.002084	21.33	1.23	-3.48
516+50	Existing	46000	76.17	90.29		93.93	0.000818	15.32	0.79	
516+50	Proposed	46000	76.17	86.74	88.14	93.82	0.002073	21.34	1.22	-3.55
516+00	Existing	46000	76.04	90.29		93.89	0.000782	15.23	0.78	
516+00	Proposed	46000	76.04	86.64	88.03	93.72	0.002063	21.35	1.22	-3.65
515+50	Existing	46000	75.91	90.3		93.85	0.000749	15.12	0.76	
515+50	Proposed	46000	75.91	89.58	87.91	93.59	0.000883	16.06	0.83	-0.72
515+00	Existing	46000	75.78	90.31		93.81	0.00072	15.01	0.75	
515+00	Proposed	46000	75.78	89.61		93.53	0.000848	15.9	0.81	-0.70
514+50	Existing	46000	75.65	90.32		93.77	0.000694	14.89	0.74	
514+50	Proposed	46000	75.65	89.64		93.49	0.000816	15.74	0.8	-0.68
514+00	Existing	46000	75.52	90.35		93.73	0.000669	14.76	0.73	
514+00	Proposed	46000	75.52	89.67		93.44	0.000784	15.58	0.78	-0.68
513+50	Existing	46000	75.39	90.37		93.7	0.000645	14.62	0.71	
513+50	Proposed	46000	75.39	89.71		93.4	0.000753	15.4	0.77	-0.66
513+00	Existing	46000	75.26	90.4		93.66	0.000622	14.49	0.7	
513+00	Proposed	46000	75.26	89.75		93.36	0.000723	15.24	0.75	-0.65
512+50	Existing	46000	75.13	90.42		93.63	0.000601	14.36	0.69	
512+50	Proposed	46000	75.13	89.78		93.32	0.000696	15.08	0.74	-0.64
512+00	Existing	46000	75	90.45		93.59	0.000581	14.23	0.68	
512+00	Proposed	46000	75	89.82		93.28	0.00067	14.92	0.73	-0.63
511+52	Existing	46000	74.9	90.49		93.56	0.000564	14.05	0.67	
511+52	Proposed	46000	74.9	89.87		93.24	0.000647	14.72	0.72	-0.62

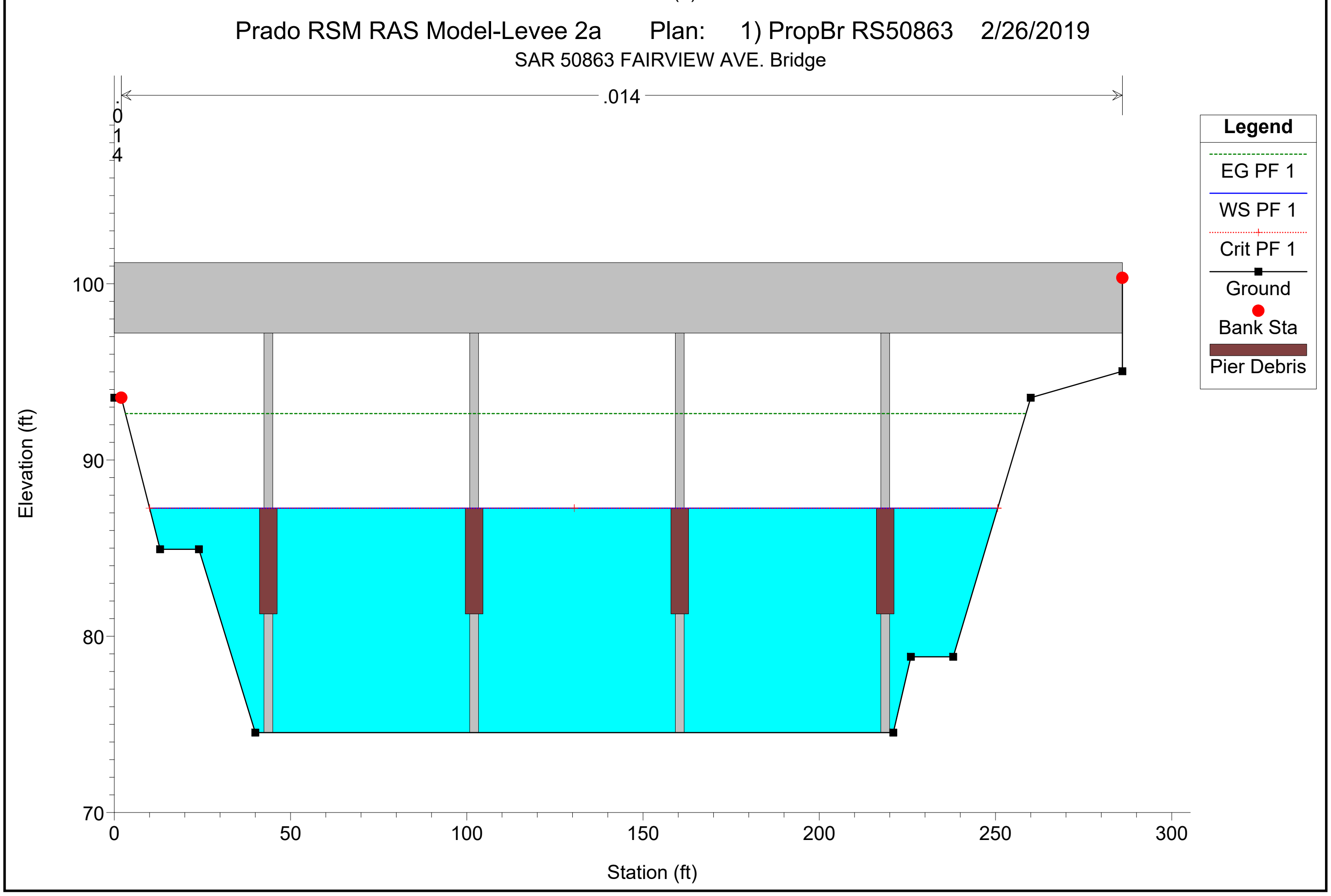
River Sta	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel (ft/s)	Froude #	W.S. Elev Difference
511+04	Existing	46000	74.81	90.53		93.52	0.000549	13.89	0.66	
511+04	Proposed	46000	74.81	89.91		93.2	0.000628	14.54	0.71	-0.62
510+55	Existing	46000	74.72	90.59		93.49	0.000545	13.66	0.66	
510+55	Proposed	46000	74.72	89.97		93.16	0.000621	14.32	0.7	-0.62
510+07	Existing	46000	74.62	90.66		93.45	0.00051	13.4	0.64	
510+07	Proposed	46000	74.62	90.06		93.11	0.000584	14.01	0.68	-0.60
509+59	Existing	46000	74.53	90.72		93.42	0.000484	13.17	0.62	
509+59	Proposed	46000	74.53	90.14		93.07	0.000552	13.75	0.66	-0.58
509+56	Proposed	46000	74.53	90.17	86.59	93.06	0.000538	13.64	0.65	
509+10	Existing	46000	74.43	90.75	86.49	93.37	0.000462	12.98	0.61	-0.58
508+63	Fairview Avenue Bridge									
508+15	Existing	46000	74.2	84.59	86.26	92	0.002204	21.84	1.25	0.13
507+84	Proposed	46000	74.1	84.72	86.16	91.77	0.002168	21.3	1.24	
507+68	Existing	46000	74.1	84.48	86.22	91.89	0.002224	21.84	1.26	
507+68	Proposed	46000	74.1	84.81	86.18	91.73	0.001998	21.1	1.2	0.33
507+22	Existing	46000	74	84.38	85.94	91.79	0.00224	21.83	1.26	
507+22	Proposed	46000	74	84.69	85.94	91.63	0.002024	21.13	1.21	0.31
506+75	Existing	46000	73.9	84.29	85.9	91.69	0.002249	21.81	1.26	
506+75	Proposed	46000	73.9	84.59	85.9	91.53	0.002036	21.12	1.21	0.30
506+28	Existing	46000	73.8	84.22	85.82	91.58	0.00225	21.76	1.27	
506+28	Proposed	46000	73.8	84.5	85.82	91.43	0.002051	21.13	1.21	0.28
505+81	Existing	46000	73.7	84.16	85.75	91.48	0.002246	21.71	1.26	
505+81	Proposed	46000	73.7	84.42	85.75	91.34	0.002056	21.1	1.21	0.26
505+34	Existing	46000	73.6	84.1	85.68	91.38	0.002237	21.65	1.26	
505+34	Proposed	46000	73.6	84.35	85.68	91.25	0.002055	21.06	1.21	0.25
504+88	Existing	46000	73.5	84.07	85.61	91.27	0.00221	21.54	1.25	
504+88	Proposed	46000	73.5	84.29	85.61	91.16	0.002048	21.01	1.21	0.22
504+41	Existing	46000	73.4	84.04	85.54	91.17	0.002177	21.42	1.25	
504+41	Proposed	46000	73.4	84.24	85.54	91.06	0.002035	20.95	1.21	0.20
503+94	Existing	46000	73.3	83.98	85.47	91.07	0.002032	21.37	1.21	
503+94	Proposed	46000	73.3	84.19	85.47	90.97	0.002016	20.89	1.2	0.21
503+47	Existing	46000	73.2	83.84	85.39	90.97	0.002053	21.42	1.22	
503+47	Proposed	46000	73.2	84.05	85.39	90.88	0.001923	20.97	1.18	0.21
503+00	Existing	46000	73.1	83.71	85.29	90.87	0.002071	21.47	1.22	
503+00	Proposed	46000	73.1	83.89	85.29	90.79	0.001955	21.07	1.19	0.18
502+52	Existing	46000	72.97	83.48	85.07	90.76	0.002136	21.65	1.24	
502+52	Proposed	46000	72.97	83.64	85.07	90.68	0.002029	21.29	1.21	0.16
502+04	Existing	46000	72.83	83.24	84.87	90.64	0.002202	21.83	1.26	
502+04	Proposed	46000	72.83	83.38	84.87	90.57	0.002102	21.51	1.23	0.14
501+57	Existing	46000	72.7	83.03	84.74	90.53	0.002255	21.97	1.27	

River Sta	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel (ft/s)	Froude #	W.S. Elev Difference
501+57	Proposed	46000	72.7	83.15	84.74	90.45	0.002161	21.67	1.25	0.12
501+09	Existing	46000	72.57	82.82	84.61	90.41	0.002303	22.09	1.28	
501+09	Proposed	46000	72.57	82.94	84.61	90.34	0.002215	21.81	1.26	0.12
500+61	Existing	46000	72.43	82.61	84.44	90.29	0.002354	22.23	1.3	
500+61	Proposed	46000	72.43	82.72	84.44	90.22	0.002272	21.97	1.28	0.11
500+13	Existing	46000	72.3	82.43	84.3	90.16	0.002387	22.3	1.3	
500+13	Proposed	46000	72.3	82.53	84.3	90.09	0.002307	22.05	1.28	0.10
499+65	Existing	46000	72.17	82.26	84.16	90.03	0.002419	22.37	1.31	
499+65	Proposed	46000	72.17	82.35	84.16	89.97	0.002342	22.14	1.29	0.09
499+17	Existing	46000	72.03	82.07	84.01	89.9	0.002454	22.45	1.32	
499+17	Proposed	46000	72.03	82.15	84.01	89.85	0.002389	22.26	1.3	0.08
498+69	Existing	46000	71.9	81.9	83.86	89.78	0.002482	22.51	1.33	
498+69	Proposed	46000	71.9	81.98	83.86	89.72	0.002419	22.32	1.31	0.08
498+21	Existing	46000	71.77	81.73	83.72	89.65	0.002508	22.57	1.33	
498+21	Proposed	46000	71.77	81.81	83.72	89.59	0.002448	22.38	1.32	0.08
497+73	Existing	46000	71.63	81.55	83.58	89.51	0.00254	22.63	1.34	
497+73	Proposed	46000	71.63	81.62	83.58	89.46	0.002481	22.46	1.33	0.07
497+25	Existing	46000	71.5	81.39	83.44	89.38	0.002563	22.68	1.35	
497+25	Proposed	46000	71.5	81.46	83.44	89.33	0.002506	22.51	1.33	0.07
496+77	Existing	46000	71.37	81.29	83.31	89.26	0.002544	22.65	1.34	
496+77	Proposed	46000	71.37	81.35	83.31	89.21	0.002489	22.49	1.33	0.06
496+30	Existing	46000	71.23	81.17	83.17	89.14	0.002535	22.66	1.34	
496+30	Proposed	46000	71.23	81.23	83.17	89.09	0.002478	22.49	1.33	0.06
495+82	Existing	46000	71.1	81.06	83.04	89.03	0.002518	22.64	1.34	
495+82	Proposed	46000	71.1	81.13	83.04	88.98	0.002464	22.48	1.32	0.07
495+34	Existing	46000	70.97	80.96	82.92	88.91	0.002502	22.62	1.33	
495+34	Proposed	46000	70.97	81.02	82.92	88.86	0.00245	22.46	1.32	0.06
494+86	Existing	46000	70.83	80.84	82.79	88.78	0.002491	22.61	1.33	
494+86	Proposed	46000	70.83	80.9	82.79	88.73	0.002437	22.45	1.32	0.06
494+38	Existing	46000	70.7	80.73	82.67	88.66	0.002478	22.6	1.33	
494+38	Proposed	46000	70.7	80.78	82.67	88.62	0.002432	22.46	1.32	0.05
493+90	Existing	46000	70.57	80.61	82.55	88.55	0.002474	22.61	1.33	
493+90	Proposed	46000	70.57	80.67	82.55	88.51	0.002426	22.47	1.31	0.06
493+42	Existing	46000	70.43	80.49	82.42	88.43	0.002461	22.59	1.32	
493+42	Proposed	46000	70.43	80.53	82.42	88.4	0.00243	22.5	1.32	0.04
492+94	Existing	46000	70.3	80.37	82.3	88.31	0.002456	22.6	1.32	
492+94	Proposed	46000	70.3	80.41	82.3	88.28	0.002424	22.51	1.31	0.04
492+46	Existing	46000	70.17	80.26	82.18	88.2	0.00245	22.61	1.32	
492+46	Proposed	46000	70.17	80.3	82.18	88.17	0.002417	22.51	1.31	0.04
491+98	Existing	46000	70.03	80.12	82.05	88.09	0.002455	22.65	1.32	
491+98	Proposed	46000	70.03	80.15	82.05	88.06	0.002424	22.55	1.31	0.03



1 in Horiz. = 400 ft 1 in Vert. = 8 ft

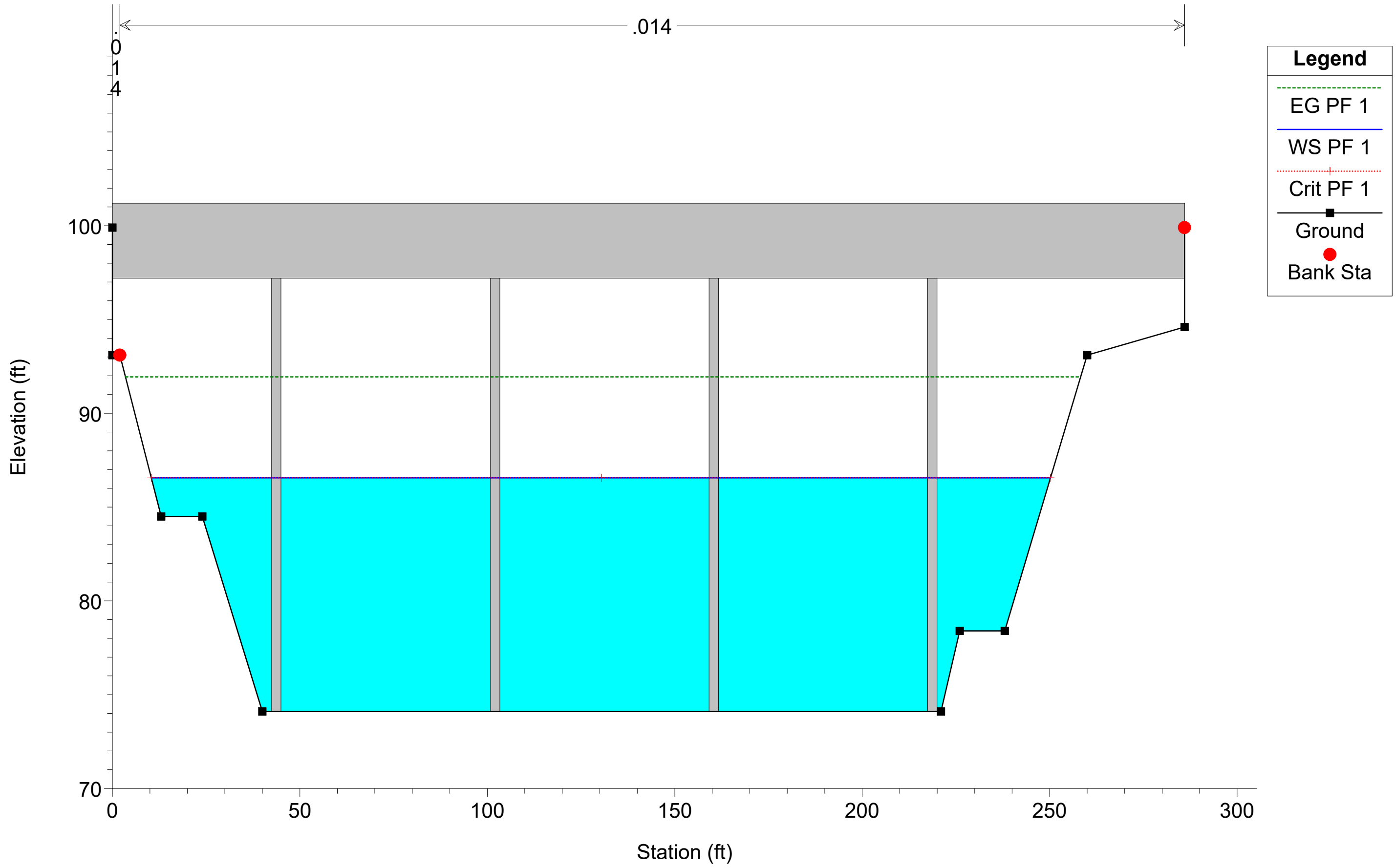




1 in Horiz. = 50 ft 1 in Vert. = 10 ft

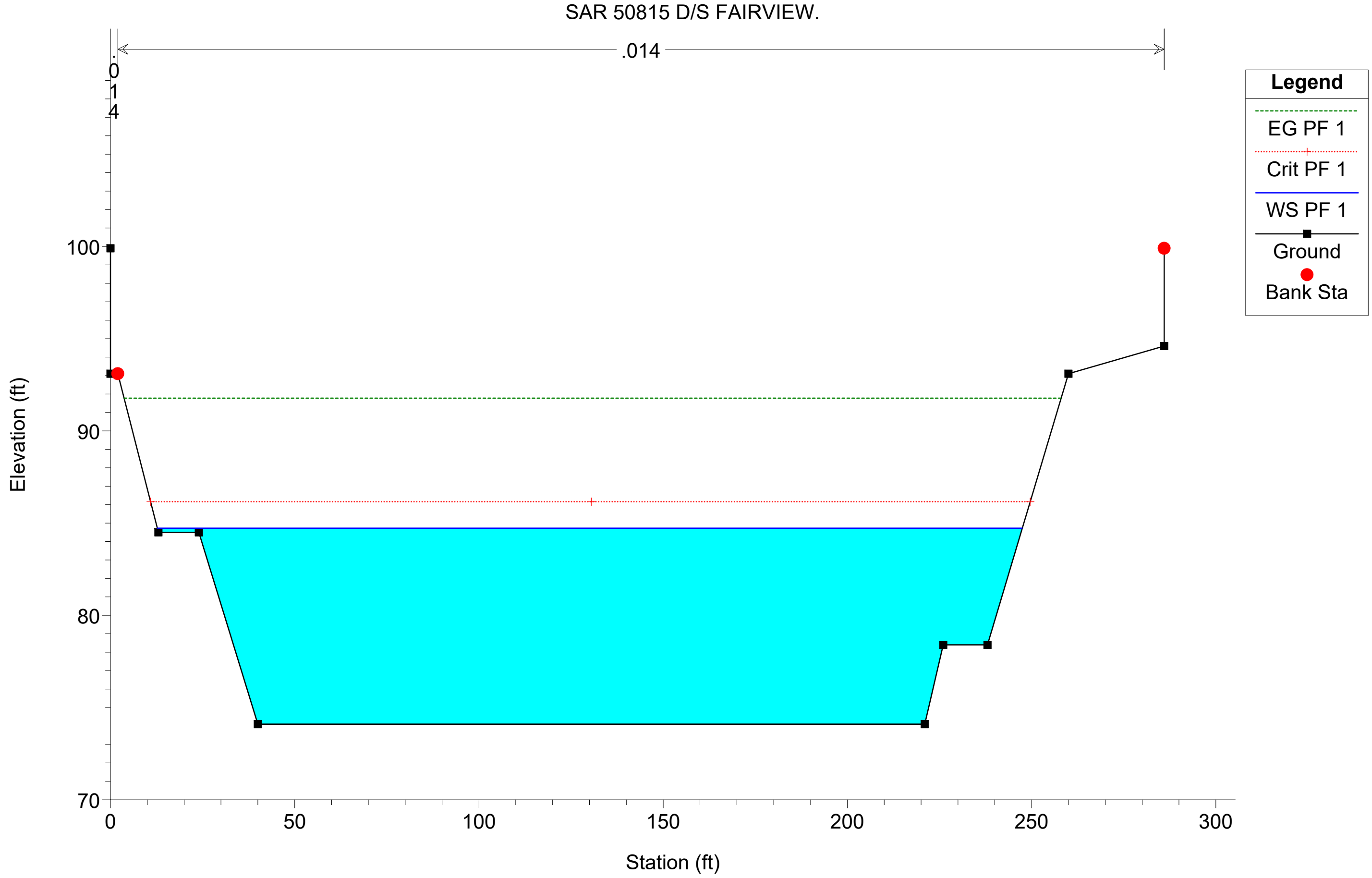
Prado RSM RAS Model-Levee 2a Plan: 1) PropBr RS50863 2/26/2019

SAR 50863 FAIRVIEW AVE. Bridge



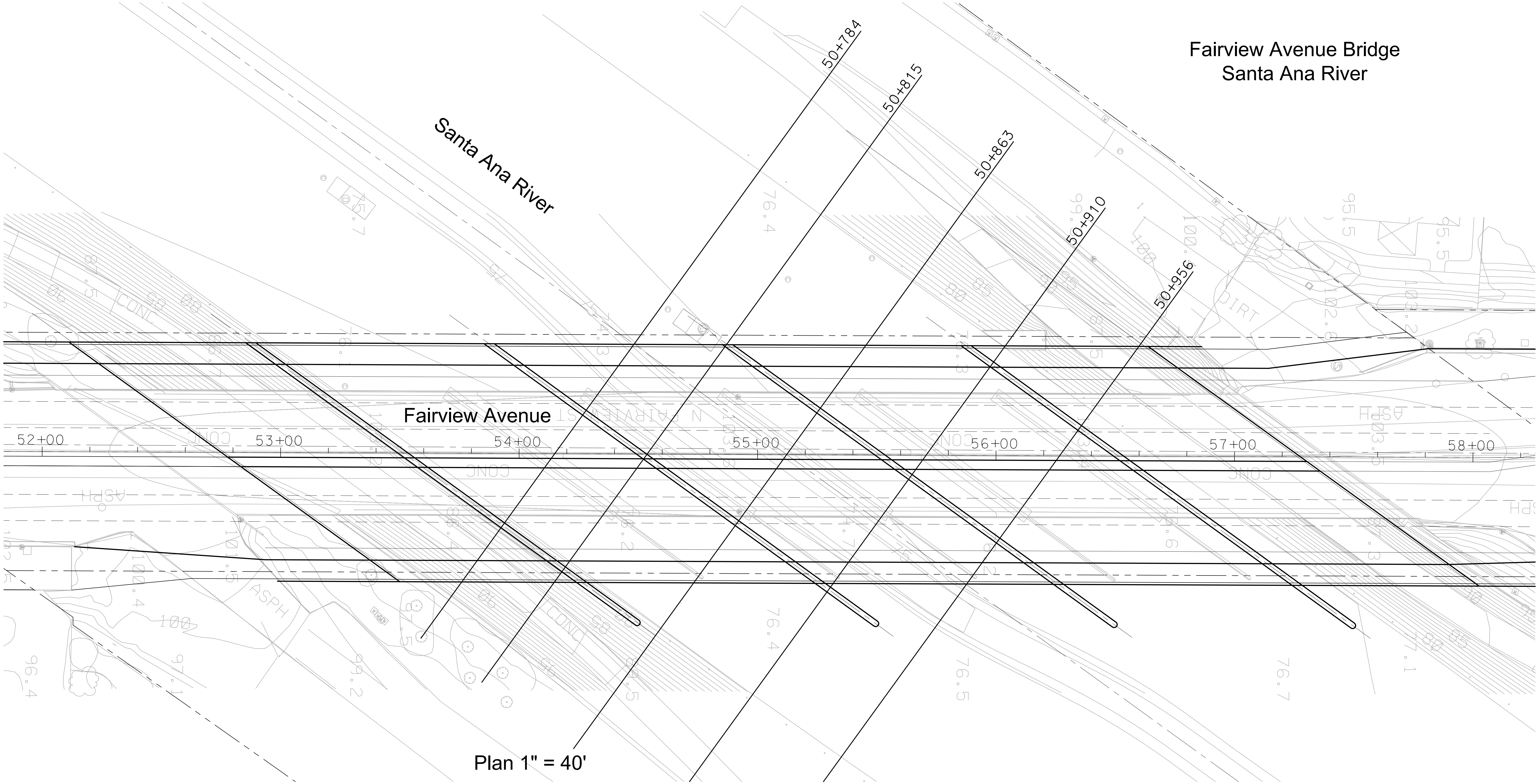
Prado RSM RAS Model-Levee 2a Plan: 1) PropBr RS50863 2/26/2019

SAR 50815 D/S FAIRVIEW.

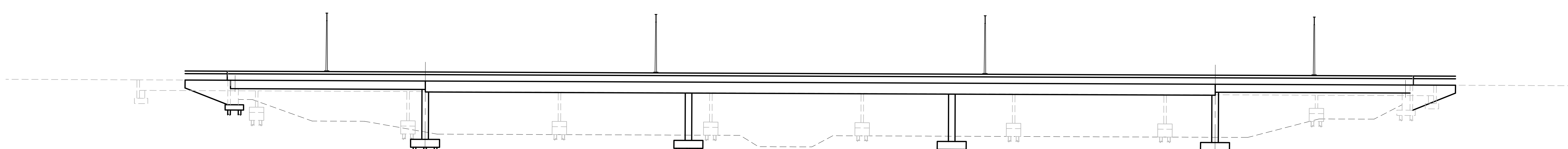


1 in Horiz. = 50 ft 1 in Vert. = 10 ft

Fairview Avenue Bridge
Santa Ana River



Plan 1" = 40'



Profile 1" = 40'

APPENDIX A

Appendix A Historic Property Survey Report

TRAFFIC IMPACT ANALYSIS

FAIRVIEW STREET IMPROVEMENTS FROM 9^{TH} STREET TO 16^{TH} STREET AND BRIDGE REPLACEMENT PROJECT

SANTA ANA, CALIFORNIA

This Traffic Impact Analysis has been prepared under the supervision of
Donson H. Liu, T.E.

Signed____________________

LICENSED PROFESSIONAL ENGINEER
DONSON H. LIU
TR 2743
EXP. 3/31/19
TRAFFIC
STATE OF CALIFORNIA

LSA

June 2018

TRAFFIC IMPACT ANALYSIS

FAIRVIEW STREET IMPROVEMENTS FROM 9TH STREET TO 16TH STREET AND BRIDGE REPLACEMENT PROJECT

SANTA ANA, CALIFORNIA

Submitted to:

City of Santa Ana
20 Civic Center Plaza
Santa Ana, California 92701

Prepared by:

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(949) 553-0666

Project No. WKE1702

June 2018

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LIST OF ABBREVIATIONS AND ACRONYMS

ADT	average daily traffic
bridge	Fairview Street bridge
City	City of Santa Ana
HCM	*Highway Capacity Manual*
ICU	Intersection Capacity Utilization
LOS	level of service
MPAH	Master Plan of Arterial Highways
NCHRP	National Cooperative Highway Research Program
OCTAM	Orange County Traffic Analysis Model
project	Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project
RIRO	right-in/right out
SAR	Santa Ana River
SCAG	Southern California Association of Governments
TAZ	Traffic Analysis Zone
TIA	Traffic Impact Analysis
v/c	volume-to-capacity ratios
vphpl	vehicle(s) per hour per lane

INTRODUCTION

This Traffic Impact Analysis (TIA) has been prepared to assess the effects of the Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project (project) on intersection and roadway performance. The project proposes to widen the Fairview Street crossing over the Santa Ana River (SAR) from four lanes (two lanes in each direction) to six lanes (three lanes in each direction) between the intersections of 9th Street and 16th Street in Santa Ana, California. This segment of Fairview Street includes a bridge (Fairview Street bridge) over the SAR. LSA performed this TIA consistent with relevant guidelines from the City of Santa Ana (City) Circulation Element and *Capacity Calculations and Level of Service Standards*.

The purpose of this TIA is to document how Fairview Street, between Civic Center Drive and 17th Street, would function without and with the project in the future. The study area comprises the following intersections:

1. Fairview Street/17th Street
2. Fairview Street/16th Street
3. Fairview Street/12th Street
4. Fairview Street/9th Street
5. Fairview Street/Civic Center Drive

This report analyzes roadway segments of Fairview Street between Civic Center Drive and 17th Street; specifically, the segments between each of the study intersections. Figure 1 shows the project area.

Existing Facilities

The City's Circulation Element and the Orange County Transportation Authority Master Plan of Arterial Highways (MPAH) identify Fairview Street between Civic Center Drive and 17th Street (over the SAR) as a six-lane, divided Major Arterial. The bridge currently provides two lanes in each direction. The segment of Fairview Street to the north of 16th Street currently provides two lanes in each direction, with the exception of a three lane southbound segment between Avalon Avenue and Bolivar Circle. Fairview Street south of 9th Street currently provides three lanes in each direction. Fairview Street has a posted speed limit of 45 miles per hour on segments north and south of the bridge.

Sidewalks exist on both sides of Fairview Street, with the exception of the segment on the bridge. Bicycle facilities, such as bicycle lanes, do not exist on Fairview Street; however, the Santa Ana River Trail that runs along the SAR's eastern bank has access points to both the northbound and the southbound sides of Fairview Street at the southern end of the bridge. The trail on the SAR's western bank does not have direct connections to Fairview Street. Figure 2 illustrates the roadway geometrics of the intersections within the study area.

Project Description

Implementation of the MPAH would widen Fairview Street bridge to accommodate three lanes in each direction. The project would also provide additional facilities, such as 8-foot-wide sidewalks

LEGEND

Proposed Areas of Potential Effects

Proposed Right of Way Acquisition

Existing Right of Way

Proposed Improvements

0 100 200
FEET

SOURCE: Bing (2015); WKE (2017)

FIGURE 1

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Project Area

Federal Project No.: BRLS 5063(184

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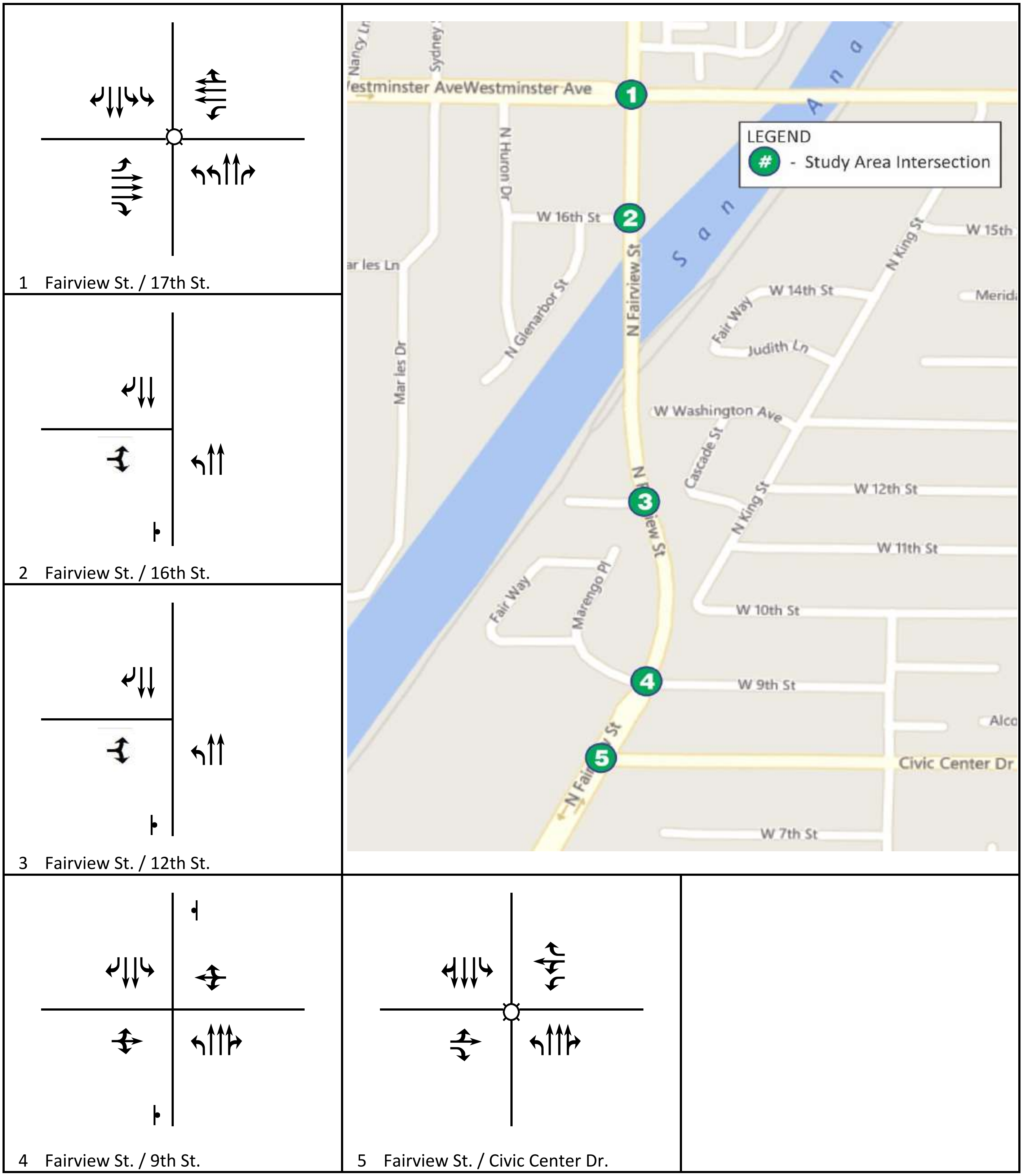

FIGURE 2

LSA

Legend

Signal

Stop Sign

F Free Right Turn

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Existing Facilities

P:\WKE1702\Traffic\excel\Fig 2 - Existing Facilities.xls 5/23/2018 and 5-foot-wide Class II bicycle lanes (with a 2-foot buffer) where they currently do not exist on both sides of Fairview Street between Civic Center Drive and 17th Street.

The planned improvements include the construction of a continuous raised median between 9th Street and 16th Street. This continuous raised median would change the intersection of Fairview Street/12th Street from full access to right-in/right-out (RIRO) access. Figure 3 illustrates intersection control changes associated with the project.

METHODOLOGY

LSA prepared this TIA consistent with the City's Circulation Element and *Capacity Calculations and Level of Service Standards.* Intersection level of service (LOS) calculations use the intersection capacity utilization (ICU) methodology for signalized intersections, whereas Highway Capacity Manual (HCM) methodology is used for unsignalized intersections. Roadway segment volume-to-capacity ratios (v/c) are determined using the City's theoretical daily roadway capacities. *Traffix* Version 8.0 computer software was used to determine the LOS at signalized intersections based on the ICU methodology, while *Synchro* Version 10.1 computer software was used at the unsignalized intersections using the HCM methodology.

The ICU methodology was implemented using City requirement inputs including 5 percent loss time, 1,700 vehicles per hour per lane (vphpl) capacity for through lanes, and 1,600 vphpl capacity for turn lanes. The ICU methodology compares the v/c ratios of conflicting turn movements at an intersection, sums these critical conflicting v/c ratios for each intersection approach, and determines the overall ICU. The HCM methodology calculates the delay experienced by vehicles passing through the intersection. The resulting ICU or delay is expressed in terms of LOS, where LOS A represents free-flow activity and LOS F represents overcapacity operation. LOS is a qualitative assessment of the quantitative effects of such factors as traffic volume, roadway geometrics, speed, delay, and maneuverability on roadway and intersection operations. The following table describes in detail LOS criteria for intersections.

LOS	Description
A	No approach phase is fully utilized by traffic, and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily, and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized, and a substantial number are nearing full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally, drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, speed can drop to zero.

LOS = level of service

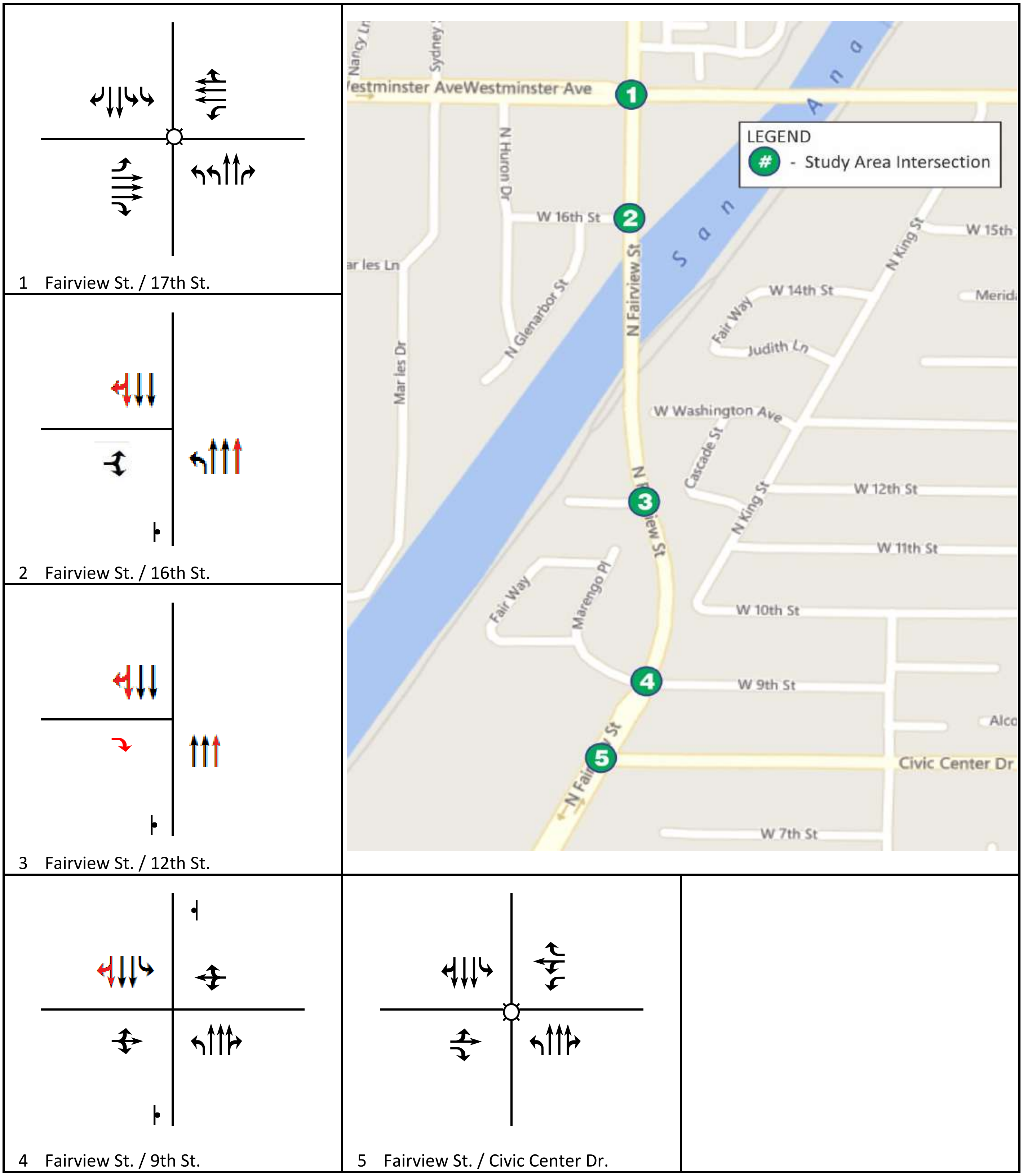

FIGURE 3

LSA

Legend

Signal

Stop Sign

F Free Right Turn

Project Change

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

With Project Facilities

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The relationship between LOS, ICU value (i.e., the v/c ratio), and HCM delay (at unsignalized intersections) is as follows:

Levels of Service	A	B	C	D	E	F
ICU	0.00–0.60	0.61–0.70	0.71–0.80	0.81–0.90	0.91–1.00	> 1.00
Delay per Vehicle (seconds)	≤10.0	10.0-15.0	15.0-25.0	25.0-35.0	35.0-50.0	>50.0

ICU = intersection capacity utilization

The City considers LOS D to be the upper limit of satisfactory intersection operations.

The four roadway segments between the five study intersections have been assessed for their adequacy in accommodating their respective existing and projected 24-hour daily traffic volumes according to roadway capacities and service standards prescribed by the City's Circulation Element. The relationship between daily traffic volumes and LOS is as follows:

Arterial Type	LOS A	LOS B	LOS C	LOS D	LOS E	LOS F
8 Lanes Divided	45,000	52,500	60,000	67,500	75,000	> 75,000
6 Lanes Divided	33,900	39,400	45,000	50,600	56,300	> 56,300
4 Lanes Divided	22,500	26,300	30,000	33,800	37,500	> 37,500
4 Lanes Undivided	15,000	17,500	20,000	22,500	25,000	> 25,000
2 Lanes Undivided	7,500	8,800	10,000	11,300	12,500	> 12,500

Source: City of Santa Ana General Plan Circulation Element, Table A-1 (January 2010)
LOS = level of service

Similar to the City's acceptability threshold for intersections, LOS D is considered to be the upper limit of satisfactory daily roadway volume-to-capacity.

EXISTING (2017) CONDITIONS

As noted previously, the City's Circulation Element and the MPAH identify the segment of Fairview Street between 17th Street and Civic Center Drive as a six-lane, divided Major Arterial. However, Fairview Street currently provides two lanes in each direction with a painted divided median between Civic Center Drive and 17th Street; the bridge itself provides two lanes in each direction with no median. The segment of Fairview Street to the north of 16th Street currently provides two lanes in each direction, with the exception of a three-lane southbound segment between Avalon Avenue and Bolivar Circle. Fairview Street south of 9th Street currently provides three lanes in each direction.

Pedestrian sidewalks are provided on both sides of Fairview Street with the exception of the bridge, which does not have sidewalks on either side. Currently, pedestrians walk along the northbound and southbound shoulders of Fairview Street. Bicycle facilities are also absent for the length of Fairview Street between Civic Center Drive and 17th Street. The Santa Ana River Trail connects to both the northbound and the southbound sides of Fairview Street at the southern end of the bridge.

Appendix A provides the peak-hour intersection turn volumes and a 24-hour daily roadway segment count National Data and Surveying Services collected on Tuesday, December 12, 2017. Figure 4 presents the existing a.m. and p.m. peak-hour volumes for the five study intersections.

Consistent with the intersection analysis methodology described previously, existing intersection LOS was calculated for the five study intersections. To calculate their daily LOS, existing daily traffic volumes along the roadway segments between the study intersections were compared against the design capacities of each segment. Table A depicts existing intersection LOS, while Table B shows roadway segment LOS. Appendix B provides intersection LOS worksheets.

Table A: Existing Intersection LOS Summary

Intersection		Existing Conditions			
		AM Peak Hour		PM Peak Hour	
		v/c Delay	LOS	v/c Delay	LOS
1	Fairview Street/17th Street	0.835	D	0.902	E
2	Fairview Street/16th Street[1]	31.6	D	20.0	C
3	Fairview Street/12th Street[1]	25.1	D	19.0	C
4	Fairview Street/9th Street[1]	>50.0	F	47.4	E
5	Fairview Street/Civic Center Drive	0.642	B	0.640	B

= unsatisfactory LOS
1 The intersection is unsignalized and was assessed using the HCM methodology. Delay values shown are in seconds per vehicle.
LOS = level of service
v/c = volume-to-capacity ratio
>50.0 = HCM delay value is greater than 50.0 seconds per vehicle, LOS F

Table B: Existing ADT Volumes and LOS

Roadway Segment		Arterial Type	Capacity	ADT	LOS
Existing Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,440	F
	16th Street to 12th Street – Fairview Bridge	4 Lanes Undivided	25,000	41,890	F
	12th Street to 9th Street	4 Lanes Divided	37,500	40,980	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	41,720	C

= unsatisfactory LOS
ADT = average daily traffic
LOS = level of service
v/c = volume-to-capacity

As Table A shows, the intersections of Fairview Street/17th Street and Fairview Street/9th Street currently operate at unsatisfactory LOS E or worse during one or both peak hours. The three other study intersections currently operate at satisfactory LOS D or better. It should be noted that the HCM methodology consistent delay values shown for the intersections of Fairview Street at 16th Street, 12th Street, and 9th Street are the calculated wait time of the worst performing movement and not indicative of the experience of the majority of vehicles traveling through these intersections. In the case of these three unsignalized intersections, the worst performing movements are the outbound left-turn movements, of which there are fewer than 10 vehicles per

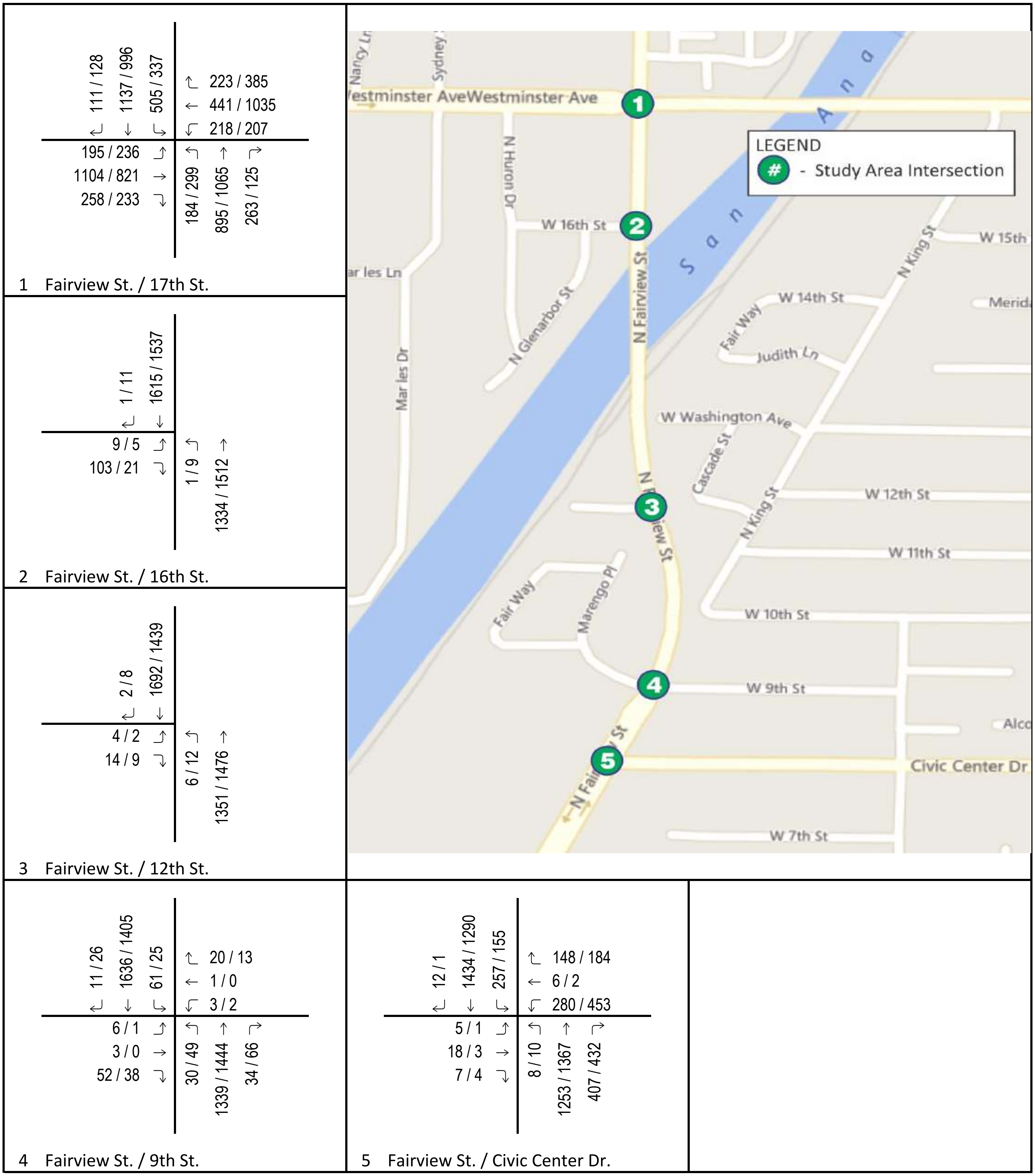


FIGURE 4

XXX / YYY AM / PM Volume

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Existing Traffic Volumes

hour at any one intersection. The especially high-delay values shown in Table A should not be considered representative of actual delay times due to typical driver behavior.

For example, high delays calculated for outbound movements at the intersection of Fairview Street and 9th Street that reach into the hundreds of seconds per vehicle would not be tolerated by drivers making outbound lefts. It is reasonable to expect drivers to make more feasible route choices such as making right turns out to make subsequent U-turns at downstream intersections, as they are available. As shown in Table B, the segments of Fairview Street (including the bridge) that provide only four lanes of travel currently experience daily traffic volumes greater than their respective design capacities, meaning these roadway segments currently experience unsatisfactory LOS F.

FUTURE CONDITIONS

LSA prepared future traffic forecasts (provided in Appendix C) for 2021 and 2040 No Build and Build conditions using the long-range traffic modeling tool, the Orange County Transportation Analysis Model (OCTAM). OCTAM is a travel demand model derived from the Southern California Association of Governments (SCAG) Regional Model that provides more specific land use and network information for Orange County. The 2021 traffic forecasts represent the anticipated conditions at the anticipated project completion year, whereas 2040 traffic forecasts represent long-range design year traffic conditions.

The intersection and roadway segment traffic volumes for 2040 No Build and Build conditions were developed using the OCTAM base year (2012) and future year (2040) model unconstrained networks. Raw traffic model data from OCTAM base and future year model runs were post-processed using National Cooperative Highway Research Program (NCHRP) 255 methodologies to develop peak-hour turning movement volumes at each study area intersection and roadway segment. The following describes the methodology used to post-process model volumes to develop peak hour intersection volumes for 2040 No Build and Build conditions:

1. The difference between the modeled 2012 and 2040 peak period directional arterial traffic volumes (for each intersection approach and departure) was identified from loaded network plots. This difference defines growth in traffic over the 28-year period.

2. The incremental growth in peak period approach and departure volumes between 2012 and 2040 was factored to develop the incremental change in peak-hour volumes. OCTAM uses a 3-hour a.m. peak period and a 4-hour p.m. peak period. SCAG has established that the a.m. peak hour accounts for 38 percent of the peak period and the p.m. peak hour is 28 percent of the peak period. Therefore, the incremental changes in peak period volumes were multiplied by the appropriate factors to develop incremental changes in peak-hour volumes.

3. The incremental growth in approach and departure volumes between 2012 and 2040 for each movement and peak hour was factored to reflect the forecast growth between the year of the existing traffic data (2017) and 2040. For this purpose, LSA assumed linear growth between the 2012 base condition and the forecast 2040 condition. As the increment between Existing and 2040 is 23 years of the 28-year time span, a factor of 0.82 (i.e., 23/28) was used.

4. The forecast growth in approach and departure volumes through 2040 No Build and Build conditions was added to the existing 2017 traffic data, resulting in "post-processed" 2040 No Build and Build link volumes. The approaches and departures along 16th, 12th, and 9th Streets are not anticipated to experience growth as these residential neighborhoods are built out.

5. The 2040 No Build and Build turn volumes were developed using existing (2017) turn volumes and the future approach and departure volumes, based on the methodologies contained in *NCHRP Report 255: Highway Traffic Data for Urbanized Area Project Planning and Design* (Transportation Research Board, December 1982).

A similar methodology (steps 1 through 4) was applied to develop 2040 No Build and Build roadway segment traffic volumes. For intersections that did not exist in the traffic model or had missing legs, anticipated growth (or lack thereof) from adjacent Traffic Analysis Zones (TAZs) were used to develop traffic volumes for those locations. Finally, manual adjustments were made to 2040 Build conditions to reflect the proposed change at the intersection of Fairview Street/12th Street from full access to RIRO.

The 2021 No Build and Build traffic forecasts were developed based on interpolating the overall growth between existing (2017) volumes and 2040 No Build and Build forecasts. Specifically, the proportional growth from 2017 to 2021 (4 years) was scaled against the overall growth between 2017 and 2040 (23 years) to develop a growth ratio of 17.39 percent. This growth percentage was applied to the growth between 2017 and 2040 forecasts at each study intersection and roadway segment to arrive at 2021 No Build and Build traffic forecasts.

Based on a review of the City's *Capital Improvement Program Fiscal year: 2017/2018* (City of Santa Ana, May 2017) and the Circulation Element, improvements to the five study intersections outside of the restriction of the intersection of Fairview Street and 12th Street from full-access to RIRO are not planned or included in this analysis at this time. The following presents the ability of the existing and proposed roadway facilities to accommodate 2021 and 2040 No Build and Build traffic conditions.

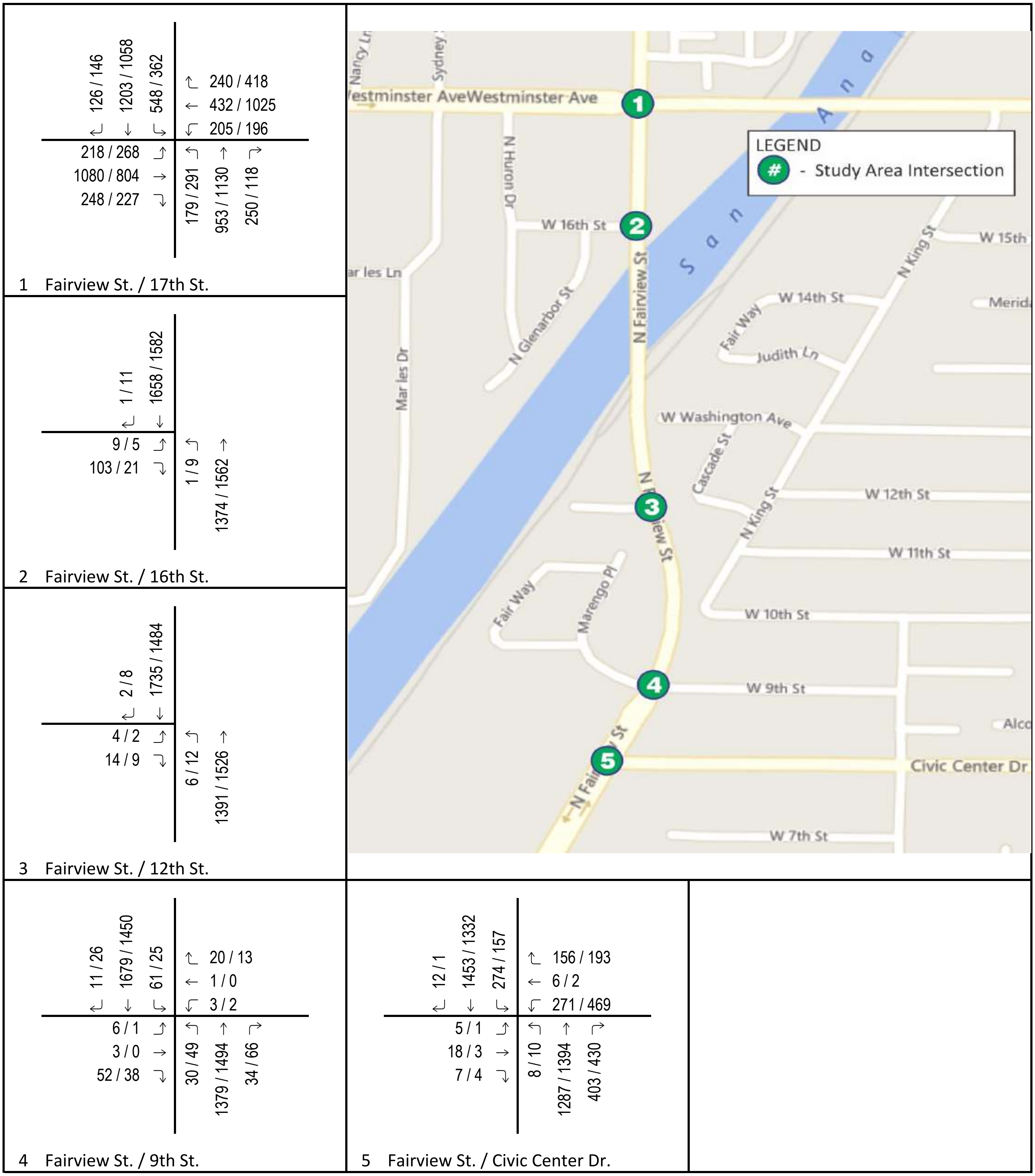
2021 No Build Conditions

Figure 5 shows the OCTAM forecast derived 2021 No Build a.m. and p.m. peak-hour traffic volumes. As shown in Table C, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS E during the p.m. peak hour)
- Fairview Street/9th Street (LOS F in both a.m. and p.m. peak hours)

This represents a general worsening of intersection operations under 2021 No Build conditions.

As shown in Table D, forecasted increases to daily traffic volumes along Fairview Street from existing to 2021 No Build conditions are anticipated to continue to result in unsatisfactory roadway segment LOS for the four-lane segments of Fairview Street.



LSA

XXX / YYY   AM / PM Volume

FIGURE 5

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project
2021 No Build Traffic Volumes

P:\WKE1702\Traffic\excel\Fig 5 - 2021 NP Vols.xls (5/23/2018)

Table C: 2021 Intersection LOS Summary

	Intersection	Existing Conditions				2021 No Build Conditions				2021 Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS
1	Fairview St/17th St	0.835	D	0.902	E	0.853	D	0.954	E	0.860	D	0.948	E
2	Fairview St/16th St[1]	31.6	D	20.0	C	33.9	D	20.7	C	>50.0	F	27.2	D
3	Fairview St/12th St[1]	25.1	D	19.0	C	26.0	D	19.7	C	22.1	C	18.0	C
4	Fairview St/9th St[1]	>50.0	F	47.4	E	>50.0	F	>50.0	F	>50.0	F	41.4	E
5	Fairview St/Civic Center Dr	0.642	B	0.640	B	0.664	B	0.651	B	0.691	B	0.665	B

= unsatisfactory LOS

[1] The intersection is unsignalized and was assessed using the HCM methodology. Delay values shown are in seconds per vehicle.

LOS = level of service

>50.0 = HCM delay value is greater than 50.0 seconds per vehicle, LOS F

v/c = volume-to-capacity ratio

Table D: 2021 ADT Volumes and LOS

Roadway Segment		Arterial Type	Capacity	ADT	LOS
Existing Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,440	F
	16th Street to 12th Street – Fairview Bridge	4 Lanes Undivided	25,000	41,890	F
	12th Street to 9th Street	4 Lanes Divided	37,500	40,980	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	41,720	C
2021 No Build Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,910	F
	16th Street to 12th Street – Fairview Bridge	4 Lanes Undivided	25,000	42,350	F
	12th Street to 9th Street	4 Lanes Divided	37,500	41,430	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	42,180	C
2021 Build Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	43,620	F
	16th Street to 12th Street – Fairview Bridge	6 Lanes Divided	56,300	43,050	C
	12th Street to 9th Street	6 Lanes Divided	56,300	42,110	C
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	42,880	C

= unsatisfactory LOS

ADT = average daily traffic

LOS = level of service

v/c = volume-to-capacity

2021 Build Conditions

Figure 6 shows the OCTAM forecast-derived 2021 Build a.m. and p.m. peak-hour traffic volumes. As shown in Table C, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS E during the p.m. peak hour)
- Fairview Street/16th Street (LOS F during the a.m. peak hour)
- Fairview Street/9th Street (LOS F during both the a.m. peak hour and LOS E in the p.m. peak hour)

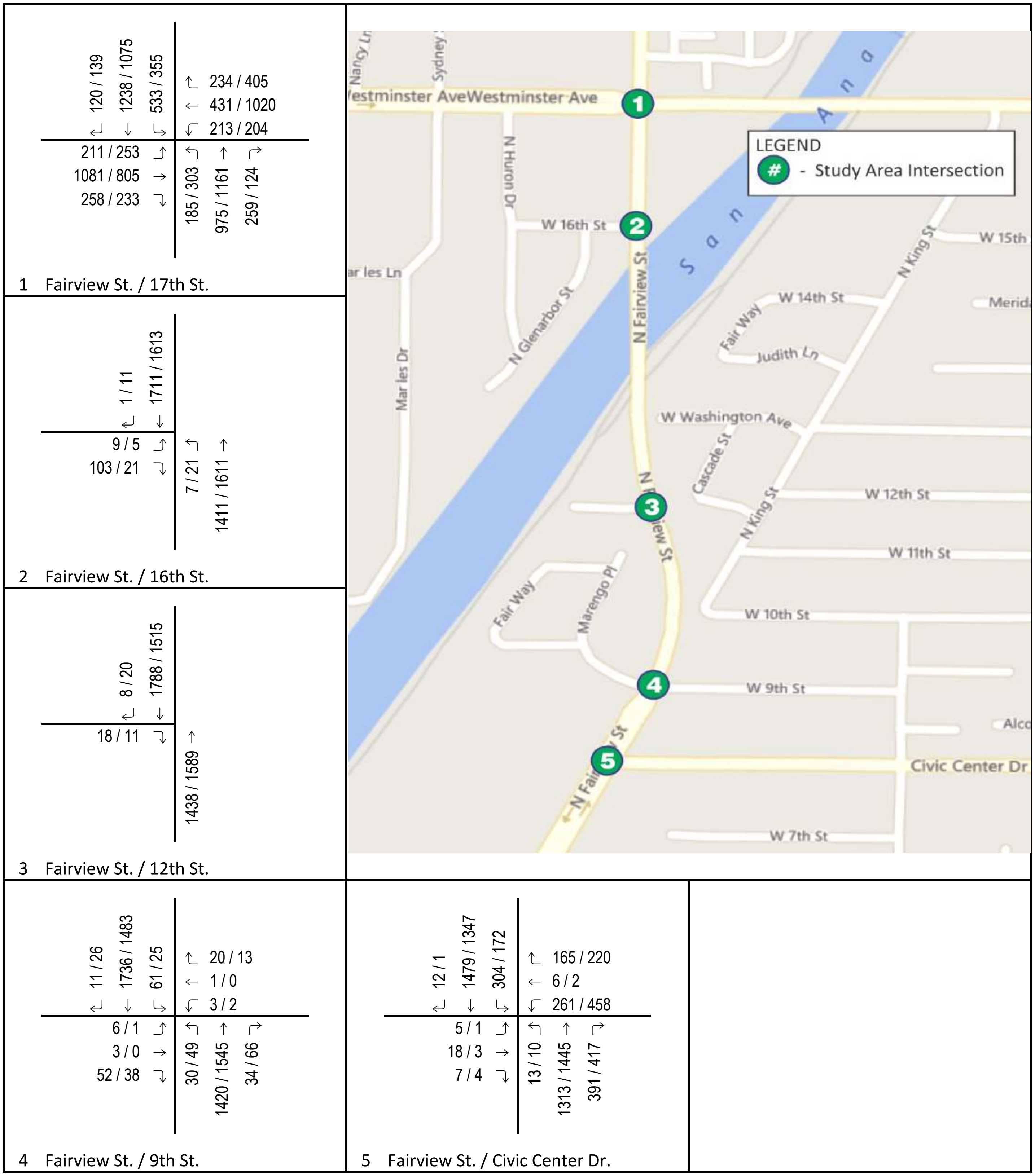


FIGURE 6

LSA

XXX / YYY AM / PM Volume

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

2021 Build Traffic Volumes

Several of the study intersections are shown to operate at higher levels of delay or capacity compared to the 2021 No Build condition because of the rerouting of regional north-south vehicular traffic from parallel routes that may now use Fairview Street due to the proposed improvements. Exceptions include the intersections of Fairview Street at 17th Street and 12th Street, which operate better due to reductions in travel patterns (higher north-south through traffic, while lower east-west turning movements at 17th Street) and changes in access (12th Street). It should be noted that implementation of the project would result in prolonged delay for the eastbound left-turn movements at the intersection of Fairview Street at 16th Street. This represents a worsening of access conditions to 9 a.m. and 5 p.m. peak-hour conditions.

As Table D shows, the proposed increase in roadway capacity to Fairview Street south of 16th Street is anticipated to accommodate both ambient existing to 2021 traffic growth and north-south regional traffic rebalancing at satisfactory LOS C. This is an improvement over both existing and 2021 No Build overcapacity traffic conditions.

2040 No Build Conditions

Figure 7 shows the OCTAM forecasted a.m. and p.m. peak-hour traffic volumes. As shown in Table E, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS F in both a.m. and p.m. peak hours)
- Fairview Street/16th Street (LOS E during the a.m. peak hour)
- Fairview Street/9th Street (LOS F in both a.m. and p.m. peak hours)

Table E: 2040 Intersection LOS Summary

	Intersection	Existing Conditions				2040 No Build Conditions				2040 Build Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS	v/c Delay	LOS
1	Fairview St/17th St	0.835	D	0.902	E	1.071	F	1.258	F	1.031	F	1.195	F
2	Fairview St/16th St[1]	31.6	D	20.0	C	48.1	E	24.9	C	>50.0	F	41.7	E
3	Fairview St/12th St[1]	25.1	D	19.0	C	32.0	D	23.4	C	30.6	D	22.3	C
4	Fairview St/9th St[1]	>50.0	F	47.4	E	>50.0	F	>50.0	F	>50.0	F	>50.0	F
5	Fairview St/Civic Center Dr	0.642	B	0.640	B	0.766	C	0.705	C	0.908	E	0.876	D

= unsatisfactory LOS
[1] The intersection is unsignalized and was assessed using the HCM methodology. Delay values shown are in seconds per vehicle.
LOS = level of service
>50.0 = HCM delay value is greater than 50.0 seconds per vehicle, LOS F
v/c = volume-to-capacity ratio

This represents a general worsening of intersection operations under 2040 No Build conditions.

As shown in Table F, forecasted increases to daily traffic volumes along Fairview Street from existing to 2040 No Build conditions are anticipated to continue to result in unsatisfactory roadway segment LOS for the four-lane segments of Fairview Street.

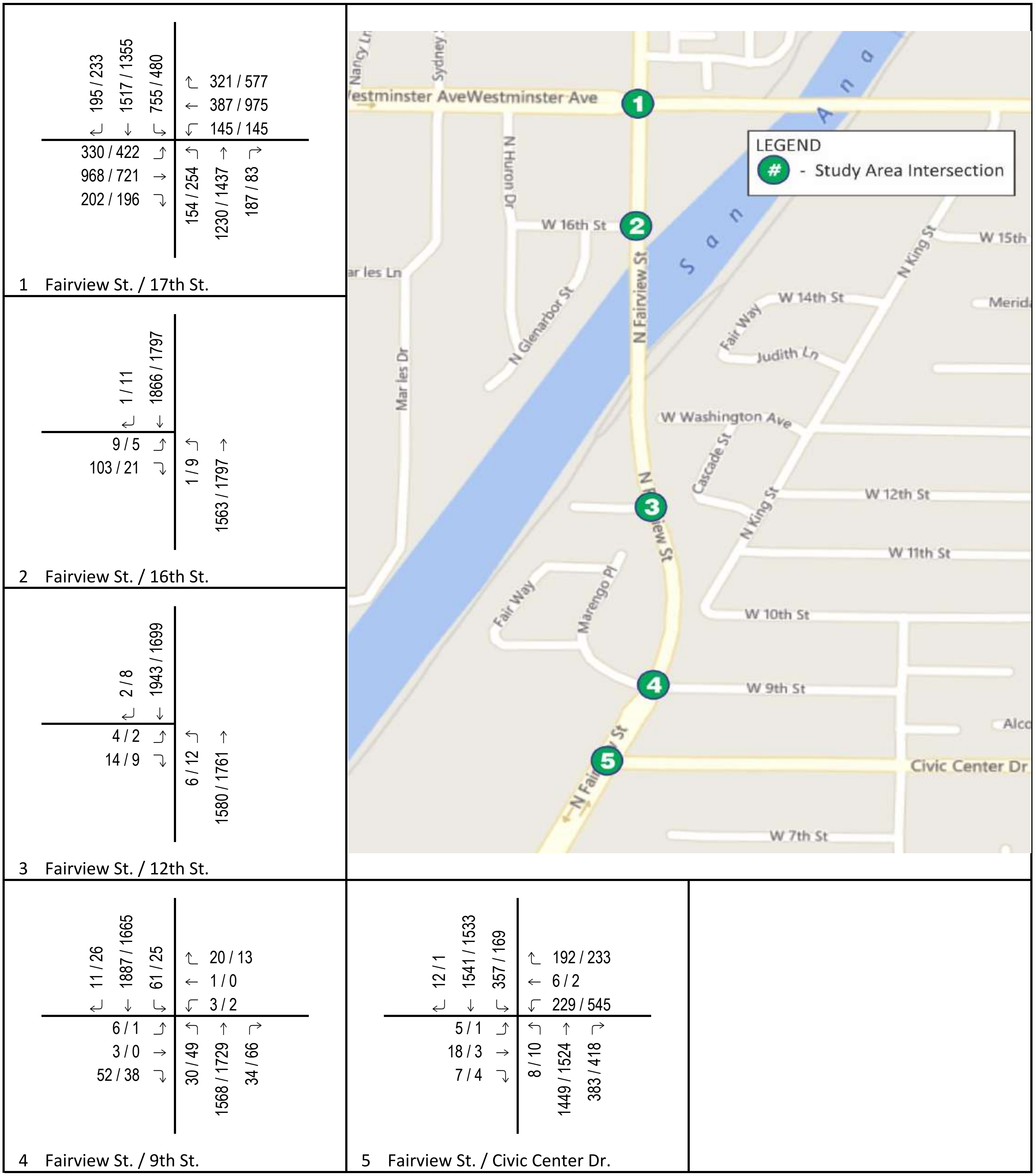


FIGURE 7

LSA

XXX / YYY AM / PM Volume

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

2040 No Build Traffic Volumes

Table F: 2040 ADT Volumes and LOS

Roadway Segment		Arterial Type	Capacity	ADT	LOS
Existing Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	42,440	F
	16th Street to 12th Street – Fairview Bridge	4 Lanes Undivided	25,000	41,890	F
	12th Street to 9th Street	4 Lanes Divided	37,500	40,980	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	41,720	C
2040 No Build Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	45,130	F
	16th Street to 12th Street – Fairview Bridge	4 Lanes Undivided	25,000	44,540	F
	12th Street to 9th Street	4 Lanes Divided	37,500	43,580	F
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	44,360	C
2040 Build Conditions					
Fairview Street	17th Street to 16th Street	4 Lanes Divided	37,500	49,200	F
	16th Street to 12th Street – Fairview Bridge	6 Lanes Divided	56,300	48,560	D
	12th Street to 9th Street	6 Lanes Divided	56,300	47,510	D
	9th Street to Civic Center Drive	6 Lanes Divided	56,300	48,360	D

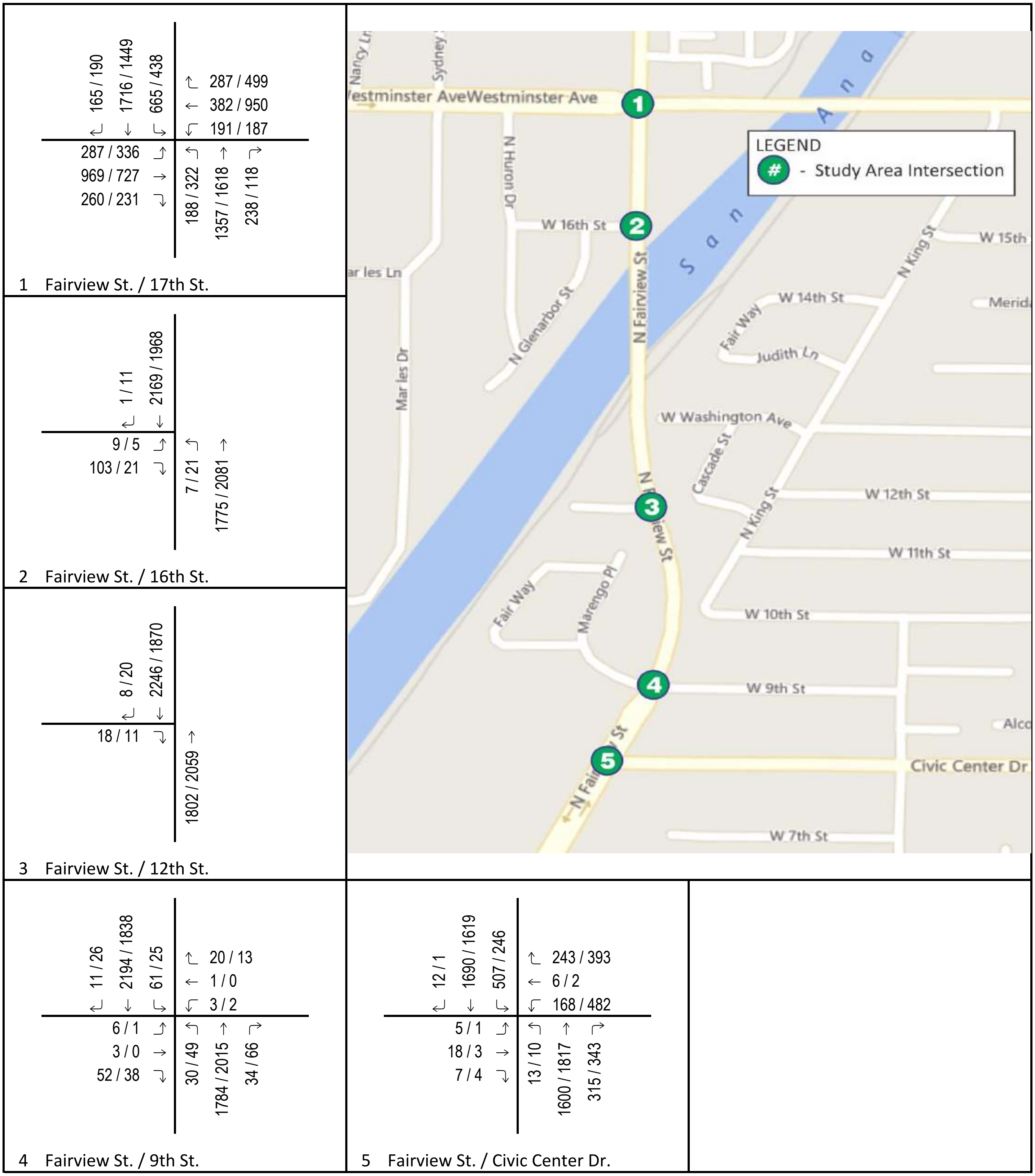
= unsatisfactory LOS
ADT = average daily traffic
LOS = level of service
v/c = volume-to-capacity

2040 Build Conditions

Figure 8 shows the OCTAM forecasted a.m. and p.m. peak-hour traffic volumes. As shown in Table E, the intersections along Fairview Street are anticipated to operate at acceptable LOS with the exception of the following intersections:

- Fairview Street/17th Street (LOS F during both the a.m. and the p.m. peak hours)
- Fairview Street/16th Street (LOS F during the a.m. peak hour and LOS E during the p.m. peak hour)
- Fairview Street/9th Street (LOS F during both the a.m. and the p.m. peak hours)
- Fairview Street/Civic Center Drive (LOS E during the a.m. peak hour)

Like the analysis results for 2021 Build condition, several of the study intersections are shown to operate at higher levels of delay or capacity under 2040 Build condition, compared to the 2040 No Build condition, because of the rerouting of regional north-south vehicular traffic from parallel routes that may now use Fairview Street due to the proposed improvements. Exceptions include the intersections of Fairview Street at 17th Street and 12th Street, which operate better due to reductions in travel patterns (higher north-south through traffic while lower east-west turning movements at 17th Street) and changes in access (12th Street).



LSA

FIGURE 8

XXX / YYY AM / PM Volume

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

2040 Build Traffic Volumes

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The intersection of Fairview Street at 16th Street experiences a worsening of HCM based delay values in the 2040 p.m. peak hour from an acceptable 24.9 second/vehicle LOS "C" in the No Build condition to an unacceptable 41.7 second/vehicle LOS "E" in the Build condition. As previously mentioned, the HCM delay value represents the calculated delay of the worst performing movement in a given intersection and not indicative of the experience of the majority of vehicles traveling through these intersections. As this resulting additional deficient operation is indicative of only the worst performing movement, in this case the 5 eastbound left-turning vehicles in the p.m. peak hour, this delay value and LOS is not considered to be indicative of the overall intersection and is not considered a significant impact.

It should be noted that implementation of the project would result in an additional unsatisfactorily operating intersection (the intersection of Fairview Street and Civic Center Drive) compared to the deficient intersections identified under the 2040 No Build condition. Regional growth between existing and 2040 No Build conditions would contribute to the unacceptable peak-hour operations at the intersection of Fairview Street at Civic Center Drive to result in such a level of significant impact.

As shown previously in Table F, the proposed increase in roadway capacity to Fairview Street south of 16th Street is anticipated to accommodate both ambient existing to 2040 traffic growth and regional north-south regional traffic rebalancing at satisfactory LOS D. This is an improvement over both existing and 2040 No Build overcapacity traffic conditions.

UNSIGNALIZED QUEUING ANALYSIS

To determine the necessary turn pocket lengths at the intersections of Fairview Street/16th Street and Fairview Street/9th Street that would be affected by the project, LSA conducted an HCM based queuing analysis for 2040 Build traffic conditions. Table G shows the results of this queuing analysis.

Table G: 2040 Build Fairview Street Turn Pocket Queuing

Intersection	Movement	Existing Pocket Length (feet)	95th percentile queue (feet)[1]	
			AM Peak Hour	PM Peak Hour
Fairview Street/16th Street	Northbound Left	50	< 25	< 25
Fairview Street/9th Street	Northbound Left	55	33	38
	Southbound Left	95	48	< 25

[1] Queue length is based on a design vehicle length of 25 feet. Queue lengths less than one vehicle in length are noted as "< 25" to signify that a minimum of one vehicle length of queueing storage should be provided.

Because the existing intersection geometrics have storage lengths that exceed the calculated queue lengths, modifications to existing pocket lengths are not necessary to accommodate 2040 Build traffic queues and are not recommended at this time. Appendix B provides HCM calculated queues on the Synchro LOS worksheets.

MITIGATION MEASURE

As described previously, the proposed improvement of Fairview Street from four through lanes to six through lanes could result in a significant impact at the intersection of Fairview Street and Civic

Center Drive under 2040 Build a.m. peak-hour conditions. To mitigate the potentially impacted a.m. peak-hour condition, the following mitigation measure is proposed:

- Restripe the westbound shared left-through turn lane to a shared left-through-right turn lane.

The allowance of westbound right turns from the westbound shared left-through turn lane is anticipated to improve the 2040 Build condition a.m. peak-hour intersection v/c ratio from a deficient 0.908 (LOS E) to an acceptable 0.842 (LOS D). The 2040 Build condition p.m. peak-hour intersection v/c ratio is anticipated to improve from an acceptable 0.876 (LOS D) to an acceptable 0.810 (LOS D).

As this impact and deficiency are not anticipated to occur until the 2040 Build condition, it is recommended that this improvement not be implemented until deemed necessary. This should be done through intersection operations monitoring (particularly of the westbound right-turn movement) by City staff.

CONCLUSIONS

The existing conditions analysis shows that the roadway of Fairview Street between 9th Street and 16th Street experiences higher levels of daily traffic than what the current roadway configuration is designed for. The proposed improvement of Fairview Street from four through lanes to six through lanes between 9th Street and 16th Street is anticipated to accommodate future traffic volumes within capacity at satisfactory LOS.

The additional capacity afforded to north-south traffic along Fairview Street will not alleviate, and may increase, anticipated delays to left-turning vehicles entering and exiting the unsignalized streets of 16th Street, 12th Street, and 9th Street. Once the project is completed, vehicles turning in/out of the residential neighborhoods may utilize alternate routes along Fairview Street, such as U-turns, to more conveniently travel to their intended destinations. This potential rerouting of left-turns would affect a modest number of vehicles, less than 10 per peak hour at any one intersection.

Additionally, the project’s improvement to north-south traffic capacity along Fairview Street is anticipated to result in unacceptable LOS E operations at the intersection of Fairview Street and Civic Center Drive under the 2040 Build a.m. peak-hour condition. The project’s significant impact can be mitigated through the restriping of the westbound shared left-through turn lane to a shared left-through-right turn lane. As this impact is not anticipated to occur until 2040 Build conditions, it is recommended that this improvement not be implemented until it is determined by City staff that the intersection may be approaching deficient levels of operation.

Pedestrian and bicyclist facilities along Fairview Street that currently exist on both sides of the bridge but not on the bridge itself would be connected by sidewalks and Class II bike lanes that are part of the project. The closure of this gap in the pedestrian network will benefit pedestrians traveling between destinations north of 17th Street, such as Leroy L. Doig Intermediate School, Samueli Academy, the Stater Bros. Market, and the residential community south of the SAR.

APPENDIX A

EXISTING COUNTS

Prepared by National Data & Surveying Services

Fairview St & 17th St

Peak Hour Turning Movement Count

ID: 17-01276-001
City: Santa Ana

Day: Tuesday
Date: 12/12/2017

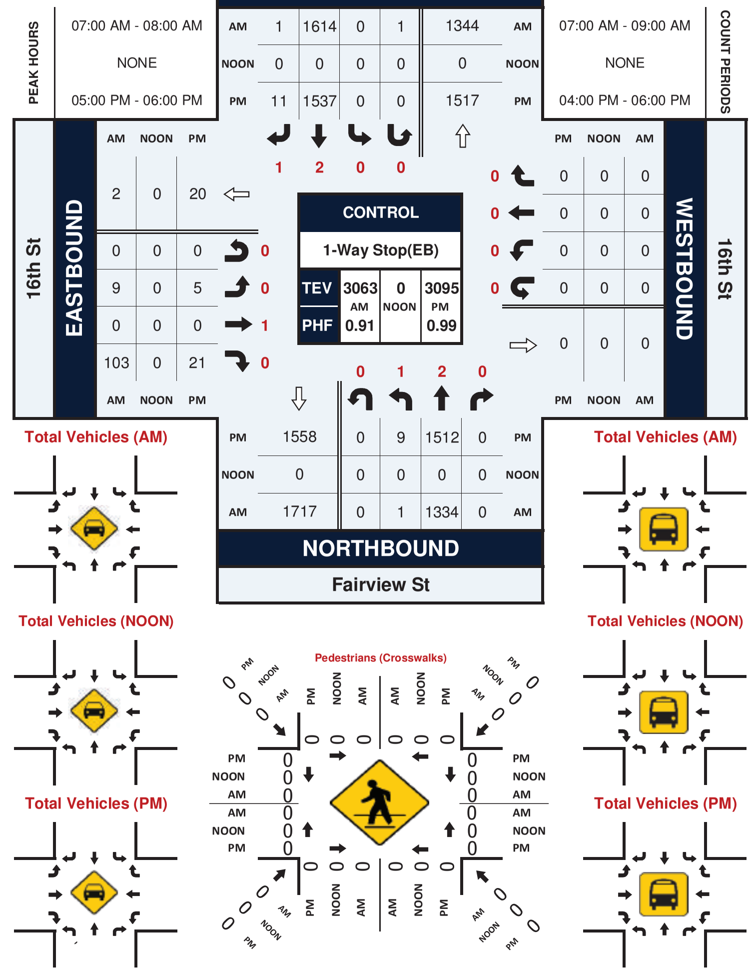
Prepared by National Data & Surveying Services

Fairview St & 16th St

Peak Hour Turning Movement Count

ID: 17-01276-002
City: Santa Ana

Day: Tuesday
Date: 12/12/2017



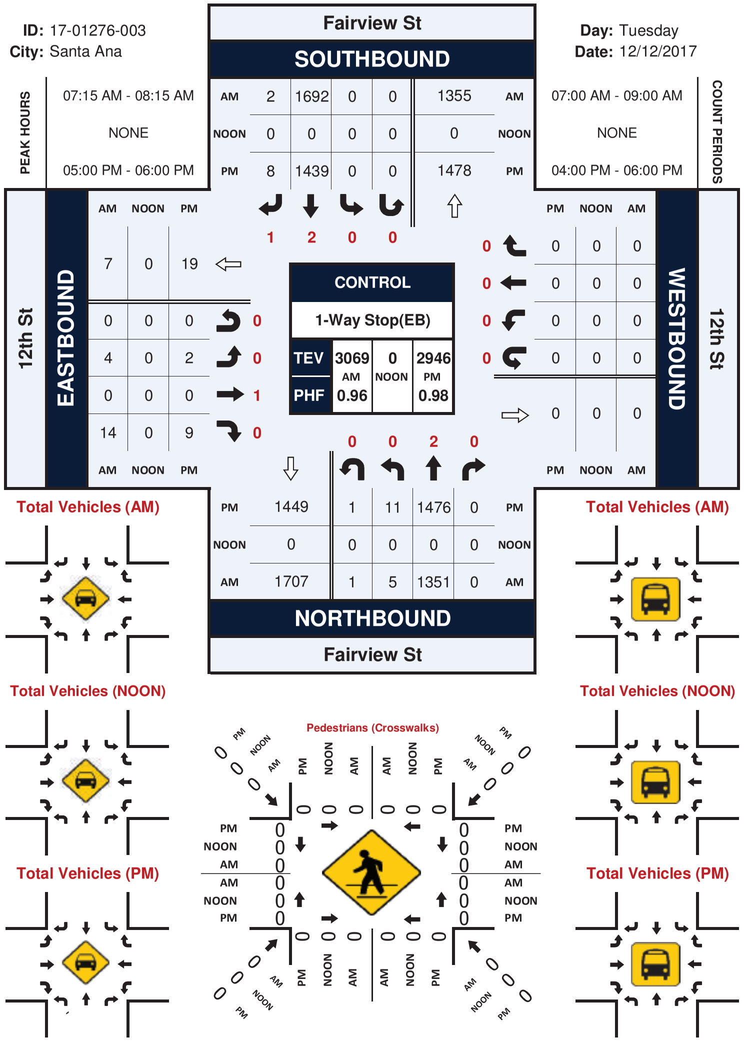
Prepared by National Data & Surveying Services

Fairview St & 12th St

Peak Hour Turning Movement Count

ID: 17-01276-003
City: Santa Ana

Day: Tuesday
Date: 12/12/2017



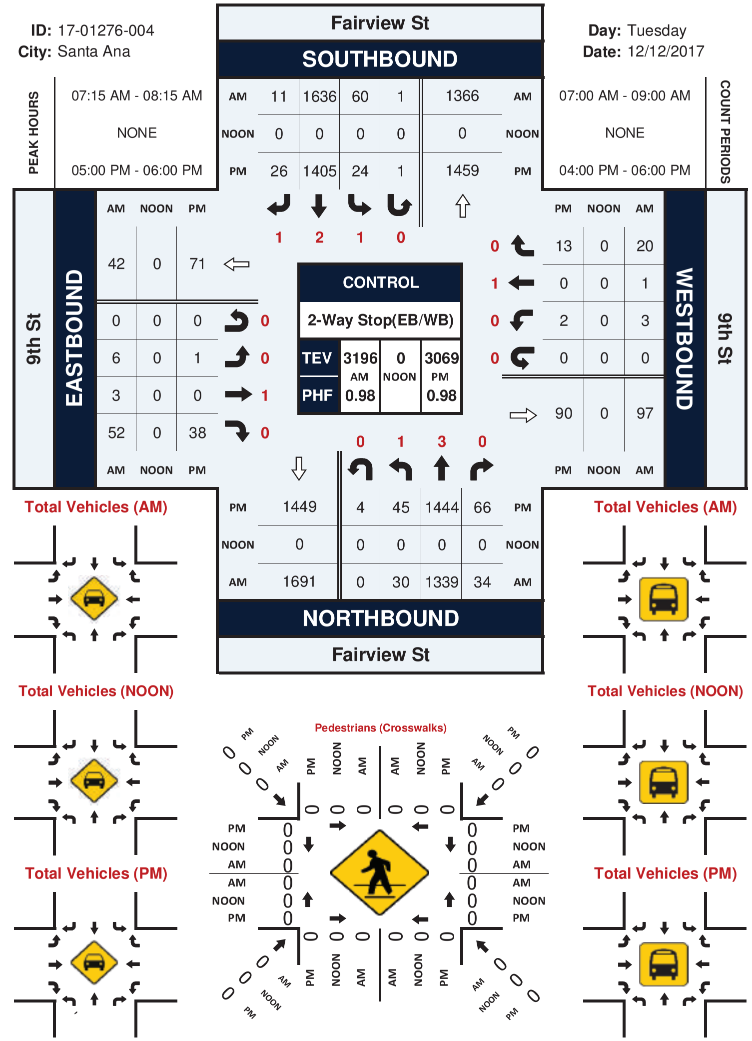
Prepared by National Data & Surveying Services

Fairview St & 9th St

Peak Hour Turning Movement Count

ID: 17-01276-004
City: Santa Ana

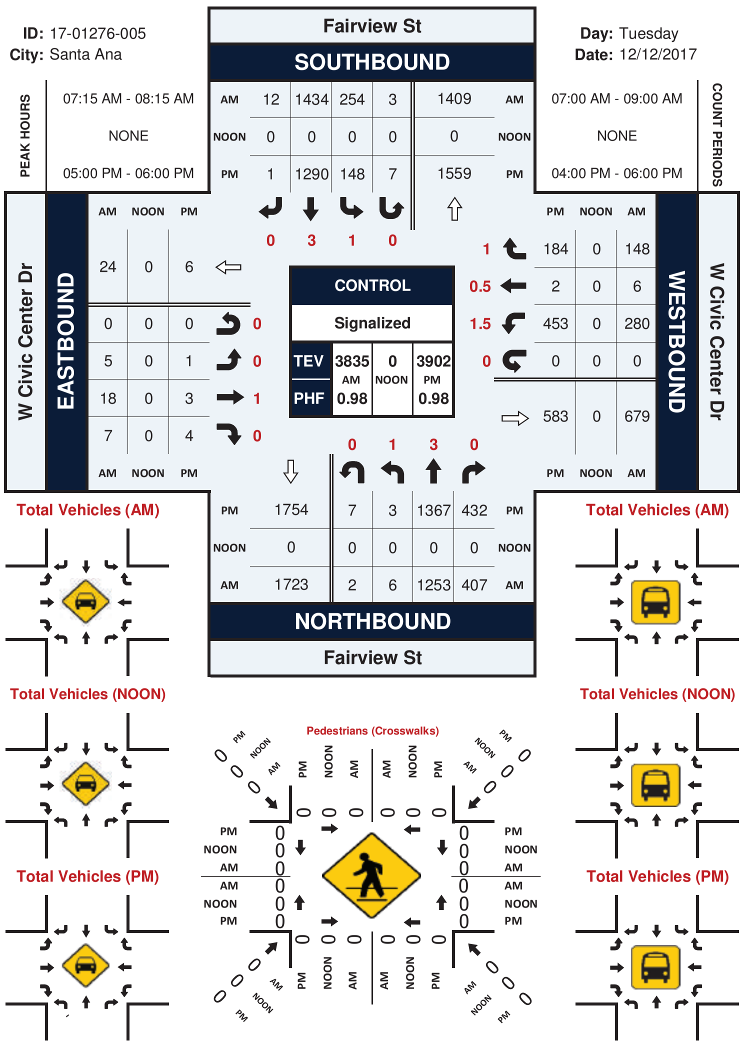
Day: Tuesday
Date: 12/12/2017



Prepared by National Data & Surveying Services

Fairview St & W Civic Center Dr

Peak Hour Turning Movement Count



Prepared by NDS/ATD

VOLUME

Fairview St & Santa Ana River Trail

Day: Thursday
Date: 12/14/2017

City: Santa Ana
Project #: CA17_1277_001

DAILY TOTALS	NB	SB	EB	WB	Total
	19,943	21,947	0	0	41,890

AM Period	NB		SB		EB	WB	TOTAL	
00:00	47		50				97	
00:15	44		41				85	
00:30	39		42				81	
00:45	21	151	39	172			60	323
01:00	26		32				58	
01:15	24		33				57	
01:30	18		18				36	
01:45	20	88	21	104			41	192
02:00	26		30				56	
02:15	15		32				47	
02:30	25		24				49	
02:45	22	88	19	105			41	193
03:00	19		23				42	
03:15	31		37				68	
03:30	34		29				63	
03:45	34	118	50	139			84	257
04:00	52		40				92	
04:15	80		47				127	
04:30	111		65				176	
04:45	97	340	106	258			203	598
05:00	106		90				196	
05:15	184		179				363	
05:30	165		187				352	
05:45	166	621	205	661			371	1282
06:00	176		228				404	
06:15	185		253				438	
06:30	241		312				553	
06:45	252	854	352	1145			604	1999
07:00	300		411				711	
07:15	316		419				735	
07:30	309		410				719	
07:45	332	1257	414	1654			746	2911
08:00	302		366				668	
08:15	313		380				693	
08:30	334		423				757	
08:45	329	1278	432	1601			761	2879
09:00	304		362				666	
09:15	274		328				602	
09:30	258		304				562	
09:45	267	1103	318	1312			585	2415
10:00	246		289				535	
10:15	233		271				504	
10:30	227		263				490	
10:45	256	962	278	1101			534	2063
11:00	236		269				505	
11:15	218		242				460	
11:30	265		283				548	
11:45	222	941	251	1045			473	1986
TOTALS	7801		9297				17098	
SPLIT %	45.6%		54.4%				40.8%	

PM Period	NB		SB		EB	WB	TOTAL	
12:00	251		260				511	
12:15	252		278				530	
12:30	248		260				508	
12:45	259	1010	283	1081			542	2091
13:00	251		275				526	
13:15	244		266				510	
13:30	279		309				588	
13:45	241	1015	276	1126			517	2141
14:00	276		305				581	
14:15	328		361				689	
14:30	284		310				594	
14:45	318	1206	372	1348			690	2554
15:00	340		385				725	
15:15	321		354				675	
15:30	281		316				597	
15:45	327	1269	332	1387			659	2656
16:00	342		358				700	
16:15	334		346				680	
16:30	347		365				712	
16:45	349	1372	364	1433			713	2805
17:00	334		345				679	
17:15	350		367				717	
17:30	346		356				702	
17:45	358	1388	363	1431			721	2819
18:00	342		352				694	
18:15	339		342				681	
18:30	318		316				634	
18:45	315	1314	314	1324			629	2638
19:00	280		279				559	
19:15	248		272				520	
19:30	290		239				529	
19:45	237	1055	221	1011			458	2066
20:00	272		237				509	
20:15	252		257				509	
20:30	201		238				439	
20:45	235	960	226	958			461	1918
21:00	233		205				438	
21:15	260		173				433	
21:30	166		190				356	
21:45	176	835	163	731			339	1566
22:00	138		150				288	
22:15	111		144				255	
22:30	93		139				232	
22:45	102	444	82	515			184	959
23:00	70		94				164	
23:15	85		81				166	
23:30	69		70				139	
23:45	50	274	60	305			110	579
TOTALS	12142		12650				24792	
SPLIT %	49.0%		51.0%				59.2%	

DAILY TOTALS	NB	SB	EB	WB	Total
	19,943	21,947	0	0	41,890

	NB	SB	EB	WB	Total
AM Peak Hour	07:45	07:00			07:00
AM Pk Volume	1281	1654			2911
Pk Hr Factor	0.959	0.987			0.976
7 - 9 Volume	2535	3255	0	0	5790
7 - 9 Peak Hour	07:45	07:00			07:00
7 - 9 Pk Volume	1281	1654	0	0	2911
Pk Hr Factor	0.959	0.987	0.000	0.000	0.976

	NB	SB	EB	WB	Total
PM Peak Hour	17:15	16:30			17:15
PM Pk Volume	1396	1441			2834
Pk Hr Factor	0.975	0.982			0.983
4 - 6 Volume	2760	2864	0	0	5624
4 - 6 Peak Hour	17:00	16:30			16:30
4 - 6 Pk Volume	1388	1441	0	0	2821
Pk Hr Factor	0.969	0.982	0.000	0.000	0.984

APPENDIX B

LOS WORKSHEETS

```
ExAM                      Thu Apr 26, 2018 17:35:45                 Page 2-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                              Existing Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------

                       Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
********************************************************************************
Cycle (sec):          100              Critical Vol./Cap.(X):         0.835
Loss Time (sec):        5              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         60              Level Of Service:                  D
********************************************************************************
Street Name:          Fairview Street                 West 17th Street
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0
Lanes:        2  0  2  0  1   2  0  2  0  1   1  0  3  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     184   895   263   505  1137   111   195  1104   258   218   441   223
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  184   895   263   505  1137   111   195  1104   258   218   441   223
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:   184   895   263   505  1137   111   195  1104   258   218   441   223
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  184   895   263   505  1137   111   195  1104   258   218   441   223
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  184   895   263   505  1137   111   195  1104   258   218   441   223
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700  1700  1700  1700  1700  1700  1700  1700  1700  1700  1700  1700
Adjustment:  0.88  1.00  0.94  0.88  1.00  0.94  0.94  1.00  0.94  0.94  1.00  0.94
Lanes:       2.00  2.00  1.00  2.00  2.00  1.00  1.00  3.00  1.00  1.00  2.00  1.00
Final Sat.:  2992  3400  1598  2992  3400  1598  1598  5100  1598  1598  3400  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06  0.26  0.16  0.17  0.33  0.07  0.12  0.22  0.16  0.14  0.13  0.14
Crit Moves:         ****   ****                     ****   ****
********************************************************************************

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Intersection						
Int Delay, s/veh	1.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	103	1	1334	1615	1
Future Vol, veh/h	9	103	1	1334	1615	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	65
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	113	1	1466	1775	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2510	888	1776	0	-	0
Stage 1	1775	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	23	287	346	-	-	-
Stage 1	121	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	23	287	346	-	-	-
Mov Cap-2 Maneuver	111	-	-	-	-	-
Stage 1	121	-	-	-	-	-
Stage 2	435	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.6	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	346	-	255	-	-
HCM Lane V/C Ratio	0.003	-	0.483	-	-
HCM Control Delay (s)	15.4	-	31.6	-	-
HCM Lane LOS	C	-	D	-	-
HCM 95th %tile Q(veh)	0	-	2.4	-	-

Intersection						
Int Delay, s/veh	0.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	14	6	1351	1692	2
Future Vol, veh/h	4	14	6	1351	1692	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	110
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	15	6	1407	1763	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2479	882	1765	0	-	0
Stage 1	1763	-	-	-	-	-
Stage 2	716	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	24	289	350	-	-	-
Stage 1	123	-	-	-	-	-
Stage 2	445	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	24	289	350	-	-	-
Mov Cap-2 Maneuver	94	-	-	-	-	-
Stage 1	121	-	-	-	-	-
Stage 2	445	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	25.1	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	350	-	198	-	-
HCM Lane V/C Ratio	0.018	-	0.095	-	-
HCM Control Delay (s)	15.5	-	25.1	-	-
HCM Lane LOS	C	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection												
Int Delay, s/veh	6.5											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	52	3	1	20	30	1339	34	61	1636	11
Future Vol, veh/h	6	3	52	3	1	20	30	1339	34	61	1636	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	145
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	3	53	3	1	20	31	1366	35	62	1669	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2402	3256	835	2406	3250	701	1680	0	0	1401	0	0
Stage 1	1793	1793	-	1446	1446	-	-	-	-	-	-	-
Stage 2	609	1463	-	960	1804	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	25	9	311	25	9	327	377	-	-	249	-	-
Stage 1	82	131	-	98	195	-	-	-	-	-	-	-
Stage 2	421	191	-	269	130	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	16	6	311	10	6	327	377	-	-	249	-	-
Mov Cap-2 Maneuver	16	6	-	10	6	-	-	-	-	-	-	-
Stage 1	75	98	-	90	179	-	-	-	-	-	-	-
Stage 2	360	175	-	162	98	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	249	156	0.3	0.9
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	377	-	-	59	45	249	-	-
HCM Lane V/C Ratio	0.081	-	-	1.055	0.544	0.25	-	-
HCM Control Delay (s)	15.4	-	-	249	156	24.2	-	-
HCM Lane LOS	C	-	-	F	F	C	-	-
HCM 95th %tile Q(veh)	0.3	-	-	5	2	1	-	-

```
---------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                             Existing Conditions
                                AM Peak Hour
---------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
*********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.642
Loss Time (sec):       5              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        32              Level Of Service:                  B
*********************************************************************************
Street Name:         Fairview Street            West Civic Center Drive
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       8 1253   407   257 1434    12     5   18     7   280    6   148
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    8 1253   407   257 1434    12     5   18     7   280    6   148
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     8 1253   407   257 1434    12     5   18     7   280    6   148
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    8 1253   407   257 1434    12     5   18     7   280    6   148
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    8 1253   407   257 1434    12     5   18     7   280    6   148
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.94 1.00  1.00  0.94 1.00  1.00  1.00 1.00  0.94  0.97 1.00  0.94
Lanes:       1.00 2.26  0.74  1.00 2.98  0.02  0.22 0.78  1.00  1.96 0.04  1.00
Final Sat.:  1598 3850  1250  1598 5058    42   370 1330  1598  3227   71  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.33  0.33  0.16 0.28  0.28  0.01 0.01  0.00  0.09 0.08  0.09
Crit Moves:       ****        ****                   ****                   ****
*********************************************************************************
```



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---------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                             Existing Conditions
                                PM Peak Hour
---------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
*********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.902
Loss Time (sec):       5              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        88              Level Of Service:                  E
*********************************************************************************
Street Name:         Fairview Street                West 17th Street
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        2  0  2  0  1   2  0  2  0  1   1  0  3  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     299 1065   125   337  996   128   236  821   233   207 1035   385
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  299 1065   125   337  996   128   236  821   233   207 1035   385
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   299 1065   125   337  996   128   236  821   233   207 1035   385
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  299 1065   125   337  996   128   236  821   233   207 1035   385
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  299 1065   125   337  996   128   236  821   233   207 1035   385
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.88 1.00  0.94  0.88 1.00  0.94  0.94 1.00  0.94  0.94 1.00  1.00
Lanes:       2.00 2.00  1.00  2.00 2.00  1.00  1.00 3.00  1.00  1.00 2.19  0.81
Final Sat.:  2992 3400  1598  2992 3400  1598  1598 5100  1598  1598 3717  1383
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.31  0.08  0.11 0.29  0.08  0.15 0.16  0.15  0.13 0.28  0.28
Crit Moves:       ****        ****        ****                        ****
*********************************************************************************
```

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	21	9	1512	1537	11
Future Vol, veh/h	5	21	9	1512	1537	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	65
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	21	9	1527	1553	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2335	777	1564	0	-	0
Stage 1	1553	-	-	-	-	-
Stage 2	782	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	31	340	418	-	-	-
Stage 1	160	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	30	340	418	-	-	-
Mov Cap-2 Maneuver	139	-	-	-	-	-
Stage 1	156	-	-	-	-	-
Stage 2	411	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	418	-	266	-	-
HCM Lane V/C Ratio	0.022	-	0.099	-	-
HCM Control Delay (s)	13.8	-	20	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	9	12	1476	1439	8
Future Vol, veh/h	2	9	12	1476	1439	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	110
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	12	1506	1468	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2245	734	1476	0	-	0
Stage 1	1468	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	35	363	452	-	-	-
Stage 1	178	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	34	363	452	-	-	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	173	-	-	-	-	-
Stage 2	414	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	452	-	268	-	-
HCM Lane V/C Ratio	0.027	-	0.042	-	-
HCM Control Delay (s)	13.2	-	19	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	38	2	0	13	49	1444	66	25	1405	26
Future Vol, veh/h	1	0	38	2	0	13	49	1444	66	25	1405	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	145
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	39	2	0	13	50	1473	67	26	1434	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2175	3126	717	2376	3120	770	1461	0	0	1540	0	0
Stage 1	1486	1486	-	1607	1607	-	-	-	-	-	-	-
Stage 2	689	1640	-	769	1513	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	36	11	372	26	11	295	458	-	-	213	-	-
Stage 1	128	186	-	75	163	-	-	-	-	-	-	-
Stage 2	376	157	-	350	181	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	9	372	19	9	295	458	-	-	213	-	-
Mov Cap-2 Maneuver	29	9	-	19	9	-	-	-	-	-	-	-
Stage 1	114	163	-	67	145	-	-	-	-	-	-	-
Stage 2	320	140	-	275	159	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	47.4	0.4	0.4
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	458	-	-	285	100	213	-	-
HCM Lane V/C Ratio	0.109	-	-	0.14	0.153	0.12	-	-
HCM Control Delay (s)	13.8	-	-	19.7	47.4	24.2	-	-
HCM Lane LOS	B	-	-	C	E	C	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.5	0.4	-	-


```
ExPM                    Thu Apr 26, 2018 17:36:09                   Page 3-1
---------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                            Existing Conditions
                               PM Peak Hour
---------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
***************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
***************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.640
Loss Time (sec):        5               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         32               Level Of Service:                 B
***************************************************************************
Street Name:           Fairview Street              West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1367   432  155 1290     1    1    3     4  453    2   184
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   10 1367   432  155 1290     1    1    3     4  453    2   184
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    10 1367   432  155 1290     1    1    3     4  453    2   184
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   10 1367   432  155 1290     1    1    3     4  453    2   184
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   10 1367   432  155 1290     1    1    3     4  453    2   184
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700  1700
Adjustment:  0.94 1.00  1.00 0.94 1.00  1.00 1.00 1.00  0.94 0.97 1.00  0.94
Lanes:       1.00 2.28  0.72 1.00 2.99  0.01 0.25 0.75  1.00 1.99 0.01  1.00
Final Sat.:  1598 3875  1225 1598 5096     4  425 1275  1598 3283   15  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.35  0.35 0.10 0.25  0.25 0.00 0.00  0.00 0.14 0.13  0.12
Crit Moves:       ****      ****                        **** ****
***************************************************************************
```

```
2021 NP AM                 Thu Apr 26, 2018 17:16:30                 Page 2-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                          2021 No Project Conditions
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.853
Loss Time (sec):       5                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        66                Level Of Service:                  D
********************************************************************************
Street Name:          Fairview Street                  West 17th Street
Approach:       North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        2  0  2  0  1   2  0  2  0  1   1  0  3  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     179  953  250   548 1203  126   218 1080  248   205  432  240
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  179  953  250   548 1203  126   218 1080  248   205  432  240
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   179  953  250   548 1203  126   218 1080  248   205  432  240
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  179  953  250   548 1203  126   218 1080  248   205  432  240
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  179  953  250   548 1203  126   218 1080  248   205  432  240
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700
Adjustment:  0.88 1.00 0.94  0.88 1.00 0.94  0.94 1.00 0.94  0.94 1.00 0.94
Lanes:       2.00 2.00 1.00  2.00 2.00 1.00  1.00 3.00 1.00  1.00 2.00 1.00
Final Sat.:  2992 3400 1598  2992 3400 1598  1598 5100 1598  1598 3400 1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.28 0.16  0.18 0.35 0.08  0.14 0.21 0.16  0.13 0.13 0.15
Crit Moves:       ****       ****                  ****       ****
********************************************************************************
```


Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	103	1	1374	1658	1
Future Vol, veh/h	9	103	1	1374	1658	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	65
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	113	1	1510	1822	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2579	911	1823	0	-	0
Stage 1	1822	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	21	277	332	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	424	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	21	277	332	-	-	-
Mov Cap-2 Maneuver	104	-	-	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	424	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	332	-	244	-	-
HCM Lane V/C Ratio	0.003	-	0.504	-	-
HCM Control Delay (s)	15.9	-	33.9	-	-
HCM Lane LOS	C	-	D	-	-
HCM 95th %tile Q(veh)	0	-	2.6	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	14	6	1391	1735	2
Future Vol, veh/h	4	14	6	1391	1735	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	110
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	15	6	1449	1807	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2544	904	1809	0	-	0
Stage 1	1807	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	22	280	336	-	-	-
Stage 1	116	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	22	280	336	-	-	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	114	-	-	-	-	-
Stage 2	434	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	336	-	190	-	-
HCM Lane V/C Ratio	0.019	-	0.099	-	-
HCM Control Delay (s)	15.9	-	26	-	-
HCM Lane LOS	C	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	52	3	1	20	30	1379	34	61	1679	11
Future Vol, veh/h	6	3	52	3	1	20	30	1379	34	61	1679	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	145
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	3	53	3	1	20	31	1407	35	62	1713	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2462	3341	857	2469	3335	721	1724	0	0	1442	0	0
Stage 1	1837	1837	-	1487	1487	-	-	-	-	-	-	-
Stage 2	625	1504	-	982	1848	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	22	8	301	22	8	317	363	-	-	238	-	-
Stage 1	77	125	-	92	186	-	-	-	-	-	-	-
Stage 2	412	183	-	261	123	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	13	5	301	7	5	317	363	-	-	238	-	-
Mov Cap-2 Maneuver	13	5	-	7	5	-	-	-	-	-	-	-
Stage 1	70	92	-	84	170	-	-	-	-	-	-	-
Stage 2	350	167	-	154	91	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 353.1	232.5	0.3	0.9
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	363	-	-	49	35	238	-	-
HCM Lane V/C Ratio	0.084	-	-	1.27	0.7	0.262	-	-
HCM Control Delay (s)	15.8	-	-	$ 353.1	232.5	25.4	-	-
HCM Lane LOS	C	-	-	F	F	D	-	-
HCM 95th %tile Q(veh)	0.3	-	-	5.7	2.4	1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

```
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2021 No Project Conditions
                               AM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.664
Loss Time (sec):       5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        34               Level Of Service:                  B
********************************************************************************
Street Name:         Fairview Street             West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  2  1  0    1  0  2  1  0    0  1  0  0  1    1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       8 1287   403  274 1453    12    5   18     7  271    6   156
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    8 1287   403  274 1453    12    5   18     7  271    6   156
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     8 1287   403  274 1453    12    5   18     7  271    6   156
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    8 1287   403  274 1453    12    5   18     7  271    6   156
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    8 1287   403  274 1453    12    5   18     7  271    6   156
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700  1700
Adjustment:  0.94 1.00  1.00 0.94 1.00  1.00 1.00 1.00  0.94 0.97 1.00  0.94
Lanes:       1.00 2.28  0.72 1.00 2.98  0.02 0.22 0.78  1.00 1.96 0.04  1.00
Final Sat.:  1598 3884  1216 1598 5058    42  370 1330  1598 3224   74  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.33  0.33 0.17 0.29  0.29 0.01 0.01  0.00 0.08 0.08  0.10
Crit Moves:       ****       ****                  ****                   ****
********************************************************************************
```



```
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2021 No Project Conditions
                               PM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.954
Loss Time (sec):       5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       135               Level Of Service:                  E
********************************************************************************
Street Name:         Fairview Street                  West 17th Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  2  0  1    2  0  2  0  1    1  0  3  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     291 1130   118  362 1058   146  268  804   227  196 1025   418
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  291 1130   118  362 1058   146  268  804   227  196 1025   418
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   291 1130   118  362 1058   146  268  804   227  196 1025   418
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  291 1130   118  362 1058   146  268  804   227  196 1025   418
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  291 1130   118  362 1058   146  268  804   227  196 1025   418
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700  1700
Adjustment:  0.88 1.00  0.94 0.88 1.00  0.94 0.94 1.00  0.94 0.94 1.00  1.00
Lanes:       2.00 2.00  1.00 2.00 2.00  1.00 1.00 3.00  1.00 1.00 2.13  0.87
Final Sat.:  2992 3400  1598 2992 3400  1598 1598 5100  1598 1598 3623  1477
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.33  0.07 0.12 0.31  0.09 0.17 0.16  0.14 0.12 0.28  0.28
Crit Moves:       ****       ****            ****                   ****
********************************************************************************
```

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	21	9	1562	1582	11
Future Vol, veh/h	5	21	9	1562	1582	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	65
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	21	9	1578	1598	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2405	799	1609	0	-	0
Stage 1	1598	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	28	328	402	-	-	-
Stage 1	151	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	328	402	-	-	-
Mov Cap-2 Maneuver	132	-	-	-	-	-
Stage 1	148	-	-	-	-	-
Stage 2	399	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.7	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	402	-	255	-	-
HCM Lane V/C Ratio	0.023	-	0.103	-	-
HCM Control Delay (s)	14.2	-	20.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	9	12	1526	1484	8
Future Vol, veh/h	2	9	12	1526	1484	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	110
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	12	1557	1514	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2317	757	1522	0	-	0
Stage 1	1514	-	-	-	-	-
Stage 2	803	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	32	350	434	-	-	-
Stage 1	168	-	-	-	-	-
Stage 2	401	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	31	350	434	-	-	-
Mov Cap-2 Maneuver	116	-	-	-	-	-
Stage 1	163	-	-	-	-	-
Stage 2	401	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.7	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	434	-	256	-	-
HCM Lane V/C Ratio	0.028	-	0.044	-	-
HCM Control Delay (s)	13.5	-	19.7	-	-
HCM Lane LOS	B	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	38	2	0	13	49	1494	66	25	1450	26
Future Vol, veh/h	1	0	38	2	0	13	49	1494	66	25	1450	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	145
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	39	2	0	13	50	1524	67	26	1480	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2242	3223	740	2450	3217	796	1507	0	0	1591	0	0
Stage 1	1532	1532	-	1658	1658	-	-	-	-	-	-	-
Stage 2	710	1691	-	792	1559	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	32	9	359	23	10	283	440	-	-	201	-	-
Stage 1	120	177	-	69	153	-	-	-	-	-	-	-
Stage 2	365	148	-	339	172	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	25	7	359	17	8	283	440	-	-	201	-	-
Mov Cap-2 Maneuver	25	7	-	17	8	-	-	-	-	-	-	-
Stage 1	106	154	-	61	136	-	-	-	-	-	-	-
Stage 2	308	131	-	263	150	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.8	51.8	0.4	0.4
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	440	-	-	267	92	201	-	-
HCM Lane V/C Ratio	0.114	-	-	0.149	0.166	0.127	-	-
HCM Control Delay (s)	14.2	-	-	20.8	51.8	25.5	-	-
HCM Lane LOS	B	-	-	C	F	D	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.6	0.4	-	-


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--------------------------------------------------------------------------------
        North Fairview Bridge Widening Improvement Project (WKE1702)
                         2021 No Project Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
       ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):          0.651
Loss Time (sec):       5                Average Delay (sec/veh):       xxxxxx
Optimal Cycle:        33                Level Of Service:                   B
********************************************************************************
Street Name:          Fairview Street               West Civic Center Drive
Approach:      North Bound      South Bound      East Bound      West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected       Split Phase      Split Phase
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:         4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        1  0  2  1  0    1  0  2  1  0    0  1  0  0  1    1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1394   430  157 1332     1    1     3     4  469     2   193
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   10 1394   430  157 1332     1    1     3     4  469     2   193
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    10 1394   430  157 1332     1    1     3     4  469     2   193
Reduct Vol:     0    0     0    0    0     0    0     0     0    0     0     0
Reduced Vol:   10 1394   430  157 1332     1    1     3     4  469     2   193
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   10 1394   430  157 1332     1    1     3     4  469     2   193
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700  1700
Adjustment:  0.94 1.00  1.00 0.94 1.00  1.00 1.00 1.00  0.94 0.97 1.00  0.94
Lanes:       1.00 2.29  0.71 1.00 2.99  0.01 0.25 0.75  1.00 1.99 0.01  1.00
Final Sat.:  1598 3898  1202 1598 5096     4  425 1275  1598 3284   14  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.36  0.36 0.10 0.26  0.26 0.00 0.00  0.00 0.14 0.14  0.12
Crit Moves:       ****       ****                       ****  ****
********************************************************************************
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2021 WP AM                 Thu Apr 26, 2018 17:24:58                 Page 2-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2021 With Project Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.860
Loss Time (sec):        5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         68               Level Of Service:                  D
********************************************************************************
Street Name:          Fairview Street                  West 17th Street
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  2  0  1    2  0  2  0  1    1  0  3  0  1    1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     185  975   259   533 1238   120   211 1081   258   213  431   234
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  185  975   259   533 1238   120   211 1081   258   213  431   234
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   185  975   259   533 1238   120   211 1081   258   213  431   234
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  185  975   259   533 1238   120   211 1081   258   213  431   234
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  185  975   259   533 1238   120   211 1081   258   213  431   234
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.88 1.00  0.94  0.88 1.00  0.94  0.94 1.00  0.94  0.94 1.00  0.94
Lanes:       2.00 2.00  1.00  2.00 2.00  1.00  1.00 3.00  1.00  1.00 2.00  1.00
Final Sat.:  2992 3400  1598  2992 3400  1598  1598 5100  1598  1598 3400  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.29  0.16  0.18 0.36  0.08  0.13 0.21  0.16  0.13 0.13  0.15
Crit Moves:       ****        ****                   ****        ****
********************************************************************************
```


Intersection						
Int Delay, s/veh	2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	103	7	1411	1711	1
Future Vol, veh/h	9	103	7	1411	1711	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	113	8	1551	1880	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2517	941	1881	0	-	0
Stage 1	1881	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	49	227	144	-	-	-
Stage 1	68	-	-	-	-	-
Stage 2	446	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	46	227	144	-	-	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	64	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	55.7	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	144	-	186	-	-
HCM Lane V/C Ratio	0.053	-	0.662	-	-
HCM Control Delay (s)	31.4	-	55.7	-	-
HCM Lane LOS	D	-	F	-	-
HCM 95th %tile Q(veh)	0.2	-	3.9	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	18	0	1438	1788	8
Future Vol, veh/h	0	18	0	1438	1788	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	19	0	1498	1863	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	936	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	229	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	229	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	229	-	-
HCM Lane V/C Ratio	-	0.082	-	-
HCM Control Delay (s)	-	22.1	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.3	-	-

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	52	3	1	20	30	1420	34	61	1736	11
Future Vol, veh/h	6	3	52	3	1	20	30	1420	34	61	1736	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	3	53	3	1	20	31	1449	35	62	1771	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2543	3447	891	2363	3435	742	1782	0	0	1484	0	0
Stage 1	1901	1901	-	1529	1529	-	-	-	-	-	-	-
Stage 2	642	1546	-	834	1906	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	29	7	245	38	7	307	161	-	-	227	-	-
Stage 1	45	116	-	84	178	-	-	-	-	-	-	-
Stage 2	391	174	-	298	115	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	15	4	245	8	4	307	161	-	-	227	-	-
Mov Cap-2 Maneuver	15	4	-	8	4	-	-	-	-	-	-	-
Stage 1	36	84	-	68	144	-	-	-	-	-	-	-
Stage 2	293	140	-	164	84	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 410.5	232.5	0.7	0.9
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	161	-	-	45	35	227	-	-
HCM Lane V/C Ratio	0.19	-	-	1.383	0.7	0.274	-	-
HCM Control Delay (s)	32.5	-	-	$ 410.5	232.5	26.7	-	-
HCM Lane LOS	D	-	-	F	F	D	-	-
HCM 95th %tile Q(veh)	0.7	-	-	6	2.4	1.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

```
-------------------------------------------------------------------------------
        North Fairview Bridge Widening Improvement Project (WKE1702)
                      2021 With Project Conditions
                              AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.691
Loss Time (sec):        5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         36               Level Of Service:                  B
*******************************************************************************
Street Name:          Fairview Street            West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      13 1313   391   304 1479    12     5   18     7   261    6   165
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13 1313   391   304 1479    12     5   18     7   261    6   165
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    13 1313   391   304 1479    12     5   18     7   261    6   165
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   13 1313   391   304 1479    12     5   18     7   261    6   165
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   13 1313   391   304 1479    12     5   18     7   261    6   165
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.94 1.00  1.00  0.94 1.00  1.00  1.00 1.00  0.94  0.97 1.00  0.94
Lanes:       1.00 2.31  0.69  1.00 2.98  0.02  0.22 0.78  1.00  1.96 0.04  1.00
Final Sat.:  1598 3930  1170  1598 5059    41   370 1330  1598  3222   76  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.33  0.33  0.19 0.29  0.29  0.01 0.01  0.00  0.08 0.08  0.10
Crit Moves:       ****        ****                   ****                   ****
*******************************************************************************
```



```
-------------------------------------------------------------------------------
        North Fairview Bridge Widening Improvement Project (WKE1702)
                      2021 With Project Conditions
                              PM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.948
Loss Time (sec):        5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        127               Level Of Service:                  E
*******************************************************************************
Street Name:          Fairview Street                West 17th Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        2  0  2  0  1   2  0  2  0  1   1  0  3  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     303 1161   124   355 1075   139   253  805   233   204 1020   405
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  303 1161   124   355 1075   139   253  805   233   204 1020   405
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   303 1161   124   355 1075   139   253  805   233   204 1020   405
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  303 1161   124   355 1075   139   253  805   233   204 1020   405
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  303 1161   124   355 1075   139   253  805   233   204 1020   405
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.88 1.00  0.94  0.88 1.00  0.94  0.94 1.00  0.94  0.94 1.00  1.00
Lanes:       2.00 2.00  1.00  2.00 2.00  1.00  1.00 3.00  1.00  1.00 2.15  0.85
Final Sat.:  2992 3400  1598  2992 3400  1598  1598 5100  1598  1598 3651  1449
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10 0.34  0.08  0.12 0.32  0.09  0.16 0.16  0.15  0.13 0.28  0.28
Crit Moves:       ****        ****            ****                   ****
*******************************************************************************
```

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	21	21	1611	1613	11
Future Vol, veh/h	5	21	21	1611	1613	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	-
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	21	21	1627	1629	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2328	820	1640	0	-	0
Stage 1	1635	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	3.12	-	-	-
Pot Cap-1 Maneuver	62	273	190	-	-	-
Stage 1	97	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	55	273	190	-	-	-
Mov Cap-2 Maneuver	81	-	-	-	-	-
Stage 1	86	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.2	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	190	-	188	-	-
HCM Lane V/C Ratio	0.112	-	0.14	-	-
HCM Control Delay (s)	26.3	-	27.2	-	-
HCM Lane LOS	D	-	D	-	-
HCM 95th %tile Q(veh)	0.4	-	0.5	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	0	1589	1515	20
Future Vol, veh/h	0	11	0	1589	1515	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	0	1621	1546	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	783	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	289	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	289	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	289	-	-
HCM Lane V/C Ratio	-	0.039	-	-
HCM Control Delay (s)	-	18	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	38	2	0	13	49	1545	66	25	1483	26
Future Vol, veh/h	1	0	38	2	0	13	49	1545	66	25	1483	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	39	2	0	13	50	1577	67	26	1513	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2310	3323	770	2368	3303	822	1540	0	0	1644	0	0
Stage 1	1579	1579	-	1711	1711	-	-	-	-	-	-	-
Stage 2	731	1744	-	657	1592	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	41	8	295	37	8	272	213	-	-	189	-	-
Stage 1	78	168	-	62	144	-	-	-	-	-	-	-
Stage 2	345	139	-	383	165	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	29	5	295	24	5	272	213	-	-	189	-	-
Mov Cap-2 Maneuver	29	5	-	24	5	-	-	-	-	-	-	-
Stage 1	60	145	-	47	110	-	-	-	-	-	-	-
Stage 2	251	106	-	287	142	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23	41.4	0.8	0.4
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	213	-	-	239	114	189	-	-
HCM Lane V/C Ratio	0.235	-	-	0.167	0.134	0.135	-	-
HCM Control Delay (s)	27	-	-	23	41.4	27	-	-
HCM Lane LOS	D	-	-	C	E	D	-	-
HCM 95th %tile Q(veh)	0.9	-	-	0.6	0.4	0.5	-	-


```
-------------------------------------------------------------------------------
          North Fairview Bridge Widening Improvement Project (WKE1702)
                         2021 With Project Conditions
                                 PM Peak Hour
-------------------------------------------------------------------------------

                       Level Of Service Computation Report
         ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.665
Loss Time (sec):        5                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         34                Level Of Service:                  B
*******************************************************************************
Street Name:             Fairview Street               West Civic Center Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:       L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Protected        Protected       Split Phase      Split Phase
Rights:            Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:          1  0  2  1  0    1  0  2  1  0    0  1  0  0  1    1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1445   417   172 1347     1     1    3     4   458    2   220
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10 1445   417   172 1347     1     1    3     4   458    2   220
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10 1445   417   172 1347     1     1    3     4   458    2   220
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   10 1445   417   172 1347     1     1    3     4   458    2   220
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   10 1445   417   172 1347     1     1    3     4   458    2   220
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.94 1.00  1.00  0.94 1.00  1.00  1.00 1.00  0.94  0.97 1.00  0.94
Lanes:       1.00 2.33  0.67  1.00 2.99  0.01  0.25 0.75  1.00  1.99 0.01  1.00
Final Sat.:  1598 3958  1142  1598 5096     4   425 1275  1598  3283   15  1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.37  0.37  0.11 0.26  0.26  0.00 0.00  0.00  0.14 0.14  0.14
Crit Moves:       ****        ****                          ****  ****
*******************************************************************************
```

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2040 NP AM                 Thu Apr 26, 2018 17:36:35                Page 2-1
-------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                         2040 No Project Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
*******************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):         1.071
Loss Time (sec):       5                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180                 Level Of Service:                  F
*******************************************************************************
Street Name:           Fairview Street                 West 17th Street
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  2  0  1    2  0  2  0  1    1  0  3  0  1    1  0  2  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:     154 1230   187   755 1517   195   330  968   202   145  387   321
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  154 1230   187   755 1517   195   330  968   202   145  387   321
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   154 1230   187   755 1517   195   330  968   202   145  387   321
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  154 1230   187   755 1517   195   330  968   202   145  387   321
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  154 1230   187   755 1517   195   330  968   202   145  387   321
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.88 1.00  0.94  0.88 1.00  0.94  0.94 1.00  0.94  0.94 1.00  0.94
Lanes:       2.00 2.00  1.00  2.00 2.00  1.00  1.00 3.00  1.00  1.00 2.00  1.00
Final Sat.:  2992 3400  1598  2992 3400  1598  1598 5100  1598  1598 3400  1598
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.36  0.12  0.25 0.45  0.12  0.21 0.19  0.13  0.09 0.11  0.20
Crit Moves:       ****        ****              ****                          ****
*******************************************************************************
```


Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	103	1	1563	1866	1
Future Vol, veh/h	9	103	1	1563	1866	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	65
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	113	1	1718	2051	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2912	1026	2052	0	-	0
Stage 1	2051	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	12	232	270	-	-	-
Stage 1	85	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	12	232	270	-	-	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	85	-	-	-	-	-
Stage 2	374	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	48.1	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	270	-	200	-	-
HCM Lane V/C Ratio	0.004	-	0.615	-	-
HCM Control Delay (s)	18.4	-	48.1	-	-
HCM Lane LOS	C	-	E	-	-
HCM 95th %tile Q(veh)	0	-	3.5	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	14	6	1580	1943	2
Future Vol, veh/h	4	14	6	1580	1943	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	110
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	15	6	1646	2024	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2859	1012	2026	0	-	0
Stage 1	2024	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	13	237	276	-	-	-
Stage 1	88	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	13	237	276	-	-	-
Mov Cap-2 Maneuver	67	-	-	-	-	-
Stage 1	86	-	-	-	-	-
Stage 2	386	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	276	-	152	-	-
HCM Lane V/C Ratio	0.023	-	0.123	-	-
HCM Control Delay (s)	18.3	-	32	-	-
HCM Lane LOS	C	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	19.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	52	3	1	20	30	1568	34	61	1887	11
Future Vol, veh/h	6	3	52	3	1	20	30	1568	34	61	1887	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	145
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	3	53	3	1	20	31	1600	35	62	1926	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2753	3747	963	2769	3741	818	1937	0	0	1635	0	0
Stage 1	2050	2050	-	1680	1680	-	-	-	-	-	-	-
Stage 2	703	1697	-	1089	2061	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	14	4	256	14	4	274	300	-	-	191	-	-
Stage 1	56	97	-	67	150	-	-	-	-	-	-	-
Stage 2	368	147	-	225	96	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 6	~ 2	256	-	2	274	300	-	-	191	-	-
Mov Cap-2 Maneuver	~ 6	~ 2	-	-	2	-	-	-	-	-	-	-
Stage 1	50	65	-	60	135	-	-	-	-	-	-	-
Stage 2	303	132	-	115	65	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 1126.8		0.3	1
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	300	-	-	23	-	191	-	-
HCM Lane V/C Ratio	0.102	-	-	2.706	-	0.326	-	-
HCM Control Delay (s)	18.4	-	$ 1126.8		-	32.7	-	-
HCM Lane LOS	C	-	-	F	-	D	-	-
HCM 95th %tile Q(veh)	0.3	-	-	7.9	-	1.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

```
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                         2040 No Project Conditions
                                AM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.766
Loss Time (sec):       5              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        46              Level Of Service:                  C
********************************************************************************
Street Name:          Fairview Street             West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       8 1449  383   357 1541   12     5   18    7   229    6  192
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    8 1449  383   357 1541   12     5   18    7   229    6  192
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:     8 1449  383   357 1541   12     5   18    7   229    6  192
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    8 1449  383   357 1541   12     5   18    7   229    6  192
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:    8 1449  383   357 1541   12     5   18    7   229    6  192
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700
Adjustment:  0.94 1.00 1.00  0.94 1.00 1.00  1.00 1.00 0.94  0.97 1.00 0.94
Lanes:       1.00 2.37 0.63  1.00 2.98 0.02  0.22 0.78 1.00  1.95 0.05 1.00
Final Sat.:  1598 4034 1066  1598 5061   39   370 1330 1598  3211   87 1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.36 0.36  0.22 0.30 0.30  0.01 0.01 0.00  0.07 0.07 0.12
Crit Moves:       ****       ****                  ****                  ****
********************************************************************************
```



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--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                         2040 No Project Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         1.258
Loss Time (sec):       5              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180              Level Of Service:                  F
********************************************************************************
Street Name:          Fairview Street                West 17th Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        2  0  2  0  1   2  0  2  0  1   1  0  3  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     254 1437   83   480 1355  233   422  721  196   145  975  577
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  254 1437   83   480 1355  233   422  721  196   145  975  577
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Volume:   254 1437   83   480 1355  233   422  721  196   145  975  577
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  254 1437   83   480 1355  233   422  721  196   145  975  577
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  254 1437   83   480 1355  233   422  721  196   145  975  577
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700 1700  1700 1700 1700  1700 1700 1700  1700 1700 1700
Adjustment:  0.88 1.00 0.94  0.88 1.00 0.94  0.94 1.00 0.94  0.94 1.00 0.94
Lanes:       2.00 2.00 1.00  2.00 2.00 1.00  1.00 3.00 1.00  1.00 2.00 1.00
Final Sat.:  2992 3400 1598  2992 3400 1598  1598 5100 1598  1598 3400 1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.42 0.05  0.16 0.40 0.15  0.26 0.14 0.12  0.09 0.29 0.36
Crit Moves:       ****       ****            ****                        ****
********************************************************************************
```

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	21	9	1797	1797	11
Future Vol, veh/h	5	21	9	1797	1797	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	50	-	-	65
Veh in Median Storage, #	2	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	99	99	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	21	9	1815	1815	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2741	908	1826	0	-	0
Stage 1	1815	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	16	278	331	-	-	-
Stage 1	115	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	16	278	331	-	-	-
Mov Cap-2 Maneuver	100	-	-	-	-	-
Stage 1	112	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.9	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	331	-	207	-	-
HCM Lane V/C Ratio	0.027	-	0.127	-	-
HCM Control Delay (s)	16.2	-	24.9	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	9	12	1761	1699	8
Future Vol, veh/h	2	9	12	1761	1699	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	25	-	-	110
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	12	1797	1734	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2657	867	1742	0	-	0
Stage 1	1734	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	18	296	357	-	-	-
Stage 1	127	-	-	-	-	-
Stage 2	347	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	17	296	357	-	-	-
Mov Cap-2 Maneuver	88	-	-	-	-	-
Stage 1	123	-	-	-	-	-
Stage 2	347	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.4	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	357	-	207	-	-
HCM Lane V/C Ratio	0.034	-	0.054	-	-
HCM Control Delay (s)	15.4	-	23.4	-	-
HCM Lane LOS	C	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

HCM 6th TWSC North Fairview Bridge Widening Improvement Project (WKE1702)
4: N Fairview Street & W 9th Street 01/26/2018

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	38	2	0	13	49	1729	66	25	1665	26
Future Vol, veh/h	1	0	38	2	0	13	49	1729	66	25	1665	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	145
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	39	2	0	13	50	1764	67	26	1699	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2557	3682	850	2800	3676	916	1726	0	0	1831	0	0
Stage 1	1751	1751	-	1898	1898	-	-	-	-	-	-	-
Stage 2	806	1931	-	902	1778	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	6.94	6.99	6.54	7.14	4.14	-	-	5.34	-	-
Critical Hdwy Stg 1	6.54	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.32	3.67	4.02	3.92	2.22	-	-	3.12	-	-
Pot Cap-1 Maneuver	19	5	304	13	5	236	362	-	-	152	-	-
Stage 1	87	138	-	46	116	-	-	-	-	-	-	-
Stage 2	318	112	-	291	134	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	14	4	304	9	4	236	362	-	-	152	-	-
Mov Cap-2 Maneuver	14	4	-	9	4	-	-	-	-	-	-	-
Stage 1	75	114	-	40	100	-	-	-	-	-	-	-
Stage 2	259	97	-	210	111	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.6	96.2	0.4	0.5
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	362	-	-	199	54	152	-	-
HCM Lane V/C Ratio	0.138	-	-	0.2	0.283	0.168	-	-
HCM Control Delay (s)	16.5	-	-	27.6	96.2	33.4	-	-
HCM Lane LOS	C	-	-	D	F	D	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.7	1	0.6	-	-


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2040 NP PM                  Thu Apr 26, 2018 17:37:00                 Page 3-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2040 No Project Conditions
                               PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.705
Loss Time (sec):        5                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         38                Level Of Service:                  C
********************************************************************************
Street Name:          Fairview Street              West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include         Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1524  418  169 1533    1    1    3    4  545    2  233
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   10 1524  418  169 1533    1    1    3    4  545    2  233
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    10 1524  418  169 1533    1    1    3    4  545    2  233
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   10 1524  418  169 1533    1    1    3    4  545    2  233
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:   10 1524  418  169 1533    1    1    3    4  545    2  233
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700
Adjustment:  0.94 1.00 1.00 0.94 1.00 1.00 1.00 1.00 0.94 0.97 1.00 0.94
Lanes:       1.00 2.35 0.65 1.00 2.99 0.01 0.25 0.75 1.00 1.99 0.01 1.00
Final Sat.:  1598 4002 1098 1598 5097    3  425 1275 1598 3286   12 1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.38 0.38 0.11 0.30 0.30 0.00 0.00 0.00 0.17 0.16 0.15
Crit Moves:       ****      ****                          **** ****
********************************************************************************
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2040 WP AM                  Thu Apr 26, 2018 17:37:34                 Page 2-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                          2040 With Project Conditions
                                  AM Peak Hour
--------------------------------------------------------------------------------

                       Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         1.031
Loss Time (sec):       5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180               Level Of Service:                  F
********************************************************************************
Street Name:           Fairview Street                 West 17th Street
Approach:        North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:         4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:         2  0  2  0  1    2  0  2  0  1    1  0  3  0  1    1  0  2  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:    188  1357   238  665  1716   165  287   969   260  191   382   287
Growth Adj: 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse: 188  1357   238  665  1716   165  287   969   260  191   382   287
User Adj:   1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Volume:  188  1357   238  665  1716   165  287   969   260  191   382   287
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol: 188  1357   238  665  1716   165  287   969   260  191   382   287
PCE Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume: 188  1357   238  665  1716   165  287   969   260  191   382   287
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:   1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700  1700
Adjustment: 0.88  1.00  0.94 0.88  1.00  0.94 0.94  1.00  0.94 0.94  1.00  0.94
Lanes:      2.00  2.00  1.00 2.00  2.00  1.00 1.00  3.00  1.00 1.00  2.00  1.00
Final Sat.: 2992  3400  1598 2992  3400  1598 1598  5100  1598 1598  3400  1598
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:    0.06  0.40  0.15 0.22  0.50  0.10 0.18  0.19  0.16 0.12  0.11  0.18
Crit Moves:       ****       ****             ****                            ****
********************************************************************************
```


Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	9	103	6	1	1775	2169	1
Future Vol, veh/h	9	103	6	1	1775	2169	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	-	50	-	-	-
Veh in Median Storage, #	2	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	91	91	92	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	10	113	7	1	1951	2384	1

Major/Minor	Minor2		Major1			Major2	
Conflicting Flow All	3181	1193	1741	2385	0	-	0
Stage 1	2385	-	-	-	-	-	-
Stage 2	796	-	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.64	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	2.32	3.12	-	-	-
Pot Cap-1 Maneuver	21	154	169	79	-	-	-
Stage 1	32	-	-	-	-	-	-
Stage 2	367	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	18	154	58	58	-	-	-
Mov Cap-2 Maneuver	26	-	-	-	-	-	-
Stage 1	28	-	-	-	-	-	-
Stage 2	367	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	195.6	0.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	58	-	110	-	-
HCM Lane V/C Ratio	0.131	-	1.119	-	-
HCM Control Delay (s)	75.6	-	195.6	-	-
HCM Lane LOS	F	-	F	-	-
HCM 95th %tile Q(veh)	0.4	-	7.7	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	18	0	1802	2246	8
Future Vol, veh/h	0	18	0	1802	2246	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	19	0	1877	2340	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1174	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	159	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	159	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.6	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	159	-	-
HCM Lane V/C Ratio	-	0.118	-	-
HCM Control Delay (s)	-	30.6	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	52	3	1	20	30	1784	34	61	2194	11
Future Vol, veh/h	6	3	52	3	1	20	30	1784	34	61	2194	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	3	53	3	1	20	31	1820	35	62	2239	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3160	4286	1125	2921	4274	928	2250	0	0	1855	0	0
Stage 1	2369	2369	-	1900	1900	-	-	-	-	-	-	-
Stage 2	791	1917	-	1021	2374	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	11	~ 2	171	16	2	232	93	-	-	148	-	-
Stage 1	21	67	-	46	116	-	-	-	-	-	-	-
Stage 2	317	114	-	228	66	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	~ 1	171	-	~ 1	232	93	-	-	148	-	-
Mov Cap-2 Maneuver	-	~ 1	-	-	~ 1	-	-	-	-	-	-	-
Stage 1	14	39	-	31	77	-	-	-	-	-	-	-
Stage 2	190	76	-	84	38	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			1	1.2
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	93	-	-	-	-	148	-	-
HCM Lane V/C Ratio	0.329	-	-	-	-	0.421	-	-
HCM Control Delay (s)	61.6	-	-	-	-	45.9	-	-
HCM Lane LOS	F	-	-	-	-	E	-	-
HCM 95th %tile Q(veh)	1.3	-	-	-	-	1.9	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

```
-------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2040 With Project Conditions
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.908
Loss Time (sec):        5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         92               Level Of Service:                  E
*******************************************************************************
Street Name:          Fairview Street            West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Y+R:         4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:       1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      13 1600  315  507 1690   12    5   18    7  168    6  243
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   13 1600  315  507 1690   12    5   18    7  168    6  243
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:    13 1600  315  507 1690   12    5   18    7  168    6  243
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   13 1600  315  507 1690   12    5   18    7  168    6  243
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:   13 1600  315  507 1690   12    5   18    7  168    6  243
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700
Adjustment:  0.94 1.00 1.00 0.94 1.00 1.00 1.00 1.00 0.94 0.97 1.00 0.94
Lanes:       1.00 2.51 0.49 1.00 2.98 0.02 0.22 0.78 1.00 1.93 0.07 1.00
Final Sat.:  1598 4261  839 1598 5064   36  370 1330 1598 3181  117 1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.38 0.38 0.32 0.33 0.33 0.01 0.01 0.00 0.05 0.05 0.15
Crit Moves:       ****      ****                ****                     ****
*******************************************************************************
```



```
-------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2040 With Project Conditions
                                PM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
*******************************************************************************
Intersection #1 Fairview Street (NS) / West 17th Street (EW)
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         1.195
Loss Time (sec):        5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180               Level Of Service:                  F
*******************************************************************************
Street Name:          Fairview Street                West 17th Street
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Y+R:         4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:       2  0  2  0  1   2  0  2  0  1   1  0  3  0  1   1  0  2  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     322 1618  118  438 1449  190  336  727  231  187  950  499
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  322 1618  118  438 1449  190  336  727  231  187  950  499
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   322 1618  118  438 1449  190  336  727  231  187  950  499
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  322 1618  118  438 1449  190  336  727  231  187  950  499
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:  322 1618  118  438 1449  190  336  727  231  187  950  499
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700
Adjustment:  0.88 1.00 0.94 0.88 1.00 0.94 0.94 1.00 0.94 0.94 1.00 0.94
Lanes:       2.00 2.00 1.00 2.00 2.00 1.00 1.00 3.00 1.00 1.00 2.00 1.00
Final Sat.:  2992 3400 1598 2992 3400 1598 1598 5100 1598 1598 3400 1598
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.48 0.07 0.15 0.43 0.12 0.21 0.14 0.14 0.12 0.28 0.31
Crit Moves:       ****      ****           ****                          ****
*******************************************************************************
```

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	5	21	12	9	2081	1968	11
Future Vol, veh/h	5	21	12	9	2081	1968	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	-	50	-	-	-
Veh in Median Storage, #	2	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	99	99	92	99	99	99	99
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	5	21	13	9	2102	1988	11

Major/Minor	Minor2		Major1			Major2	
Conflicting Flow All	2879	1000	1459	1999	0	-	0
Stage 1	1994	-	-	-	-	-	-
Stage 2	885	-	-	-	-	-	-
Critical Hdwy	5.74	7.14	5.64	5.34	-	-	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-	-
Follow-up Hdwy	3.82	3.92	2.32	3.12	-	-	-
Pot Cap-1 Maneuver	31	207	243	125	-	-	-
Stage 1	57	-	-	-	-	-	-
Stage 2	329	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	27	207	167	167	-	-	-
Mov Cap-2 Maneuver	46	-	-	-	-	-	-
Stage 1	49	-	-	-	-	-	-
Stage 2	329	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.7	0.3	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	167	-	124	-	-
HCM Lane V/C Ratio	0.133	-	0.212	-	-
HCM Control Delay (s)	29.8	-	41.7	-	-
HCM Lane LOS	D	-	E	-	-
HCM 95th %tile Q(veh)	0.4	-	0.8	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	11	0	2059	1870	20
Future Vol, veh/h	0	11	0	2059	1870	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	11	0	2101	1908	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	964	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	219	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	219	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	22.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	219	-	-
HCM Lane V/C Ratio	-	0.051	-	-
HCM Control Delay (s)	-	22.3	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	38	2	0	13	49	2015	66	25	1838	26
Future Vol, veh/h	1	0	38	2	0	13	49	2015	66	25	1838	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	55	-	-	95	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	98	98	98	98	98	98	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	39	2	0	13	50	2056	67	26	1876	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2864	4165	952	2992	4145	1062	1903	0	0	2123	0	0
Stage 1	1942	1942	-	2190	2190	-	-	-	-	-	-	-
Stage 2	922	2223	-	802	1955	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	18	2	223	15	2	189	140	-	-	108	-	-
Stage 1	42	110	-	28	82	-	-	-	-	-	-	-
Stage 2	263	79	-	312	109	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	10	1	223	7	1	189	140	-	-	108	-	-
Mov Cap-2 Maneuver	10	1	-	7	1	-	-	-	-	-	-	-
Stage 1	27	83	-	18	53	-	-	-	-	-	-	-
Stage 2	157	51	-	196	83	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	39.3	133.5	1	0.6
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	140	-	-	144	42	108	-	-
HCM Lane V/C Ratio	0.357	-	-	0.276	0.364	0.236	-	-
HCM Control Delay (s)	44.4	-	-	39.3	133.5	48.4	-	-
HCM Lane LOS	E	-	-	E	F	E	-	-
HCM 95th %tile Q(veh)	1.5	-	-	1.1	1.3	0.9	-	-


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2040 WP PM                  Thu Apr 26, 2018 17:46:52                 Page 3-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                        2040 With Project Conditions
                                PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.876
Loss Time (sec):        5                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         75                Level Of Service:                  D
********************************************************************************
Street Name:          Fairview Street              West Civic Center Drive
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:         1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  1  0  0  1
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      10 1817   343   246 1619     1     1    3     4   482    2   393
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10 1817   343   246 1619     1     1    3     4   482    2   393
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10 1817   343   246 1619     1     1    3     4   482    2   393
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   10 1817   343   246 1619     1     1    3     4   482    2   393
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   10 1817   343   246 1619     1     1    3     4   482    2   393
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.94 1.00  1.00  0.94 1.00  1.00  1.00 1.00  0.94  0.97 1.00  0.94
Lanes:       1.00 2.52  0.48  1.00 2.99  0.01  0.25 0.75  1.00  1.99 0.01  1.00
Final Sat.:  1598 4290   810  1598 5097     3   425 1275  1598  3284   14  1598
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.42  0.42  0.15 0.32  0.32  0.00 0.00  0.00  0.15 0.14  0.25
Crit Moves:       ****        ****                          ****              ****
********************************************************************************
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2040 WP AM WIMP           Wed Jun 6, 2018 14:09:30               Page 2-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                2040 With Project Conditions WITH IMPROVEMENTS
                                AM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.842
Loss Time (sec):       5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        63               Level Of Service:                  D
********************************************************************************
Street Name:         Fairview Street            West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      13 1600   315   507 1690    12     5   18     7   168    6   243
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   13 1600   315   507 1690    12     5   18     7   168    6   243
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    13 1600   315   507 1690    12     5   18     7   168    6   243
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   13 1600   315   507 1690    12     5   18     7   168    6   243
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   13 1600   315   507 1690    12     5   18     7   168    6   243
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.94 1.00  1.00  0.94 1.00  1.00  1.00 1.00  0.94  0.95 1.00  0.97
Lanes:       1.00 2.51  0.49  1.00 2.98  0.02  0.22 0.78  1.00  1.21 0.04  1.75
Final Sat.:  1598 4261   839  1598 5064    36   370 1330  1598  1953   73  2870
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.38  0.38  0.32 0.33  0.33  0.01 0.01  0.00  0.09 0.08  0.08
Crit Moves:       ****        ****                   ****        ****
********************************************************************************
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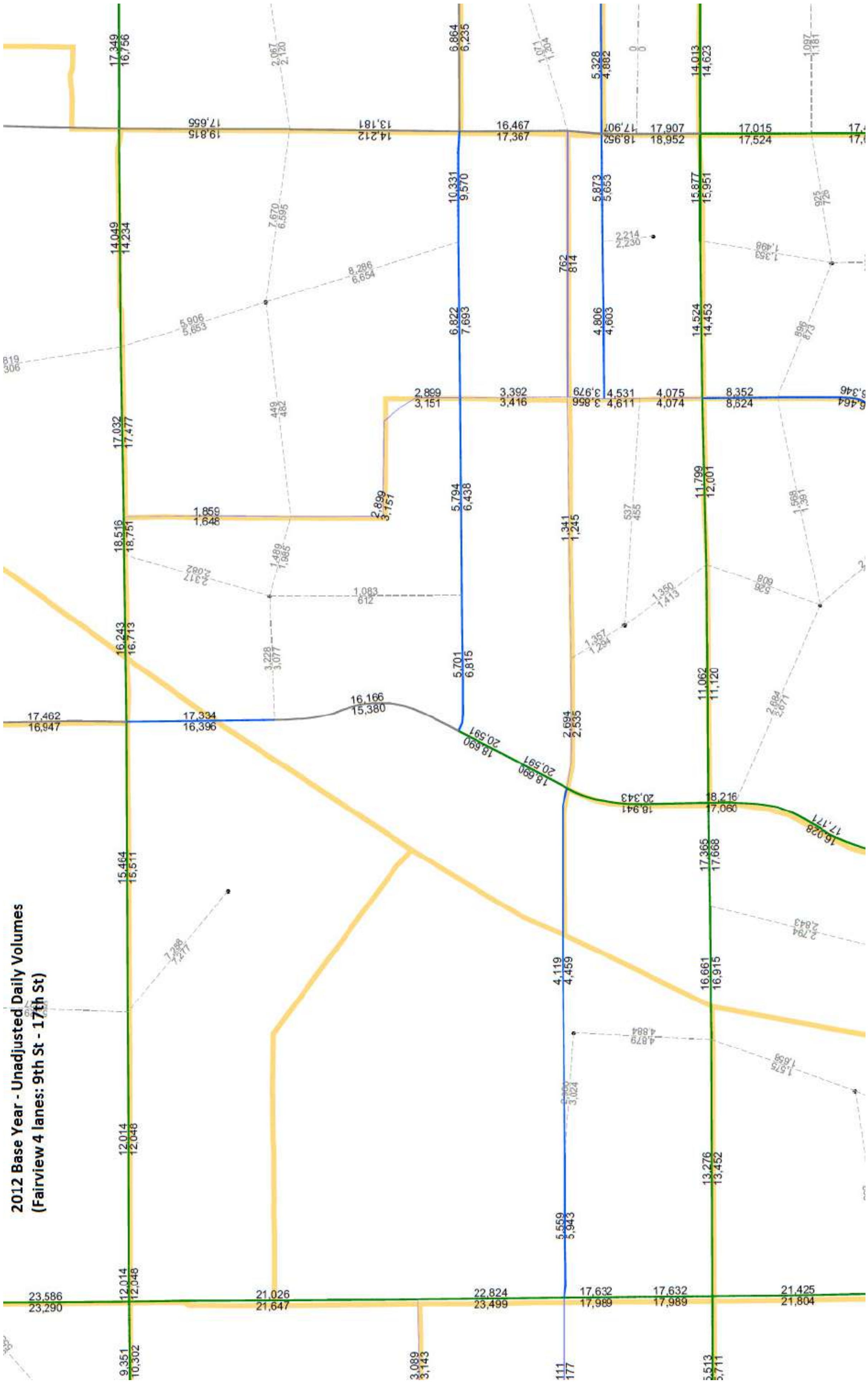
2040 WP PM WIMP           Wed Jun 6, 2018 14:10:15               Page 2-1
--------------------------------------------------------------------------------
         North Fairview Bridge Widening Improvement Project (WKE1702)
                2040 With Project Conditions WITH IMPROVEMENTS
                                PM Peak Hour
--------------------------------------------------------------------------------

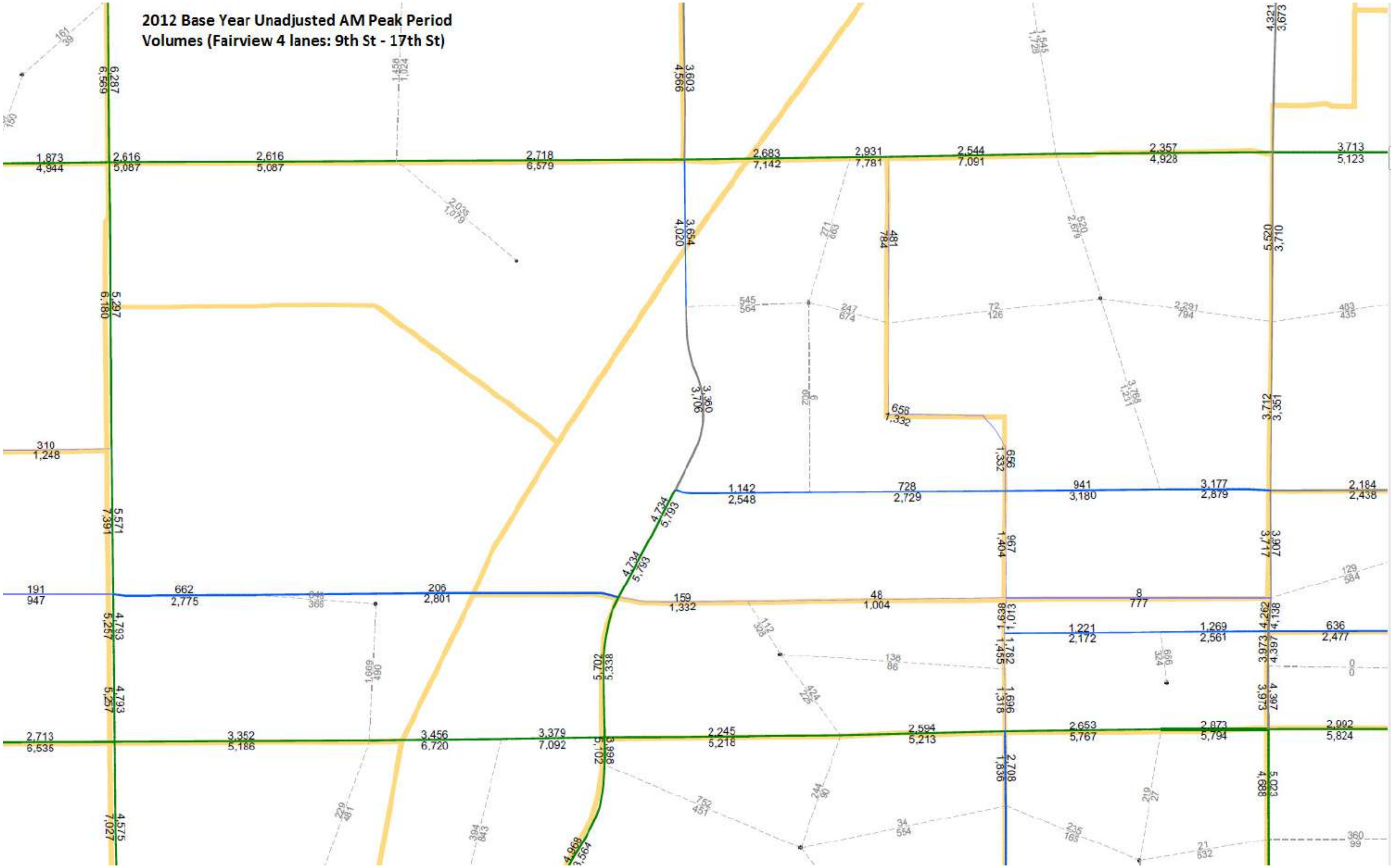
                      Level Of Service Computation Report
        ICU 1(Loss as Cycle Length %) Method (Base Volume Alternative)
********************************************************************************
Intersection #5 Fairview Street (NS) / West Civic Center Drive (EW)
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.810
Loss Time (sec):       5               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        54               Level Of Service:                  D
********************************************************************************
Street Name:         Fairview Street            West Civic Center Drive
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  2  1  0   1  0  2  1  0   0  1  0  0  1   1  0  1! 0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10 1817   343   246 1619     1     1    3     4   482    2   393
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   10 1817   343   246 1619     1     1    3     4   482    2   393
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    10 1817   343   246 1619     1     1    3     4   482    2   393
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   10 1817   343   246 1619     1     1    3     4   482    2   393
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   10 1817   343   246 1619     1     1    3     4   482    2   393
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1700 1700  1700  1700 1700  1700  1700 1700  1700  1700 1700  1700
Adjustment:  0.94 1.00  1.00  0.94 1.00  1.00  1.00 1.00  0.94  0.96 1.00  0.96
Lanes:       1.00 2.52  0.48  1.00 2.99  0.01  0.25 0.75  1.00  1.65 0.01  1.34
Final Sat.:  1598 4290   810  1598 5097     3   425 1275  1598  2701   12  2183
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.42  0.42  0.15 0.32  0.32  0.00 0.00  0.00  0.18 0.17  0.18
Crit Moves:       ****        ****                         ****              ****
********************************************************************************
```

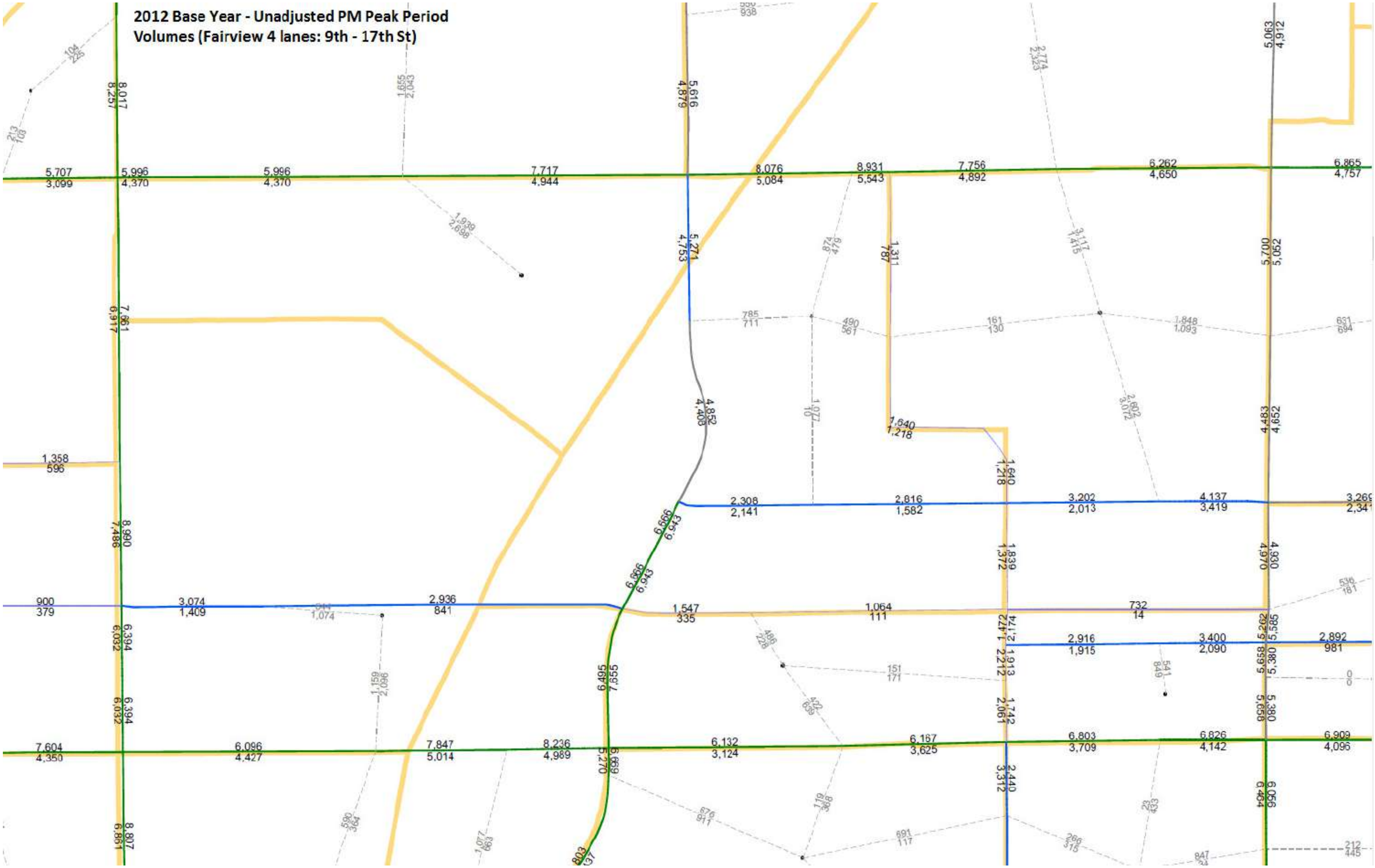
APPENDIX C

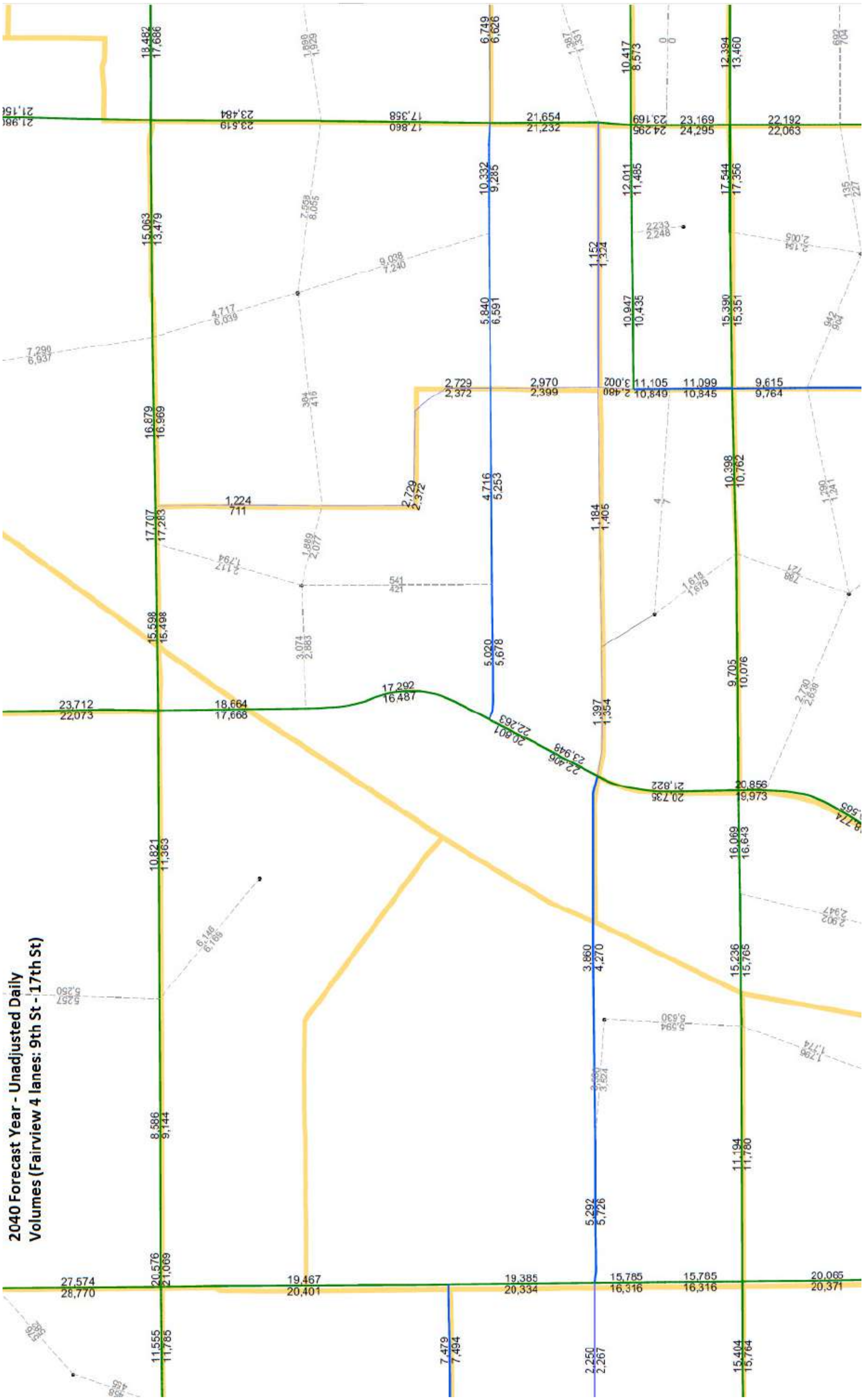
OCTAM FORECAST PLOTS



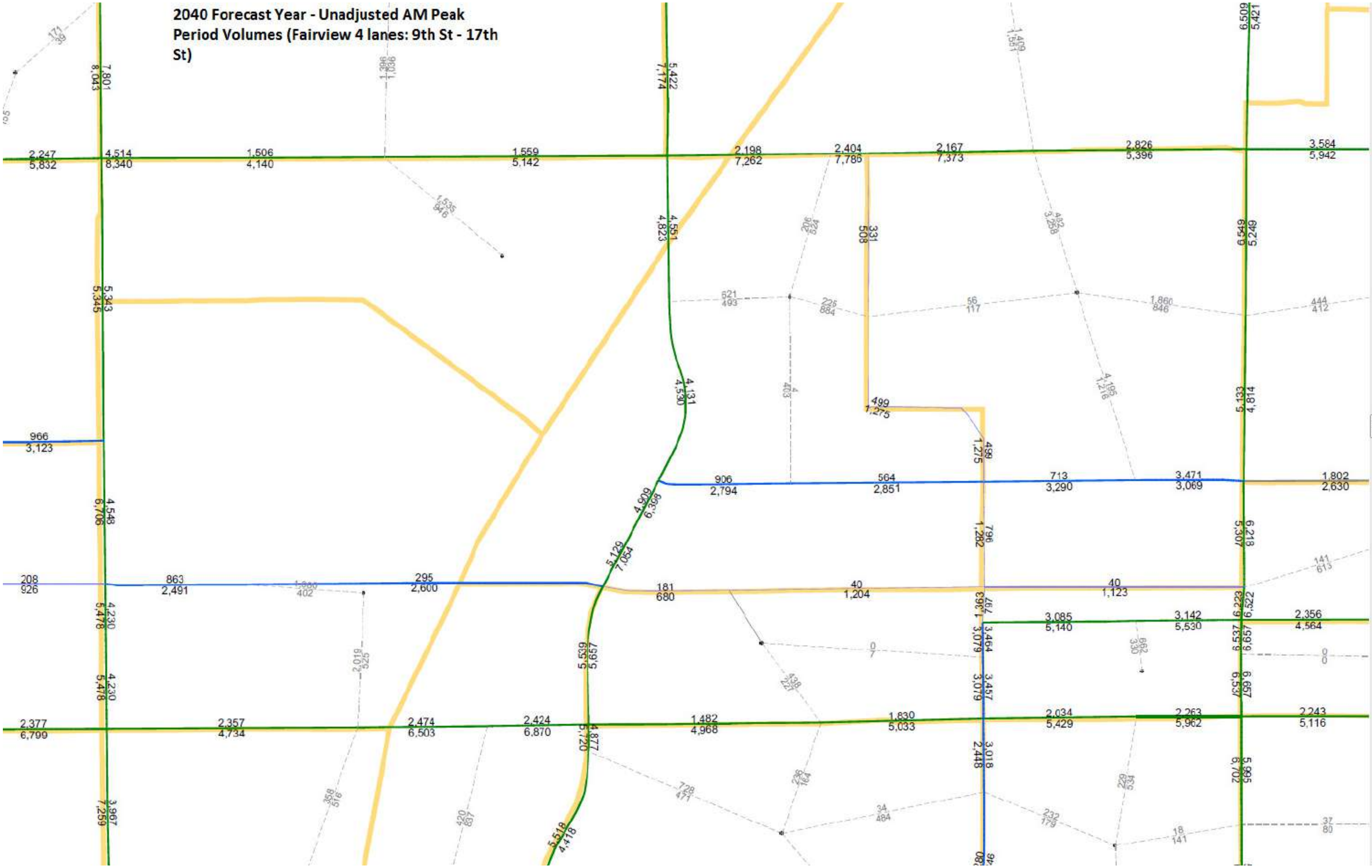
2012 Base Year - Unadjusted Daily Volumes
(Fairview 4 lanes: 9th St - 17th St)


2012 Base Year Unadjusted AM Peak Period
Volumes (Fairview 4 lanes: 9th St - 17th St)

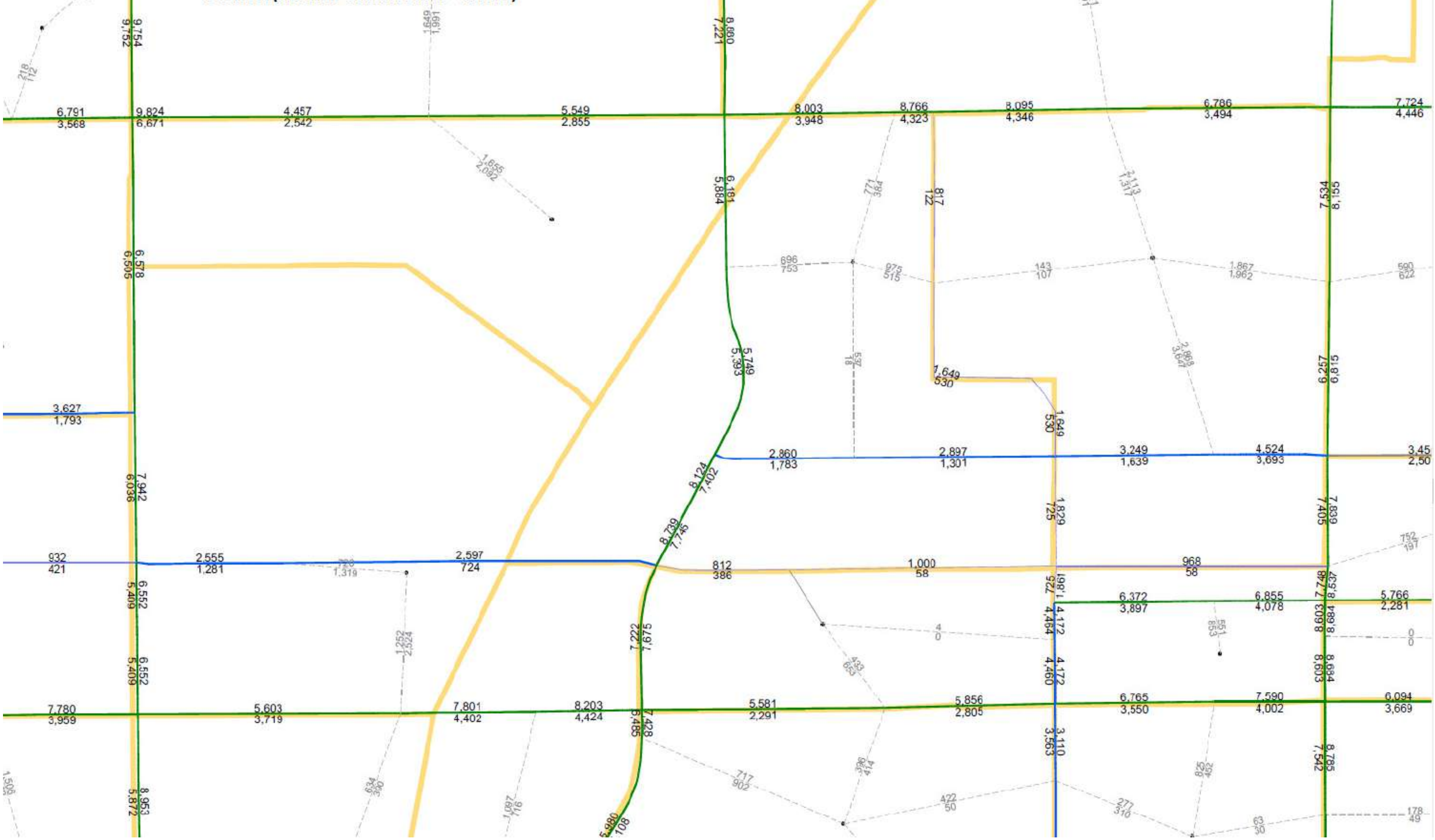

2012 Base Year - Unadjusted PM Peak Period
Volumes (Fairview 4 lanes: 9th - 17th St)


2040 Forecast Year - Unadjusted Daily
Volumes (Fairview 4 lanes: 9th St - 17th St)

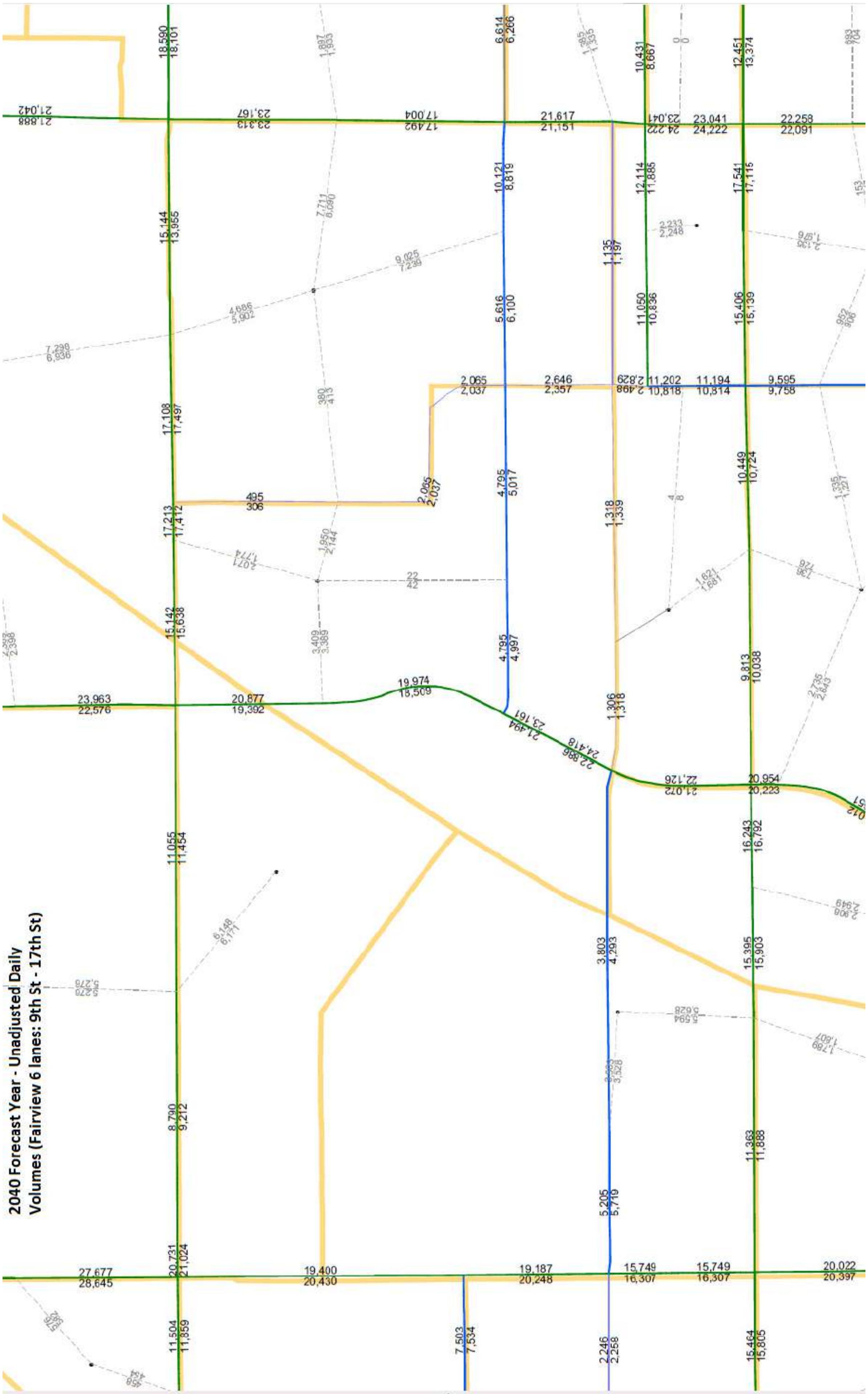
2040 Forecast Year - Unadjusted AM Peak Period Volumes (Fairview 4 lanes: 9th St - 17th St)



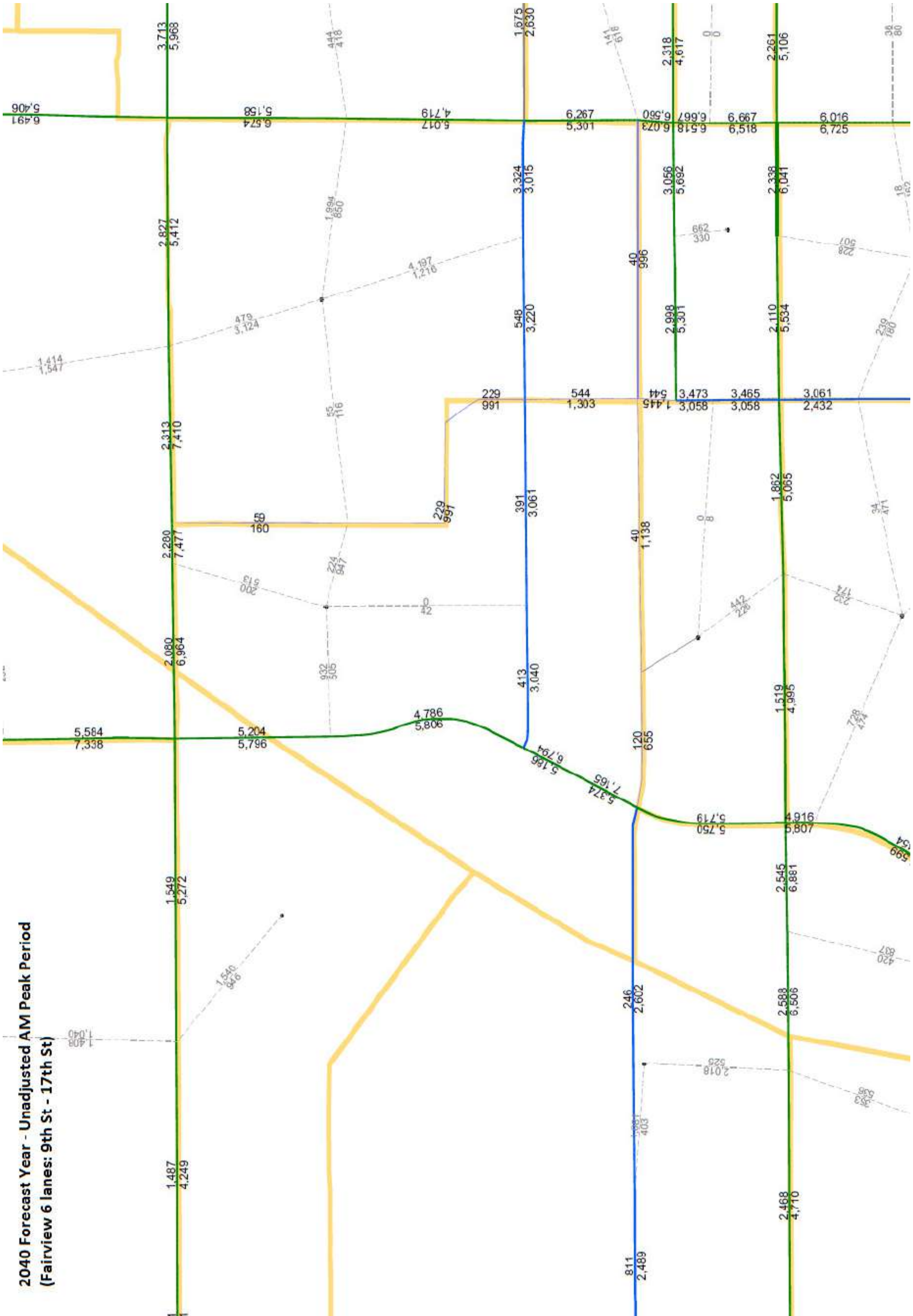
2040 Forecast Year - Unadjusted PM Peak Period Volumes (Fairview 4 lanes: 9th St - 17th St)



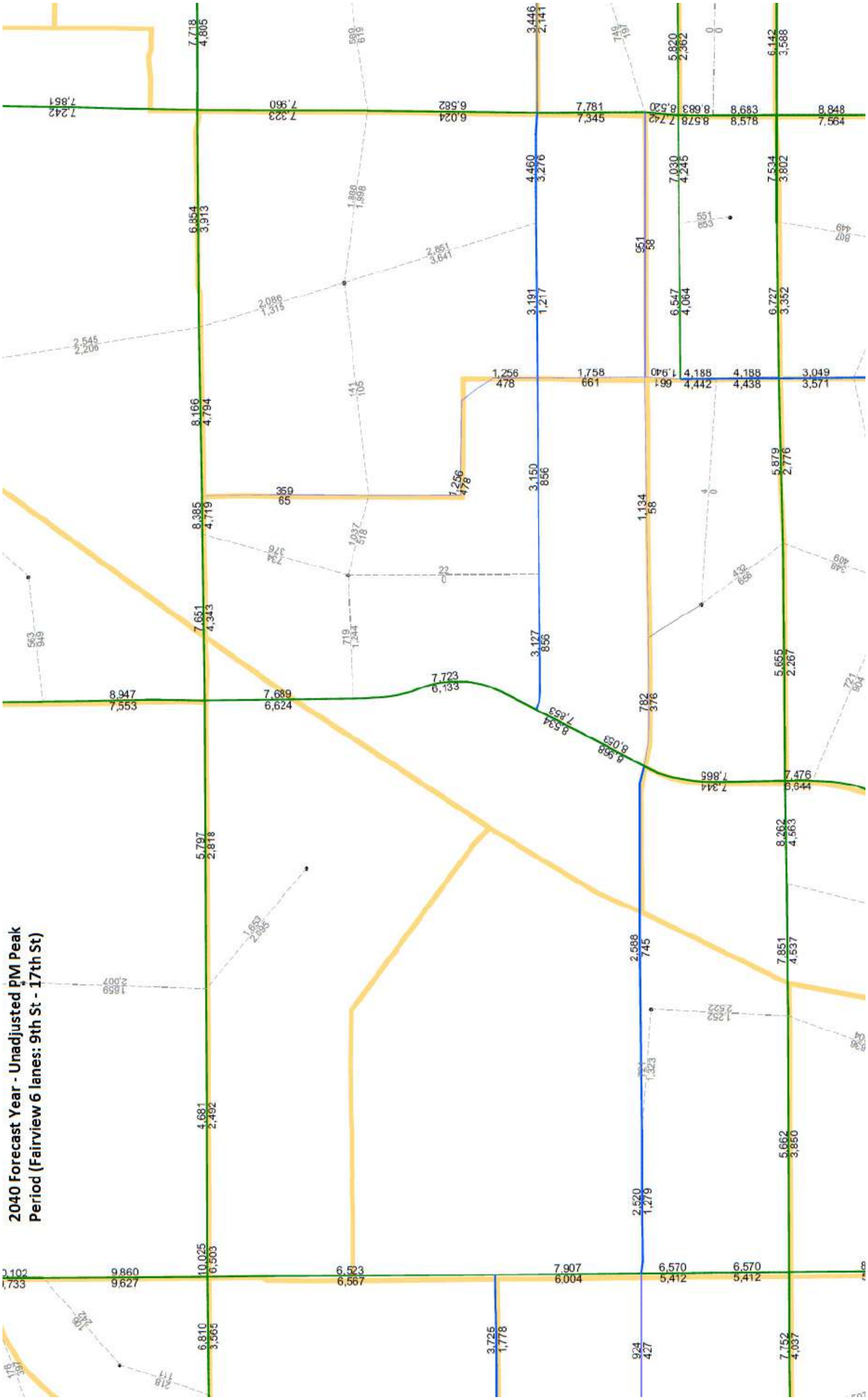
2040 Forecast Year - Unadjusted Daily Volumes (Fairview 6 lanes: 9th St - 17th St)



2040 Forecast Year - Unadjusted AM Peak Period
(Fairview 6 lanes: 9th St - 17th St)



2040 Forecast Year - Unadjusted PM Peak Period (Fairview 6 lanes: 9th St - 17th St)



APPENDIX A

Appendix A Historic Property Survey Report

MEMORANDUM

DATE: September 16, 2019

TO: Brian Liu, Associate Environmental Planner, California Department of Transportation, District 12

FROM: Nicole West, Associate Environmental Planner, LSA

SUBJECT: Water Quality Memorandum: Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project BRLS 5063(184)

1.0 PROJECT DESCRIPTION

The City of Santa Ana, in conjunction with Caltrans District 12, proposes to widen Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge crossing over the Santa Ana River (proposed Project) in Santa Ana, California. The purpose of the Project is to reduce congestion and improve pedestrian and bicyclist safety on Fairview Street between 9th Street and 16th Street, consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element.

South of 9th Street, Fairview Street provides three lanes in each direction which are reduced to two lanes in each direction north of 9th Street, across the existing four-lane bridge, to 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. In addition, there are no sidewalks, bikeways, or lighting on the existing bridge. Pedestrians and bicyclists currently use the roadway shoulder to cross the bridge.

The Santa Ana River Trail (SART) runs on both sides of the Santa Ana River in the Project area. The SART is a Section 4(f) Resource and would be temporarily closed during construction of the proposed Project.

The proposed Project includes widening Fairview Street between 9th Street and 16th Street, including replacing the Fairview Street bridge over the Santa Ana River. The proposed Project would widen Fairview Street from two lanes in each direction to three lanes in each direction in the City of Santa Ana (refer to Figures 1 and 2; all figures are provided in Attachment A). Fairview Street bridge would be replaced with a new six-lane bridge (three lanes in each direction), including a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.

The proposed bridge would be expanded from approximately 52 feet (ft) to 100 ft in width, and would have the same roadway profile as the existing bridge. The eight pier walls that support the existing bridge would be removed, and four new pier walls would be constructed to support the new bridge.

The proposed Project would acquire partial right-of-way take from three parcels (two commercial parcels [Assessor's Parcel Numbers (APN) 405-213-02 and 405-213-01] and one single-family residence [APN 405-213-14]) as shown in Figure 2.

An existing 12-inch water line and a bank of 12 phone conduits cross the Santa Ana River, suspended under the deck of the existing bridge. These utilities would be temporarily relocated during construction and then permanently relocated to the new bridge.

Water quality best management practices (BMPs) would be included to treat stormwater runoff such as a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area.

Fairview Street would remain open during the construction period with two southbound lanes and one northbound lane, with lanes shifted to one side of the bridge while the other side is replaced. Therefore, no detours would be required for vehicles traveling along Fairview Street. Access to properties would be maintained.

During construction, pedestrians and bicyclists would be detoured away from the Fairview Street bridge to the 17th Street bridge to cross the Santa Ana River by way of the SART between the hours of 9:00 a.m. and 7:00 p.m., when the gates to the SART are open and unlocked. After hours, pedestrians and bicyclists wishing to cross the Santa Ana River would be detoured to adjacent City streets such as King Street.

Construction of the proposed Project would require temporary closures of a portion of the SART for the demolition and placement of the bridge superstructure. The SART includes a Class I bike path on the eastern side and a regional riding and hiking trail on the western side. The portion of SART affected by Project construction would need to be temporarily closed four times for approximately 8 hours each time during two summer periods for the placement of precast concrete girders. During these periods, SART users would be detoured and signage would be provided to display the dates of the closures and to identify the detour routes. Work on the north and south sides of the bridge would be completed during separate periods so that SART users can be detoured to the trail on the opposite side of the Santa Ana River at 5th Street (refer to Figures 3A and 3B for the detour plans). There are gates and ramps located on both sides of the SART at 5th Street that provide access to bicyclists and pedestrians for these detours. Details regarding the detour are being coordinated with Orange County (OC) Parks. Other short-term closures of up to 15 minutes would be allowed with flagmen.

A temporary detour within the river bed may be required as a contingency. This would involve construction of dirt and gravel ramps with asphalt topping to and from the SART and the river bed as shown on Figure 2.

Construction vehicles would access the Santa Ana River from the gate and ramp at the County of Orange access road at the northwest corner of the bridge, and would use the existing concrete access ramp into the river approximately 250 ft west of the Project area (Figure 2). All access roads to the SART that are utilized by construction vehicles or for detour routes would be reconstructed and restored to pre-construction conditions or better prior to Project completion.

2.0 REGULATORY SETTING

2.1 Federal Law and 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 unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. Known today as the

Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the NPDES permit program. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity, which 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. The Federal Environmental Protection Agency delegated to the California State Water Resources Control Board (SWRCB) the implementation and administration of the NPDES program in California. The SWRCB established nine Regional Water Quality Control Boards (RWQCBs). The SWRCB enacts and enforces the Federal NPDES program and all water quality programs and regulations that cross Regional boundaries. The nine RWQCBs enact, administer and enforce all programs, including NPDES permitting, within their jurisdictional boundaries. Section 402(p) requires permits for discharges of stormwater 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 U.S, including wetlands. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The objective 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 Individual. There are two types of General permits: Regional 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 authorize a variety of minor project activities with no more than minimal effects.

There are also two types of Individual permits: Standard Individual permit and Letter of Permission. Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE’s Individual permits. For Standard Individual permit, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency’s (EPA) Section 404 (b)(1) Guidelines (U.S. EPA CFR 40 Part 230), and whether permit approval is in the public interest. The 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with 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 USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA), to the proposed discharge that would have less effects on waters of the U.S., and not have any other significant adverse environmental consequences. Per Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures have been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause “significant degradation” to waters of the U.S. In addition, every permit from the USACE, even if not subject to the 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4.

2.2 State Laws and 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 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 as required by the CWA, and regulating discharges to protect beneficial uses of water bodies. Details regarding water quality standards in a Project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set standards necessary to protect these uses. Consequently, the water quality standards developed for particular water body segments are based on the designated use and vary depending on such use. Water body segments that fail to meet standards for specific pollutants are included in a Statewide List in accordance with CWA Section 303(d). If a Regional Board determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-source point controls (NPDES permits or Waste Discharge Requirements), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

The SWRCB implemented the requirements of CWA Section 303(d) through Attachment IV of the Caltrans Statewide MS4, as it includes specific TMDLs for which Caltrans is the named stakeholder.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB adjudicates 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 Pollution Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4). Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of stormwater dischargers, including MS4s. The U.S. EPA defines an MS4 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 stormwater, that are designed or used for collecting or conveying stormwater." The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Construction General Permit. Construction General Permit (NPDES No. CAS000002, SWRCB Order No. 2009-0009-DWQ, adopted on November 16, 2010) became effective on February 14, 2011 and was amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ. The permit regulates stormwater discharges from construction sites which 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.

For all projects subject to the Construction General Permit (CGP), the applicant is required to hire a Qualified Storm Water Pollution Prevention Plan (SWPPP) Developer (QSD) to develop and implement an effective SWPPP. All Project Registration Documents, including the SWPPP, are required to be uploaded into the SWRCB's on-line Stormwater Multiple Application and Report Tracking System (SMARTS), at least 30 days prior to construction.

Waivers from CGP Coverage

Projects that disturb over 1.0 acre but less than 5 acres of soil, may qualify for waiver of CGP coverage. This occurs whenever the R factor of the **Watershed Erosion Estimate (=RxKxLS) in tons/acre** is less than 5. Within this CGP formula, there is a factor related to when and where the construction will take place. This factor, the 'R' factor, may be low, medium or high. When the R factor is below the numeric value of 5, projects can be waived from coverage under the CGP.

Construction activity that results in soil disturbances of less than one acre is subject to this CGP 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 a SWPPP, to implement soil erosion and pollution prevention control measures, and to obtain coverage under the CGP.

The CGP contains a risk-based permitting approach by establishing three levels of risk possible for a construction site. Risk levels are determined during the planning, design, and construction phases, and are based on project risk of generating sediments and receiving water risk of becoming impaired. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory stormwater runoff pH and turbidity monitoring, and pre- and post-construction aquatic biological assessments during specified seasonal windows.

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 of the United States must obtain a 401 Certification, which certifies that the project will be in compliance with State water quality standards. The most common federal permit triggering 401 Certification is a CWA Section 404 permit, issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before 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 prescribe a set of requirements known as Waste Discharge Requirements (WDRs) under the State Water Code (Porter-Cologne Act). WDRs may specify the inclusion of additional project 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.

2.3 Regional and Local Requirements

Santa Ana Regional Water Quality Control Board

The SWRCB carries out its water quality protection authority through the adoption of Water Quality Control Plans (Basin Plans). These plans establish water quality standards for particular bodies of water.

California water quality standards are composed of three parts: the designation of beneficial uses of water, water quality objectives to protect those uses, and implementation programs designed to achieve and maintain compliance with water quality objectives. The RWQCB, Santa Ana Region, is responsible for the Basin Plan for the Santa Ana River Basin, where the proposed project is. The RWQCB implements management plans to modify and adopt standards under provisions set forth in Section 303(c) of the CWA and the California Water Code (Division 7, Section 13240).

The SWRCB adopted the Policy for Implementation of Toxics Standards for Inland Surface Water, Enclosed Bays, and Estuaries of California in 2000. This policy provides implementation measures for criteria contained in the California Toxics Rule, promulgated in May 2000 by the EPA. When combined with the beneficial use designations in the Basin Plan, these documents establish statewide water quality standards for toxic constituents in surface water.

Basin Plan

The Basin Plan for the Santa Ana River Basin (RWQCB Region 8), most recently amended in February 2016, establishes water quality objectives for constituents that could potentially cause an adverse effect or impact on the beneficial uses of water. Specifically, Basin Plans are designed to accomplish the following.

1. Designate beneficial uses for surface and groundwater
2. Set the narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to California's anti-degradation policy
3. Describe implementation programs to protect the beneficial uses of all water in the region
4. Describe surveillance and monitoring activities to evaluate the effectiveness of the Basin plans

Basin Plans incorporate by reference all applicable SWRCB and RWQCB plans and policies. In addition to Basin Plan requirements, the RWQCB has water quality control authority under Section 401 of the CWA if a project needs to apply for a Nationwide Permit under Section 404 of the CWA.

Total Maximum Daily Load

TMDL refers to the amount of a specific pollutant a river, stream, or lake can assimilate and still meet federal water quality standards as provided in the CWA. TMDL accounts for all sources of pollution, including point sources, non-point sources, and natural background sources. Section 303(d) of the CWA (33 United State Code Section 1313[d]) requires that regulatory agencies determine TMDLs for all water bodies that do not meet water quality standards. The Section 303(d) list of impaired waterbodies provides a prioritization and schedule for development of TMDLs for the state.

The SWRCB, in compliance with the Section 303(d) of the CWA, prepared a 2014/2016 list of impaired water bodies in California. The SWRCB approved the 2014/2016 California Integrated Report (CWA Section 303(d) List/305(b) Report on October 3, 2017. On April 6, 2018, the EPA approved the 2014/2016 California 303(d) List of Water Quality Limited Segments. The 303(d) list includes a priority schedule for the development of TMDLs implementation for each contaminant impacting the waterbody.

Orange County National Pollutant Discharge Elimination System Permit

The proposed Project is subject to the requirements of the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit), Order R8-2009-0030, NPDES No. CAS618030, as amended by Order No. R8-2010-0062. The North Orange County MS4 Permit regulates discharges into the MS4 system in the cities and county areas within Orange County in the Santa Ana Region. As discussed further below, the North Orange County MS4 Permit requires preparation of a Water Quality Management Plan (WQMP) and implementation of postconstruction BMPs for new development and significant redevelopment projects that qualify as Priority Projects.

Drainage Area Management Program

The *Drainage Area Management Plan* (DAMP) was implemented and created by the County of Orange, the Orange County Flood Control District, and incorporated cities (permittees) and includes specific water pollutant requirements of the North Orange County Stormwater Program. The DAMP is the principle policy and guidance document for the NPDES program. It is the foundation for model programs, local implementation plans, and watershed implementation plans. Section 7 of the DAMP discusses issues relating to new developments and significant redevelopments.

Model Water Quality Management Plan

The *Model Water Quality Management Plan* (May 2011) was developed to aid Orange County, the Orange County Flood Control District, the cities in Orange County (permittees) and developers within Orange County to address postconstruction urban runoff and stormwater pollution from new development and significant redevelopment projects that qualify as Priority Projects. The proposed Project is categorized as street, road, highway, and freeway of 5,000 square feet or more of paved surface and, thus, is considered a Priority Project. The proposed Project will be required to comply with the North Orange County MS4 Permit Priority Project requirements.

Priority Projects are required to develop a Project WQMP to minimize adverse impacts of development to on-site hydrology, volume and rate of runoff, and pollutants of concern. The Project WQMP includes project-specific BMPs to minimize these effects (e.g., Low Impact Development [LID], site design measures, source control BMPs). The requirements identified in the Project WQMP are subject to DAMP Section 7.

According to the North Orange County MS4 Permit, all street and road construction project of 10,000 or more of street, road, highway, and freeway of 5,000 square feet or more of paved surface must also comply with the EPA guidance *Managing Wet Weather with Green Infrastructure Municipal Handbook: Green Streets* (December 2008 EPA-833-F-08-009) to the maximum extent practicable.

Technical Guidance Document

The County of Orange developed the *Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs)* (TGD) (County of Orange 2013) in cooperation with the incorporated cities of Orange County to aid agency staff and project proponents with addressing postconstruction urban runoff and stormwater pollution from new development and significant redevelopment projects in the county. The TGD serves as a technical guidance to complete the Project WQMP.

Orange County Construction Runoff Guidance Manual

The *Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers* (County of Orange 2012) presents the requirements related to construction from the DAMP. The goal of the Guidance Manual is to control pollutant discharges from construction sites. As such, it helps applicants for building and grading permits to understand the water quality requirements during the construction phase of development projects.

City of Sana Ana General Plan

The City of Santa Ana General Plan Conservation Element establishes the following policies and programs that relate to hydrology and water quality (City of Santa Ana 1982).

- Encourage water conservation through design and facilities features of new developments through the use of water quality wetlands, biofiltration swales, watershed-scale retrofits, etc. where such measures are likely to be effective and technically and economically feasible.
- Preserve vegetation along watercourse channels.
- Establish development guidelines for areas particularly susceptible to erosion and sediment loss.
- Provide for appropriate permanent measures to reduce stormwater pollutant loads in stormwater from the development site.
- Minimize changes in hydrology and pollutant loading; require incorporation of control, including structural and non-structural and Best Management Practices to mitigate the projected increases in pollutant loads and flows.
- Ensure that post-development runoff rates and velocities from a site have no significant adverse impact on downstream erosion and stream habitat.
- Maintain compliance with regional watershed and stormwater management principles.

City of Santa Ana Municipal Code

The City of Santa Ana Municipal Code (1969), Chapter 18, Article IV, Sections 151-161 regulate water pollution to improve water quality and comply with federal regulations relating to stormwater runoff. The code includes:

- Prohibition on illicit connections and discharges;
- Compliance with the Orange County DAMP and any other terms, conditions and requirements defined by the City of Santa Ana;
- Inspection of the project for compliance and the administrative remedies for noncompliance; and,
- Discussion of the permitting process.

General Waste Discharge Requirement Permit for Groundwater Discharges

The Santa Ana RWQCB requires a permit for discharging wastes to surface waters from activities involving groundwater extraction. The *General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality* (Order No. R8-2009-0003, NPDES No. CAG998001) (De Minimus Permit) covers discharges that pose a low potential to impact surface water quality within the Santa Ana Region. This Order would apply to the project if it could be demonstrated that the groundwater being discharged to surface waters does not contain pollutants of concern (selenium and nitrates). Under this permit, permittees are required to monitor their discharges from groundwater extraction waste from construction to ensure that effluent limitations for constituents are not exceeded.

3.0 AFFECTED ENVIRONMENT

3.1 Surface Waters

The Project area is within the Santa Ana River Watershed, which is within the jurisdiction of the Santa Ana RWQCB. The Santa Ana RWQCB jurisdiction is approximately 2,800 square miles in portions of Orange, Riverside, and San Bernardino counties and mostly consists of the 2,650-square-mile Santa Ana River Watershed. Specifically, the Project area is within the Lower Santa Ana River Watershed, which extends from Prado Dam to the Pacific Ocean.

For regulatory purposes, the Santa Ana RWQCB designates watershed areas in Hydrologic Units (HUs), which are further divided into Hydrologic Areas (HAs) and Hydrologic Subareas (HSAs). As designated by the Santa Ana RWQCB, the Project area is located within the Santa Ana River HU, the Lower Santa Ana River HA, and East Coast Plain HSA (Santa Ana RWQCB 1995).

The Santa Ana River extends approximately 96 miles from its headwaters to where it drains into the Pacific Ocean. The headwaters for the Santa Ana River and its tributaries originate in the San Gabriel, San Bernardino, and Santa Ana Mountains. From the San Bernardino and San Gabriel Mountains, the Santa Ana River flows through San Bernardino and Riverside Counties, then through the Prado Basin and a narrow pass in the Santa Ana Mountains. From the Santa Ana Mountains, the Santa Ana River flows southwesterly through Orange County to the Pacific Ocean. The Santa Ana River is divided into six reaches. The Fairview Street bridge crosses Reach 1 of the Santa Ana River, which defined as the portion of the river between the tidal prism and 17th Street in Santa Ana. The Santa Ana River within the Project area is a concrete-lined, trapezoidal channel and is devoid of vegetation (LSA 2018b). Intermittent flows within the Santa Ana River can be attributed to stormwater runoff, urban runoff, and treated wastewater (LSA 2018a).

Beneficial Uses of Surface Waters

Beneficial uses of water are defined in the Basin Plan as those necessary for the survival or well-being of humans, plants, and wildlife. Examples of those beneficial uses include drinking water supplies, swimming, industrial and agricultural water supply, and the support of freshwater and marine habitats and their organisms. The existing or potential beneficial uses for the Santa Ana River Reach 1, as identified in the Basin Plan, are:

- **REC-1:** Water Contact Recreation (access prohibited in all or part of the river per agency jurisdiction)
- **REC-2:** Non-Contact Water Recreation

The intermittent beneficial uses for the Santa Ana River Reach 1, as identified in the Basin Plan:

- **WARM:** Warm Freshwater Habitat
- **WILD:** Wildlife Habitat

Surface Water Quality Objectives

Surface water quality objectives establish the limits or levels of water quality constituents to protect beneficial uses. Table A lists surface water quality objectives for all inland surface waters from the Basin Plan that are applicable to Reach 1 of the Sana Ana River. No site-specific numeric water quality objectives were identified in the Basin Plan for Santa Ana River Reach 1, as this reach only contains flood flows.

Existing Water Quality

Reach 1 of the Santa Ana River is not listed as impaired for any constituents on the 2014/2016 303(d) List. In addition, there are no TMDLs applicable to Reach 1 of the Santa Ana River.

Areas of Special Biological Significance

Areas of Special Biological Significance (ASBS) are a subset of State water quality protection areas and require special protection as determined by the SWRCB pursuant to the California Ocean Plan. There are no ASBS, as defined by the SWRCB, within or downstream of the Project area (SWRCB 2019).

3.2 Floodplains

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) No. 0659C0144J (2009), the Santa Ana River within the Project area is designated Special Flood Hazard Area Zone A, areas subject to inundation by the 1 percent annual chance flood (100-year flood) with no base flood elevations determined. The remainder of the Project area (outside of the Santa Ana River) is designated as Other Areas of Flood Hazard Zone X, areas with reduced flood risk due to levee.

3.3 Groundwater Hydrology

The Project area is above the Coastal Plain of Orange County Groundwater Basin, which underlies the Lower Santa Ana River Watershed. The basin is bounded on the north by the Puente and Chino Hills, on the east by the Santa Ana Mountains, on the south by the San Joaquin Hills, on the southwest by the Pacific Ocean, and on the northwest by low topographic divide at approximately the Orange County-Los Angeles County line (DWR 2004).

For regulatory purposes, the Santa Ana RWQCB divides the Coastal Plain of Orange County Groundwater Basin into three Groundwater Management Zones. The Project area is within the Orange County Groundwater Management Zone (Santa Ana RWQCB 1995). The Orange County Groundwater Management Zone is bounded to the north by the Chino Hills, to the east by the Santa Ana Mountains, to the southeast by State Route 55, to the south by the Pacific Ocean, and to the northwest by the Orange County-Los Angeles County line.

Recharge to the Coastal Plain or to the Orange County Groundwater Basin occurs from percolation of Santa Ana River flow, infiltration of precipitation, and injection into wells (DWR 2004). A portion of the flow from the Santa Ana River directly below Prado Dam is diverted to recharge groundwater (RWQCB 2004).

Based on exploratory boreholes drilled in 2003 and 2004, groundwater levels are 25 to 30 feet below ground surface (Earth Mechanics, Inc. 2018).

Table A: Surface Water Quality Objectives for Inland Surface Waters

Constituent	Concentration
Algae	Waste discharges shall not contribute to excessive algal growth in inland surface receiving waters.
Ammonia, Un-ionized	Waters with WARM beneficial use designation: varies based on pH and temperature.
Boron	Shall not exceed 0.75 mg/L in inland surface waters of the region as a result of controllable water quality factors.
Chlorine (residual)	Chlorine residual in wastewater discharged to inland surface waters shall not exceed 0.1 mg/L.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses. The natural color of fish, shellfish or other inland surface water resources used for human consumption shall not be impaired.
Floatables	Waste discharges shall not contain floating materials, including solids, liquids, foam, or scum, that cause a nuisance or adversely affect beneficial uses.
Metals	Varies based on hardness.
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that result in a visible film or in coating objects in the water or which cause a nuisance or adversely affect beneficial uses.
Oxygen (dissolved)	Waters with WARM beneficial use designation: shall not be depressed below 5 mg/L as a result of controllable water quality factors.
	Waste discharges shall not cause the median dissolved oxygen concentration to fall below 85 percent of saturation or the 95th percentile concentration or fall below 75 percent of saturation within a 30-day period.
Pathogen indicator bacteria	Waters with REC-1 and REC-2 beneficial use designation: waste discharges shall not cause or contribute to excessive risk of illness from microorganisms pathogenic to human beings. Pathogen indicator concentrations shall not exceed a geometric mean of at least 5 samples in a 30-day period of 126 E. coli organism per 100 mL as a result of controllable water quality factors unless it is demonstrated to the Regional Board's satisfaction that the elevated indicator concentrations do not result in excessive risk of illness among people recreating in or near the water.
pH	Shall not be raised above 8.5 or depressed below 6.5 as a result of controllable water quality factors.
Solids (suspended and settleable)	Shall not cause nuisance or adversely affect beneficial uses as a result of water quality factors.
Sulfides	Shall not be increased as a result of controllable water quality factors.
Surfactants	Waste discharges shall not contain concentrations of surfactants that result in foam in the course of flow or use of the receiving water or that adversely affect aquatic life.
Taste and odor	Shall not contain taste- or odor-producing substances at concentrations that cause a nuisance or adversely affect beneficial uses. The natural taste and odor of fish, shellfish or other regional inland surface water resources used for human consumption shall not be impaired.
Temperature	Waters with WARM beneficial use designation: shall not be raised above 90°F June through October or above 78°F during the rest of the year as a result of controllable water quality factors.
Toxic substances	Shall not be discharged at levels that will bioaccumulate in aquatic resources to levels that are harmful to human health. The concentrations of contaminants in waters which are existing or potential sources of drinking water shall not occur at levels that are harmful to human health. Concentrations of toxic pollutants in the water column, sediments, or biota shall not adversely affect beneficial uses.
Turbidity	Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20 percent. Where natural turbidity is between 50 and 100 NTU, increases shall not exceed 10 NTU. Where natural turbidity is greater than 100 NTU, increases shall not exceed 10 percent.

Source: *Water Quality Control Plan for the Santa Ana River Basin* (Santa Ana RWQCB 1995; updated February 2016).

°F = degrees Fahrenheit
mg/L = milligrams per liter
mL = milliliter
N = nitrogen
NTU = nephelometric turbidity units
pCi/L = picocuries per liter
pH = percentage of hydrogen
RWQCB = Regional Water Quality Control Board
WARM = Warm Freshwater Habitat

Beneficial Uses for Groundwater Basins

The existing or potential beneficial uses identified in the Basin Plan for the Orange Groundwater Management Zone are:

- **MUN:** Municipal and Domestic Supply
- **AGR:** Agricultural Supply
- **IND:** Industrial Supply
- **PROC:** Process Water Supply

Water Quality Objectives for Groundwater Basins

Table B lists the groundwater quality objectives for all groundwater basins from the Basin Plan that are applicable to the Orange Groundwater Management Zone. The site-specific groundwater quality objectives for the Orange Groundwater Management Zone are:

- **Total Dissolved Solids:** 580 milligrams per liter (mg/L)
- **Nitrate as Nitrogen:** 3.4 mg/L

Existing Groundwater Quality

Water in the Orange Groundwater Management Zone is primarily sodium-calcium bicarbonate-based. Total dissolved solids range from 232 to 661 mg/L and average 475 mg/L. Near the coast, groundwater is impaired from seawater intrusion. Groundwater is impaired by salinity, nitrate, and methyl tert-butyl ether (MTBE) (DWR 2004).

4.0 POTENTIAL IMPACTS TO WATER QUALITY

4.1 Anticipated Changes to the Physical/Chemical Characteristics of the Aquatic Environment

Substrate

According to the *Draft Water Quality Management Plan (WQMP)* (Civil Works Engineers 2019b) prepared for the proposed Project, the Project would increase impervious area by approximately 8,500 square feet (approximately 0.2 acre), which would increase runoff to the Santa Ana River. Changes in runoff can affect substrate deposition in the downstream receiving waters. However, because the Santa Ana River is concrete-lined with no substrate, the proposed Project does not have the potential to affect substrate in downstream receiving waters.

Current, Circulation, or Drainage Patterns

Hydromodification is the alteration of the hydrologic characteristics of water bodies. Increased runoff from increases in impervious areas can alter the volume of water discharged to water bodies that can alter current and circulation patterns. However, the Santa Ana River is a stabilized concrete channel and is not susceptible to hydromodification[1] (County of Orange 2012).

[1] Hydromodification is the alteration of the hydrologic characteristics of water bodies. Increased stream flows and changes in sediment transport caused by increased impervious areas from urbanization or other land use changes can result in increased stream flows and changes in sediment transport.

Table B: Groundwater Quality Objectives for Groundwater Basins

Constituent	Concentration
Arsenic	Waters with MUN beneficial use designation: shall not exceed 0.05 mg/L as a result of controllable water quality factors.
Bacteria, Coliform	Waters with MUN beneficial use designation: total coliform numbers shall not exceed 2.2 organism/100 mL median over any seven-day period as a result of controllable water quality factors.
Barium	Waters with MUN beneficial use designation: shall not exceed 1.0 mg/L as a result of controllable water quality factors.
Boron	Shall not exceed 0.75 mg/L as a result of controllable water quality factors.
Chloride	Waters with MUN beneficial use designation: shall not exceed 500 mg/L as a result of controllable factors.
Color	Waste discharges shall not result in coloration of the receiving waters that causes a nuisance or adversely affects beneficial uses.
Cyanide	Waters with MUN beneficial use designation: shall not exceed 0.2 mg/L as a result of controllable water quality factors.
Fluoride	Waters with MUN beneficial use designation: shall not exceed 1.0 mg/L as a result of controllable water quality factors.
Hardness	Waters with MUN beneficial use designation: shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.
Metals	Waters with MUN beneficial use designation: shall not exceed the following: Cadmium 0.01 mg/L; Chromium 0.05 mg/L; Cobalt 0.2 mg/L; Copper 1.0 mg/L; Iron 0.3 mg/L; Lead 0.05 mg/L; Manganese 0.05 mg/L; Mercury 0.002 mg/L; Selenium 0.01 mg/L; and Silver 0.05 mg/L, as a result of controllable water quality factors.
Methylene blue-activated substances	Waters with MUN beneficial use designation: shall not exceed 0.05 mg/L as a result of controllable water quality factors.
Oil and grease	Waste discharges shall not result in deposition of oil, grease, wax, or other materials in concentrations that cause a nuisance or adversely affect beneficial uses.
pH	Shall not be raised above 9 or depressed below 6 as a result of controllable water quality factors.
Radioactivity	Waters with MUN beneficial use designation: shall not exceed the California Code of Regulations, Title 22, standards of 5 pCi/L for combined radium-226 and radium-228, 15 pCi/L for gross alpha particle activity, 20,000 pCi/L for tritium, 8 pCi/L for strontium-90, 50 pCi/L for gross beta particle activity, and 20 pCi/L for uranium.
Sodium	Waters with AGR beneficial use designation: shall not exceed a sodium absorption rate of 9.
	Waters with MUN beneficial use designation: shall not exceed 180 mg/L as a result of controllable water quality factors.
Sulfate	Waters with MUN beneficial use designation: shall not exceed 500 mg/L as a result of controllable water quality factors.
Taste and odor	Shall not contain taste- or odor-producing substances in concentrations that adversely affect beneficial uses.
Toxic substances	All waters shall be maintained free of substances in concentrations that are toxic or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Source: *Water Quality Control Plan for the Santa Ana River Basin* (Santa Ana RWQCB 1995, last updated February 2016).

AGR = Agricultural Supply
MUN = Municipal Supply
mg/L = milligrams per liter
mL = milliliter
pCi/L = picocuries per liter
pH = percentage of hydrogen

In addition, the proposed Project would improve the hydraulics of the Santa Ana River. As part of the bridge replacement, the proposed Project would replace eight existing pier walls within the Santa Ana River (totaling an area of 0.09 acre) with four new pier walls (totaling an area of 0.05 acre). As detailed in the River Hydraulics Analysis (Civil Works Engineers, Inc. 2019a) prepared for the proposed Project, in the existing condition, a hydraulic jump occurs upstream of the bridge (i.e. flows transition from supercritical to subcritical, which represents a high energy loss with erosive potential). The proposed Project would improve the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of the subcritical flows by approximately 300 ft. Therefore, implementation of the proposed Project would have a beneficial effect on the river hydraulics upstream of the Project area. Additionally, the proposed Project would maintain the overall drainage patterns in the Project area. For these reasons, Project impacts to current, circulation, and drainage patterns would not be adverse.

Suspended Particulates (Turbidity)

Construction activities disturb and expose soil and increase the potential for soil erosion. Suspended particles, trash, and debris are often discovered on streets and highways. Because the proposed Project would increase impervious surface area, the amount of suspended solids and sediments generated within the Project area could increase. However, the increase in impervious area is minor and construction and operational BMPs would be implemented to reduce pollutants of concern in runoff, including suspended particles. Therefore, impacts related to suspended pollutants would not be adverse.

Oil, Grease, and Chemical Pollutants

Grading and earthmoving equipment is a source of chemicals, liquid products, and petroleum products if the equipment leaks. Chemicals, liquid products, and petroleum products (such as paints, solvents, and fuels), and concrete-related waste may be spilled or leaked during construction and have the potential to be transported via storm runoff into receiving waters. During operation, oil, grease, and toxic organic compounds are pollutants of concern from transportation facilities. These pollutants of concern can be generated from maintenance activities as well as vehicles operating on the facility. However, the increase in impervious area is minor and construction and operational BMPs would be implemented to reduce pollutants of concern in runoff, including oil, grease, and chemical pollutants. Therefore, impacts related to oil, grease, and chemical pollutants would not be adverse.

Temperature, Oxygen Depletion, and Other Parameters

The proposed Project is not anticipated to impact the temperature or decrease oxygen in receiving waters. In addition, Reach 1 of the Santa Ana River is not listed as impaired by temperature or low dissolved oxygen. Therefore, the proposed Project does not have a potential to impact receiving water temperature or oxygen levels.

Flood Control Functions

As discussed previously, the proposed Project would improve the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of the subcritical flows by approximately 300 ft. Therefore, implementation of the proposed Project would have a beneficial effect on the flood control functions of the surface waters upstream of the Project area.

Storm, Wave, and Erosion Buffers

The Project area is approximately 9.5 miles from the coast and would have no impact on storm, wave, or erosion buffers.

Erosion and Accretion Patterns

The increase in impervious area would increase the volume of stormwater runoff from the Project area into the Santa Ana River. However, the Santa Ana River is a stabilized concrete channel and is not susceptible to hydromodification (County of Orange 2012). Therefore, increasing flow to this channel would not change sediment transport or increase downstream erosion and accretion.

Aquifer Recharge/Groundwater

Groundwater dewatering during construction may be required during construction of the bridge piles to ensure groundwater levels are below the pile cap elevation (Earth Mechanics, Inc., 2018). However, groundwater dewatering would be temporary, and the volume of groundwater removed would be minimal compared to the size of the groundwater basin. Therefore, Project construction would not substantially change groundwater levels in the groundwater basin.

The Project would increase impervious surface areas on site, which can decrease infiltration. However, due to the large amount of impervious surface area in the vicinity of the Project area and within the Santa Ana River channel, minimal infiltration would be expected to occur in the existing conditions. Additionally, the increase in impervious surface area 8,500 square feet (approximately 0.2 acre) is minimal compared to the size of the watershed and the amount of existing impervious surface area in the vicinity of the Project area. In addition, operation of the proposed Project would not require groundwater extraction. Therefore, the proposed Project would not substantially deplete groundwater supplies or interfere with groundwater recharge.

Baseflow

Baseflow is streamflow that results from precipitation that infiltrates the soil and eventually moves through the soil to the stream channel. This is also referred to as groundwater flow or dry-weather flow. The Santa Ana River is concrete lined, so there is no baseflow in the Project area. Therefore, the proposed Project would not impact baseflow.

4.2 Anticipated Changes to the Biological Characteristics of the Aquatic Environment

Special Aquatic Sites

According to the Natural Environment Study (Minimal Impacts) (NES[MI]; LSA 2018a) prepared for the proposed Project, there are no wetlands or riparian areas present in the Project area. There are no ASBSs within or downstream of the Project area. However, the Santa Ana River is subject to USACE, California Department of Fish and Wildlife, and Santa Ana RWQCB jurisdiction. Although an increase in pollutant loading from construction activities and the increase in impervious surface area can impact the water quality in the Santa Ana River, the disturbance area and increase in impervious area is minimal and construction and operational BMPs would be implemented to reduce pollutants of concern in runoff. Therefore, the proposed Project would not have an adverse effect water-quality related impact on special aquatic sites.

Habitat for Fish and Other Aquatic Organisms

Designated intermittent beneficial uses of Reach 1 of the Santa Ana River include Warm Freshwater Habitat (WARM). However, according to the NES(MI) prepared for the proposed Project (LSA 2018a), there are no aquatic resources within the Project area that would provide habitat for fish or other aquatic species. The Santa Ana River is concrete-lined, devoid of vegetation, and conveys intermittent flows. Therefore, the proposed Project does not have the potential to impact the beneficial uses of warm freshwater habitat in the Santa Ana River.

Wildlife Habitat

Designated intermittent beneficial uses of Reach 1 of the Santa Ana River include Wildlife Habitat (WILD). However, according to the NES(MI) prepared for the proposed Project (LSA 2018a), there are no aquatic resources within the Project area that would provide wildlife habitat for terrestrial or aquatic species. The Santa Ana River is concrete-lined, devoid of vegetation, and conveys intermittent flows. Therefore, the proposed Project does not have the potential to impact the beneficial uses of wildlife habitat in the Santa Ana River.

According to the NES(MI), mammals such as coyote, raccoon, opossum, and skunk have adapted to densely developed urban environments and may utilize the Santa Ana River as a movement corridor; however, the lack of vegetative cover within the concrete channel and high level of anthropogenic disturbance may limit use. Wildlife may use the river as a source of water when flows are present. However, this would only occur intermittently, as the Santa Ana River only conveys intermittent flows. Poor water quality could be toxic to wildlife that may use the river as a source of water. However, the disturbance area and increase in impervious area is minimal and the proposed Project would implement construction and operational BMPs to target pollutants of concern in stormwater runoff such that the proposed Project would not degrade water quality or result in water-quality related impacts to wildlife using the river as a wildlife corridor.

Endangered or Threatened Species

According to the NES(MI), there are no aquatic or aquatic-dependent endangered or threatened plant or animal species known or expected to occur within the Project area. In addition, beneficial uses of Reach 1 of the Santa Ana River do not include Habitat for Rare, Threatened, or Endangered Species (RARE). Therefore, the proposed Project would not result in water quality-related impacts to endangered or threatened aquatic species.

Invasive Species

The Santa Ana River is devoid of vegetation within the Project area. Although the proposed Project has the potential to spread invasive plant species, there are no adjacent native aquatic habitats that may become contaminated. Therefore, no change to aquatic or riparian invasive species is anticipated as a result of the proposed Project.

4.3 Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

Existing and Potential Water Supplies; Water Conservation

The water service provider in the Study Area is Santa Ana Municipal Utility Services. Other than the proposed area of revegetation and vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area, no landscaping is proposed. Any water use for establishment and maintenance of the revegetated area and vegetated swale would be minimal. The proposed Project would implement structural source control BMPs, which would include use of efficient irrigation systems and landscape design, water conservation, smart controllers to reduce water usage. There are no other demands for harvested water that exist in the Project area.

Recreational or Commercial Fisheries

The beneficial uses of the Santa Ana River do not include commercial and sportfishing (COMM). In addition, the river is not used for water-related recreation or commercial fishing within or adjacent to the Project area. Therefore, the proposed Project would not have an adverse effect on recreational or commercial fisheries.

Other Water-Related Recreation

Although the beneficial uses of Reach 1 of the Santa Ana River include Water Contact Recreation (REC-1) and Non-Contact Water Recreation (REC-2), the river is not used for water-related recreation within or adjacent to the Project area. Therefore, the proposed Project would not have an adverse effect on water-related recreation.

Aesthetics of the Aquatic Environment

The SART is a multi-use recreational trail that parallels both sides the Santa Ana River within the Project area. The Santa Ana River is an aesthetic component that contributes to the enjoyment of users of the SART, particularly when water is present within the river. Trash and debris, oil and grease, nutrients, and sediment can detract from the aesthetics of a waterbody. Trash and debris can accumulate in the waterways. Oil and grease float on the water surface and often have a distinctive sheen and/or smell. Sediment increases turbidity and can turn water a murky brown color. Nutrients can promote algal blooms and reduce the clarity of surface waters. The Project has the potential to impact the aesthetics of the Santa Ana River by increasing pollutant loading. However, the disturbance area and increase in impervious area is minimal and construction and operational BMPs would be implemented to reduce pollutants of concern in runoff. Therefore, the proposed Project would not have an adverse effect on the aesthetics of the aquatic environment.

Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, and Wilderness Areas

The Santa Ana River is not designated as a wild and scenic river by the National Wild and Scenic Rivers System. In addition, there are no national or historic monuments, national seashores, or wilderness areas in the vicinity of the Project area. No resources listed or eligible for listing in the National Register of Historic Places or the California Historical Landmarks were identified as part of the draft *Historic Property Survey Report* (LSA 2019a) and *Historic Resources Evaluation Report* (LSA 2019b) prepared for the proposed Project. However, the SART parallels both sides of the Santa Ana River in the Project area. As discussed previously, the Santa Ana River is an aesthetic component that contributes to the enjoyment of users of this resource, particularly when water is present within the river.

As also discussed previously, trash and debris, oil and grease, nutrients, and sediment can detract from the aesthetics of a waterbody. The Project has the potential to impact the aesthetics of the Santa Ana River by increasing pollutant loading. However, the disturbance area and increase in impervious area is minimal and construction and operational BMPs would be implemented to reduce pollutants of concern in runoff. Therefore, the proposed Project would not have an adverse water quality related effect on the use of the SART.

Traffic/Transportation Patterns

The Santa Ana River is not used for transportation. Therefore, the proposed Project would not have an adverse effect on aquatic traffic/transportation patterns.

Energy Consumption or Generation

The Santa Ana River is not used for energy generation. Therefore, the proposed Project would not have an adverse effect on energy consumption or generation.

Navigation

The Santa Ana River within the Project area is not used for navigation. According to the NES(MI) prepared for the proposed Project, downstream of the Project area the channel has a direct nexus to the Pacific Ocean (a navigable water of the U.S.) and is tidally influenced at its mouth. However, the tidal influence does not extend to the Project area. Because the Santa Ana River is not used for navigation in the Project area, the proposed Project would not have an adverse effect to aquatic navigation.

Safety

As discussed previously, the proposed Project would improve the river hydraulics upstream of the bridge by lowering the water surface elevation and reducing the length of the subcritical flows by approximately 300 ft. Therefore, implementation of the proposed Project would have a beneficial effect on the flood control functions of the surface waters upstream of the Project area. Because the proposed Project would not increase flooding in the Project area, no safety impacts related to flooding would occur.

4.4 Short Term Impacts During Construction

No Build Alternative

Under the No Build Alternative, no improvements to Fairview Street between 9th Street and 16th Street would occur and the Fairview Street bridge over Santa Ana River would not be replaced. Therefore, no soil would be disturbed, and there would be no increase in the potential for soil erosion or sedimentation compared to existing conditions. Additionally, there would be no increased risk of spills from construction equipment or materials use.

Build Alternative

Pollutants of concern during construction 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 water quality. During construction activities, excavated soil would be exposed and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. According to the *Draft Water Quality Management Plan (WQMP)* (Civil Works Engineers 2019b) prepared for the proposed Project, the disturbed soil area during construction would be 1.15 acre. However, project construction may disturb additional area depending on any sound barriers incorporated into the proposed Project. In addition, there is a potential for chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and concrete-related waste to be spilled or leaked and transported via storm runoff into receiving waters.

Construction activities within the Santa Ana River during bridge replacement have the greatest potential to impact water quality. However, construction within the river would not occur during the rainy season.

Activities above and within the river are anticipated to include demolition of the existing concrete bridge, saw cutting and removal of the concrete invert (i.e., the channel lining below the bridge), excavation (3 feet deep at the channel bottom and 6 feet deep at the abutments), pile driving, and installation of concrete for the pile caps, columns, and reconstructed invert. A potential temporary bicycle detour route may be constructed within the Santa Ana River channel. This potential detour route would be constructed and deconstructed during dry-season work within the channel. The detour route would have a dirt base with an asphalt surface and would be entirely removed prior to completion of construction.

Diversion of flows within the Santa Ana River is not anticipated to be required because construction activities would not take place within the low flow portion of the channel. However, sandbags or concrete k-rails with plastic sheets may be required upstream of the work area to ensure any water that escapes the low flow channel is diverted back to the low flow channel before reaching the construction area. A staging area would be located within along the riverbank (see Figure 2). No materials or equipment would be stored within the river channel.

Projects that disturb more than 1 acre of soil are subject to the requirements of the CGP. However, projects that disturb between 1 and 5 acres are potentially eligible for a Small Construction Rainfall Erosivity Waiver, which would exempt the project from coverage under the CGP. To obtain a waiver, a project would need to demonstrate that there would be no adverse water quality impacts, because construction activities would only take place when there is a low erosivity potential (i.e., the rainfall erosivity value in the Revised Universal Soil Loss Equation [R value] for a project is less than 5). Based on a construction start date of spring 2020 and construction end date of spring 2022, the R factor for the proposed Project would be approximately 38. Because of the long construction schedule, the R factor is well above 5, and the proposed Project would not qualify for a CGP waiver. Therefore, the proposed Project would be required to obtain coverage under and comply with the requirements of the CGP.

Based on the Risk Determination methodology outlined in the CGP, the project has a low Sediment Risk (the relative amount of sediment that can be discharged, given the project location and construction schedule) and a low Receiving Water Risk (the risk sediment discharges pose to the receiving waters), which results in a combined Risk Level of 1 (low risk to water quality). Risk Level 1 projects are subject to the best management practice (BMP) and visual inspection requirements of the CGP.

In compliance with the CGP (Measure PF-WQ-1), a SWPPP would be prepared and construction BMPs that comply with the requirements of the *Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers* (County of Orange Stormwater Program 2012) would be implemented to reduce pollutants of concern in the stormwater runoff. Construction BMPs would include, but not be limited to, Erosion Control and Sediment Control BMPs designed to minimize erosion and retain sediment on site and Good Housekeeping BMPs to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. Construction BMPs around the work area within the Santa Ana River are anticipated to include a gravel bag or fiber roll perimeter barrier to contain spills and potential runoff, to be installed and maintained year-round. Additional Construction BMPs would be determined during preparation of the SWPPP. When Construction BMPs are properly designed, implemented, and maintained to address pollutants of concern, as required in Measure WQ-1, pollutants of concern would be retained on site so they would not reach receiving waters; therefore, no adverse water quality impacts are anticipated during construction.

Groundwater dewatering may be required during construction of the bridge piles to ensure groundwater levels are below the pile cap elevation (Earth Mechanics, Inc. 2018). Release of dewatered groundwater to surface waters can introduce total dissolved solids and other constituents to surface waters. As specified in Measure WQ-2, if groundwater dewatering becomes necessary during construction, the proposed Project would be required to comply with the requirements of the De Minimus Permit. In compliance with this permit, groundwater would be tested and treated (as necessary) prior to release to surface waters to ensure that discharges do not exceed water quality limits specified in the permit. Therefore, no adverse water quality impacts are anticipated during groundwater dewatering activities.

4.5 Long-Term Impacts During Operation and Maintenance

No Build Alternative

Under the No Build Alternative, no improvements to Fairview Street between 9th Street and 16th Street would occur and the Fairview Street bridge over Santa Ana River would not be replaced. In addition, under the No Build Alternative, there would be no increase in impervious surface area. Therefore, the No Build Alternative would not result in an increase in stormwater runoff or long-term pollutant loading compared to existing conditions. Furthermore, Treatment BMPs would not be implemented, and stormwater would remain untreated.

Build Alternative

According to the *Draft Water Quality Management Plan (WQMP)* (Civil Works Engineers 2019b) prepared for the proposed Project, expected pollutants of concern during operation of the proposed Project include suspended solids/sediment, nutrients, heavy metals, pathogens (bacteria/viruses), pesticides, oil and grease, toxic organic compounds, and trash and debris. The pollutants of concern for the project are metals and oil and grease. The proposed Project would increase impervious area by approximately 8,500 square feet (approximately 0.2 acre), which would increase the volume of runoff during a storm and more effectively transport pollutants to receiving waters. In addition, an increase in impervious surface would increase the total amount of pollutants in the stormwater runoff, which would increase the amount of pollutants discharged to downstream receiving waters.

As specified in Measure WQ-3 (see Section 5.0), a final WQMP would be prepared for the proposed Project that would specify the LID, Source Control, Site Design BMPs, and/or Treatment Control BMPs to be incorporated into Project design to reduce the discharge of pollutants of concern to the maximum extent practicable. LID BMPs mimic a project site's existing hydrology by using design measures that capture, filter, store, evaporate, detain, and infiltrate runoff, rather than allowing runoff to flow directly to piped or impervious storm drains. Source Control BMPs are preventative measures that are implemented to prevent the introduction of pollutants into stormwater. Site Design BMPs are stormwater management strategies that emphasize conservation and use of existing site features to reduce the amount of runoff and pollutant loading generated from a project site. Treatment Control BMPs are structural BMPs designed to treat and reduce pollutants in stormwater runoff prior to release to receiving waters.

Currently, proposed BMPs include a vegetated swale adjacent to Fairview Street in the Fairview Triangle rest area. Additional treatment BMPs to treat runoff from the bridge deck may be incorporated into the bridge design at a later date during final design. According to the *Draft Water Quality Management Plan (WQMP)* (Civil Works Engineers 2019b), proposed non-structural Source Control BMPs include right-of-way landscape management, right-of-way litter control, right-of way catch basin inspection, and street sweeping. Structural source control BMPs include use of efficient irrigation systems and landscape design, water conservation, smart controllers, and source control. A Final Water Quality Management Plan would be prepared and the BMPs refined during final design. The BMPs would target and reduce constituents of concern from transportation facilities in compliance with the North Orange County MS4 Permit requirements. Therefore, when operational BMPs are implemented in accordance with NPDES Permit requirements as stipulated in Measure WQ-3, the proposed Project is not anticipated to result in long-term adverse impacts to water quality.

4.6 Cumulative Impacts

Cumulative development in the Lower Santa Ana River Watershed is a continuation of the existing urban pattern of development that has already resulted in extensive modifications to watercourses in the area. The area's watercourses have been channelized, and drainage systems have been put into place to respond to the past urbanization that has occurred in this area. For all cumulative analysis related to hydrology and water quality, the cumulative projects being considered include all potential projected development discharging to the Lower Santa Ana Watershed. Because cumulative hydrology and water quality impacts are caused by build out of properties that increase impervious area and pollutant loads, cumulative development is considered to be the build out of the Lower Santa Ana River over an extended period of time, resulting in development of all available parcels consistent with local and regional plans.

New development and redevelopment can result in increased urban pollutants in dry-weather and stormwater runoff from project sites. Each project must comply with NPDES permitting requirements and include BMPs to avoid impacts to water quality and local hydrology in compliance with local ordinances and plans adopted to comply with requirements of the various NPDES permits. Specifically, all projects that disturb one acre or more of soil must comply with the CGP. Caltrans projects must comply with the Caltrans MS4 Permit. Local projects within the cities and the county must comply with the North Orange County MS4 Permit. Each project must consider impaired receiving waters and annual TMDL loads for receiving waters. The TMDL program is designed to identify all constituents that adversely affect the beneficial uses of waterbodies and then identify appropriate reductions in pollutant loads or concentrations from all sources so that the receiving waters can maintain/attain the beneficial uses in the Basin Plan. Thus, by complying with TMDLs, a project's contribution to overall water quality improvement in the Lower Santa Ana Watershed in the context of the regulatory program is designed to account for cumulative impacts.

Regional programs and BMPs such as TMDL programs and the MS4 Permit Program have been designed under an assumption that the Lower Santa Ana River Watershed would continue its pattern of urbanization. The regional control measures contemplate the cumulative effects of proposed development. The proposed Project would be required to comply with the requirements of the CGP and the North Orange County MS4 Permit and implement construction and operational BMPs to reduce pollutants in stormwater runoff. Compliance with these regional programs and permits constitutes compliance with programs intended to address cumulative water quality impacts. Each cumulative project would be required to develop a SWPPP (for construction), a WQMP (for local projects) or Storm Water Data Report (for Caltrans projects), and would be evaluated individually to determine appropriate BMPs and treatment measures to avoid impacts to surface water quality. Because the proposed Project's disturbance area and increase in impervious area is minimal and includes BMPs to reduce pollutants of concern in runoff from the Project area during construction and operation, the proposed Project's contribution to cumulative water quality impacts is not anticipated to be substantial.

5.0 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

The following regulatory requirements would be implemented as project design features and would reduce or avoid impacts to water quality:

Measure WQ-1: Construction General Permit. Prior to commencement of construction activities, the City of Santa Ana shall obtain coverage under the *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit)* NPDES No. CAS000002, Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ, or any other subsequent permit. This shall include submission of Permit Registration Documents (PRDs), including permit application fees, a Notice of Intent (NOI), and other compliance-related documents required by the permit, to the State Water Resources Control Board via the Storm Water Multiple Application and Report Tracking System (SMARTS). Construction activities shall not commence until a Waste Discharge Identification Number (WDID) is obtained for the project from SMARTS. Project construction shall comply with all applicable requirements specified in the Construction General Permit, including but not limited to, preparation of a Storm Water Pollution Prevention Plan (SWPPP) and implementation of construction site best management practices (BMPs) to address all construction-related activities, equipment, and materials that have the potential to impact water quality for the appropriate risk level identified for the project. The SWPPP shall identify the sources of pollutants that may affect the quality of stormwater and shall include BMPs, such Sediment Control, Erosion Control, and Good Housekeeping BMPs, to control the pollutants in stormwater runoff. Construction Site BMPs shall also confirm to the requirements specified in the latest edition of the Orange County Stormwater Program *Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers* to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed. Upon completion of construction activities and stabilization of the site, a Notice of Termination (NOT) shall be submitted via SMARTS.

Measure WQ-2: Groundwater Dewatering Permit. If groundwater dewatering is required during construction, the City of Santa Ana shall obtain coverage under the *General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality* (Order No. R8-2009-0003, NPDES No. CAG998001), or any subsequent permit. This shall include submission of a Notice of Intent (NOI) for coverage under the permit to the Santa Ana Regional Water Quality Control Board (RWQCB) at least 45 days prior to the start of dewatering. Groundwater dewatering activities shall comply all applicable provisions in the permit, including water sampling, analysis, treatment (if required), and reporting of dewatering-related discharges. Upon completion of groundwater dewatering activities, a Notice of Termination (NOT) shall be submitted to the Santa Ana RWQCB.

Measure WQ-3: Water Quality Management Plan. During the final design phase, the City of Santa Ana shall insure that a Final Water Quality Management Plan (WQMP) be prepared for the project in compliance with the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit), Order R8-2009-0030, NPDES No. CAS618030 (as amended by Order No. R8-2010-0062). The Final WQMP shall be prepared consistent with the requirements of the *Model Water Quality Management Plan (WQMP*) (2011) and *Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (WQMPs)* (TGD; 2013), or subsequent guidance manuals. The Final WQMP shall specify the BMPs to be incorporated into the project design to target pollutants of concern in runoff from the project area. The City of Santa Ana shall ensure that the BMPs specified in the Final WQMP are incorporated into the final project design.

6.0 REFERENCES

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Attachment A: Figures 1–3

ATTACHMENT A

FIGURES 1–3

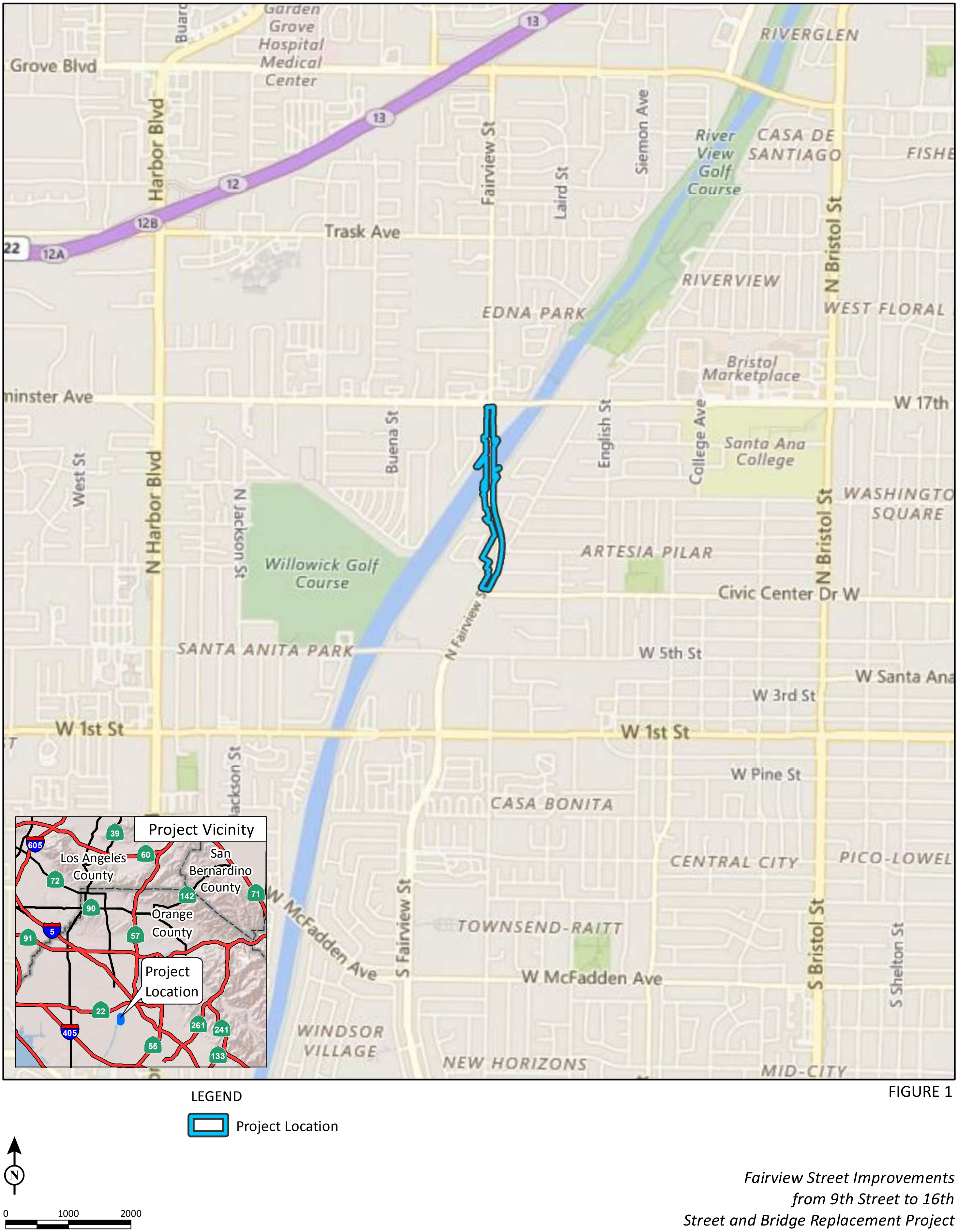


FIGURE 1

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Project Location

SOURCE: Bing (2015)

I:\WKE1702\GIS\ProjectLocationStreets.mxd (7/26/2018)

FIGURE 2

LEGEND

- Project Area
- Proposed Right of Way
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- Proposed Construction Access
- Potential Noise Barriers

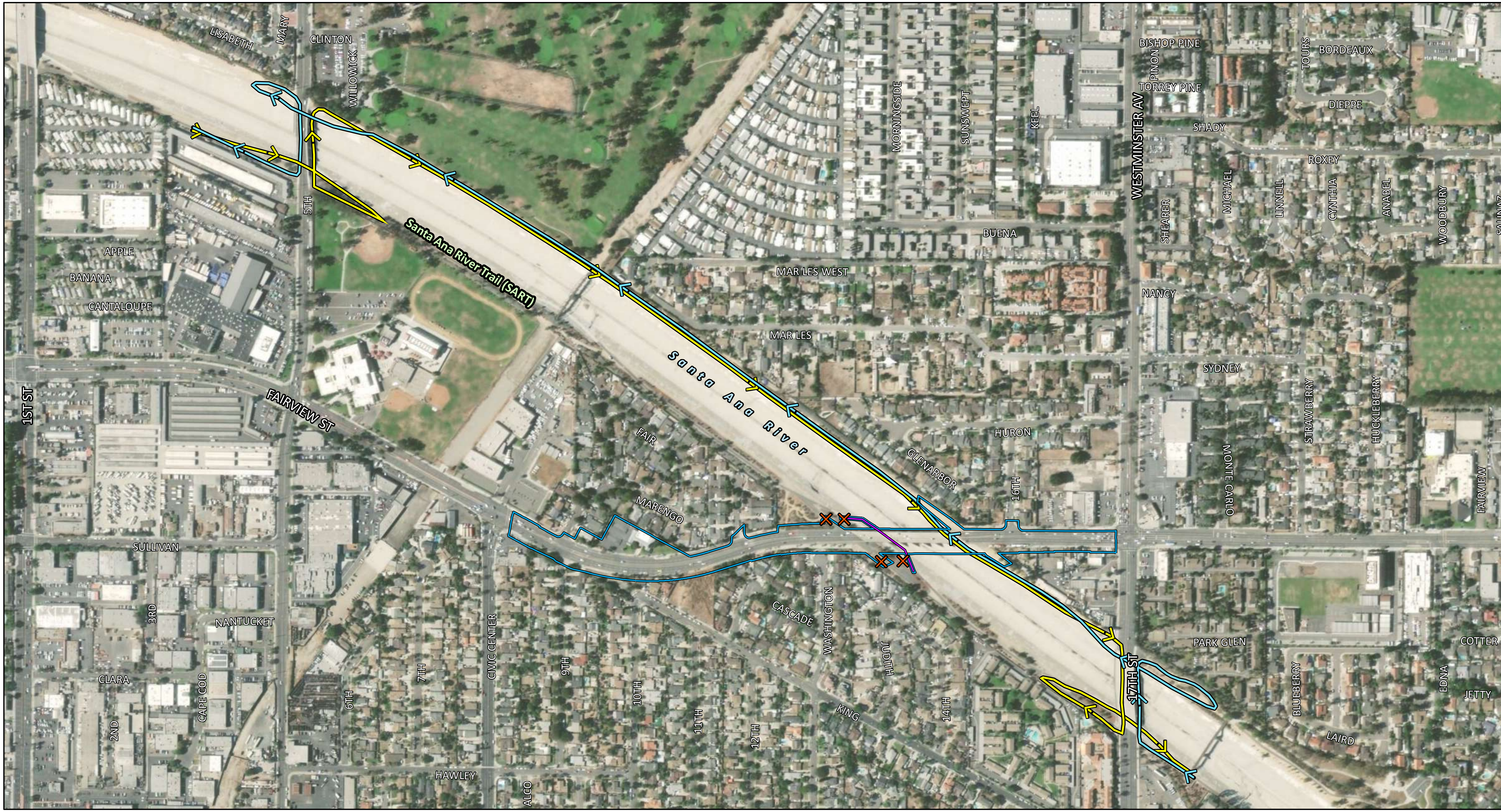
0 100 200
FEET

SOURCE: WKE (3/2018); Google (2016)

I:\WKE1702\GIS\ProposedProject.mxd (7/12/2018)

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Proposed Project



LEGEND

- Project Area
- NB Trail Detour
- SB Trail Detour
- Potential Detour in River
- Trail Closure

0 225 450
FEET

SOURCE: WKE (3/2018); Google (2016)

I:\WKE1702\GIS\BikeDetour.mxd (7/26/2018)

FIGURE 3A

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Detour for Eastern Trail Closure

LEGEND

- Project Area
- NB Detour
- SB Detour
- Potential Detour in River
- Trail Closure

0 225 450
FEET

SOURCE: WKE (3/2018); Google (2016)

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FIGURE 3B

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project

Detour for Western Trail Closure

APPENDIX B

AIR QUALITY MODELING WORKSHEETS

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Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Fairview Street Bridge Replacement

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.23	10.12	14.07	3.10	0.60	2.50	1.06	0.54	0.52	0.02	2,168.39	0.58	0.05	2,196.72
Grading/Excavation	10.64	75.89	124.43	7.70	5.20	2.50	5.24	4.72	0.52	0.16	15,845.58	4.69	0.18	16,018.04
Drainage/Utilities/Sub-Grade	7.28	55.27	81.39	6.02	3.52	2.50	3.77	3.25	0.52	0.11	10,679.82	2.75	0.13	10,787.20
Paving	1.23	13.30	12.83	0.73	0.73	0.00	0.64	0.64	0.00	0.03	2,640.47	0.56	0.12	2,691.31
Maximum (pounds/day)	10.64	75.89	124.43	7.70	5.20	2.50	5.24	4.72	0.52	0.16	15,845.58	4.69	0.18	16,018.04
Total (tons/construction project)	1.18	9.23	13.27	0.95	0.59	0.36	0.61	0.53	0.08	0.02	1,844.26	0.49	0.03	1,866.38

Notes:

Project Start Year ->	2019
Project Length (months) ->	24
Total Project Area (acres) ->	1
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	200	40
Grading/Excavation	0	0	0	0	1,120	40
Drainage/Utilities/Sub-Grade	0	0	0	0	720	40
Paving	0	80	0	120	320	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Fairview Street Bridge Replacement

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.03	0.27	0.37	0.08	0.02	0.07	0.03	0.01	0.01	0.00	57.25	0.02	0.00	52.61
Grading/Excavation	0.42	3.01	4.93	0.30	0.21	0.10	0.21	0.19	0.02	0.01	627.48	0.19	0.01	575.45
Drainage/Utilities/Sub-Grade	0.58	4.38	6.45	0.48	0.28	0.20	0.30	0.26	0.04	0.01	845.84	0.22	0.01	775.06
Paving	0.15	1.58	1.52	0.09	0.09	0.00	0.08	0.08	0.00	0.00	313.69	0.07	0.01	290.05
Maximum (tons/phase)	0.58	4.38	6.45	0.48	0.28	0.20	0.30	0.26	0.04	0.01	845.84	0.22	0.01	775.06
Total (tons/construction project)	1.18	9.23	13.27	0.95	0.59	0.36	0.61	0.53	0.08	0.02	1844.26	0.49	0.03	1,693.17

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Fairview Street Widening

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.23	10.12	14.07	5.60	0.60	5.00	1.58	0.54	1.04	0.02	2,168.39	0.58	0.05	2,196.72
Grading/Excavation	6.46	49.70	73.92	8.28	3.28	5.00	4.01	2.97	1.04	0.10	9,821.59	2.87	0.13	9,930.72
Drainage/Utilities/Sub-Grade	3.59	30.59	36.66	6.78	1.78	5.00	2.69	1.65	1.04	0.06	5,766.76	1.20	0.10	5,826.67
Paving	1.66	17.72	17.04	1.00	1.00	0.00	0.88	0.88	0.00	0.03	3,257.86	0.75	0.13	3,315.28
Maximum (pounds/day)	6.46	49.70	73.92	8.28	3.28	5.00	4.01	2.97	1.04	0.10	9,821.59	2.87	0.13	9,930.72
Total (tons/construction project)	1.15	9.30	12.73	1.71	0.59	1.12	0.77	0.53	0.23	0.02	1,809.79	0.48	0.03	1,830.52

Notes:

Project Start Year ->	2019
Project Length (months) ->	24
Total Project Area (acres) ->	1
Maximum Area Disturbed/Day (acres) ->	1
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	200	40
Grading/Excavation	0	0	0	0	800	40
Drainage/Utilities/Sub-Grade	0	16	0	30	560	40
Paving	0	64	0	120	400	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Fairview Street Widening

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.03	0.27	0.37	0.15	0.02	0.13	0.04	0.01	0.03	0.00	57.25	0.02	0.00	52.61
Grading/Excavation	0.77	5.90	8.78	0.98	0.39	0.59	0.48	0.35	0.12	0.01	1,166.81	0.34	0.01	1,070.28
Drainage/Utilities/Sub-Grade	0.28	2.42	2.90	0.54	0.14	0.40	0.21	0.13	0.08	0.00	456.73	0.10	0.01	418.64
Paving	0.07	0.70	0.67	0.04	0.04	0.00	0.04	0.04	0.00	0.00	129.01	0.03	0.01	119.10
Maximum (tons/phase)	0.77	5.90	8.78	0.98	0.39	0.59	0.48	0.35	0.12	0.01	1166.81	0.34	0.01	1,070.28
Total (tons/construction project)	1.15	9.30	12.73	1.71	0.59	1.12	0.77	0.53	0.23	0.02	1809.79	0.48	0.03	1,660.64

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Fairview Street Bridge Replacement - Mitigated				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.70	13.37	2.47	2.63	0.13	2.50	0.63	0.11	0.52	0.02	2,178.49	0.58	0.05	2,207.37
Grading/Excavation	4.90	91.58	10.81	3.13	0.63	2.50	1.04	0.52	0.52	0.16	15,855.68	4.70	0.19	16,028.69
Drainage/Utilities/Sub-Grade	3.25	60.61	7.81	2.94	0.44	2.50	0.89	0.37	0.52	0.11	10,689.54	2.76	0.13	10,797.45
Paving	0.81	15.28	4.37	0.20	0.20	0.00	0.15	0.15	0.00	0.03	2,672.32	0.57	0.13	2,724.85
Maximum (pounds/day)	4.90	91.58	10.81	3.13	0.63	2.50	1.04	0.52	0.52	0.16	15,855.68	4.70	0.19	16,028.69
Total (tons/construction project)	0.57	10.60	1.63	0.45	0.09	0.36	0.15	0.07	0.08	0.02	1,849.48	0.49	0.03	1,871.88

Notes: Project Start Year -> 2019
Project Length (months) -> 24
Total Project Area (acres) -> 1
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	200	40
Grading/Excavation	0	0	0	0	1,120	40
Drainage/Utilities/Sub-Grade	0	0	0	0	720	40
Paving	0	80	0	120	320	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Fairview Street Bridge Replacement - Mitigated				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	PM10 (tons/phase)	PM10 (tons/phase)	PM10 (tons/phase)	PM2.5 (tons/phase)	PM2.5 (tons/phase)	PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.02	0.35	0.07	0.07	0.00	0.07	0.02	0.00	0.01	0.00	57.51	0.02	0.00	52.87
Grading/Excavation	0.19	3.63	0.43	0.12	0.02	0.10	0.04	0.02	0.02	0.01	627.88	0.19	0.01	575.83
Drainage/Utilities/Sub-Grade	0.26	4.80	0.62	0.23	0.04	0.20	0.07	0.03	0.04	0.01	846.61	0.22	0.01	775.79
Paving	0.10	1.82	0.52	0.02	0.02	0.00	0.02	0.02	0.00	0.00	317.47	0.07	0.02	293.67
Maximum (tons/phase)	0.26	4.80	0.62	0.23	0.04	0.20	0.07	0.03	0.04	0.01	846.61	0.22	0.02	775.79
Total (tons/construction project)	0.57	10.60	1.63	0.45	0.09	0.36	0.15	0.07	0.08	0.02	1849.48	0.49	0.03	1,698.16

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Fairview Street Widening - Mitigated

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.70	13.37	2.47	5.13	0.13	5.00	1.15	0.11	1.04	0.02	2,178.49	0.58	0.05	2,207.37
Grading/Excavation	3.04	59.14	7.11	5.42	0.42	5.00	1.38	0.34	1.04	0.10	9,831.45	2.87	0.13	9,941.11
Drainage/Utilities/Sub-Grade	1.72	34.57	5.13	5.29	0.29	5.00	1.27	0.23	1.04	0.06	5,780.69	1.21	0.10	5,841.34
Paving	1.00	19.85	4.74	0.22	0.22	0.00	0.17	0.17	0.00	0.03	3,289.71	0.75	0.14	3,348.82
Maximum (pounds/day)	3.04	59.14	7.11	5.42	0.42	5.00	1.38	0.34	1.04	0.10	9,831.45	2.87	0.14	9,941.11
Total (tons/construction project)	0.56	10.90	1.50	1.21	0.08	1.12	0.30	0.07	0.23	0.02	1,813.59	0.48	0.03	1,834.53

Notes:

Project Start Year ->	2019
Project Length (months) ->	24
Total Project Area (acres) ->	1
Maximum Area Disturbed/Day (acres) ->	1
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	200	40
Grading/Excavation	0	0	0	0	800	40
Drainage/Utilities/Sub-Grade	0	16	0	30	560	40
Paving	0	64	0	120	400	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Fairview Street Widening - Mitigated

Project Phases (**Tons for all except CO2e. Metric tonnes for CO2e**)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.02	0.35	0.07	0.14	0.00	0.13	0.03	0.00	0.03	0.00	57.51	0.02	0.00	52.87
Grading/Excavation	0.36	7.03	0.84	0.64	0.05	0.59	0.16	0.04	0.12	0.01	1,167.98	0.34	0.02	1,071.40
Drainage/Utilities/Sub-Grade	0.14	2.74	0.41	0.42	0.02	0.40	0.10	0.02	0.08	0.00	457.83	0.10	0.01	419.70
Paving	0.04	0.79	0.19	0.01	0.01	0.00	0.01	0.01	0.00	0.00	130.27	0.03	0.01	120.31
Maximum (tons/phase)	0.36	7.03	0.84	0.64	0.05	0.59	0.16	0.04	0.12	0.01	1167.98	0.34	0.02	1,071.40
Total (tons/construction project)	0.56	10.90	1.50	1.21	0.08	1.12	0.30	0.07	0.23	0.02	1813.59	0.48	0.03	1,664.27

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

APPENDIX C

AREA OF POTENTIAL AFFECTS (APE) MAP

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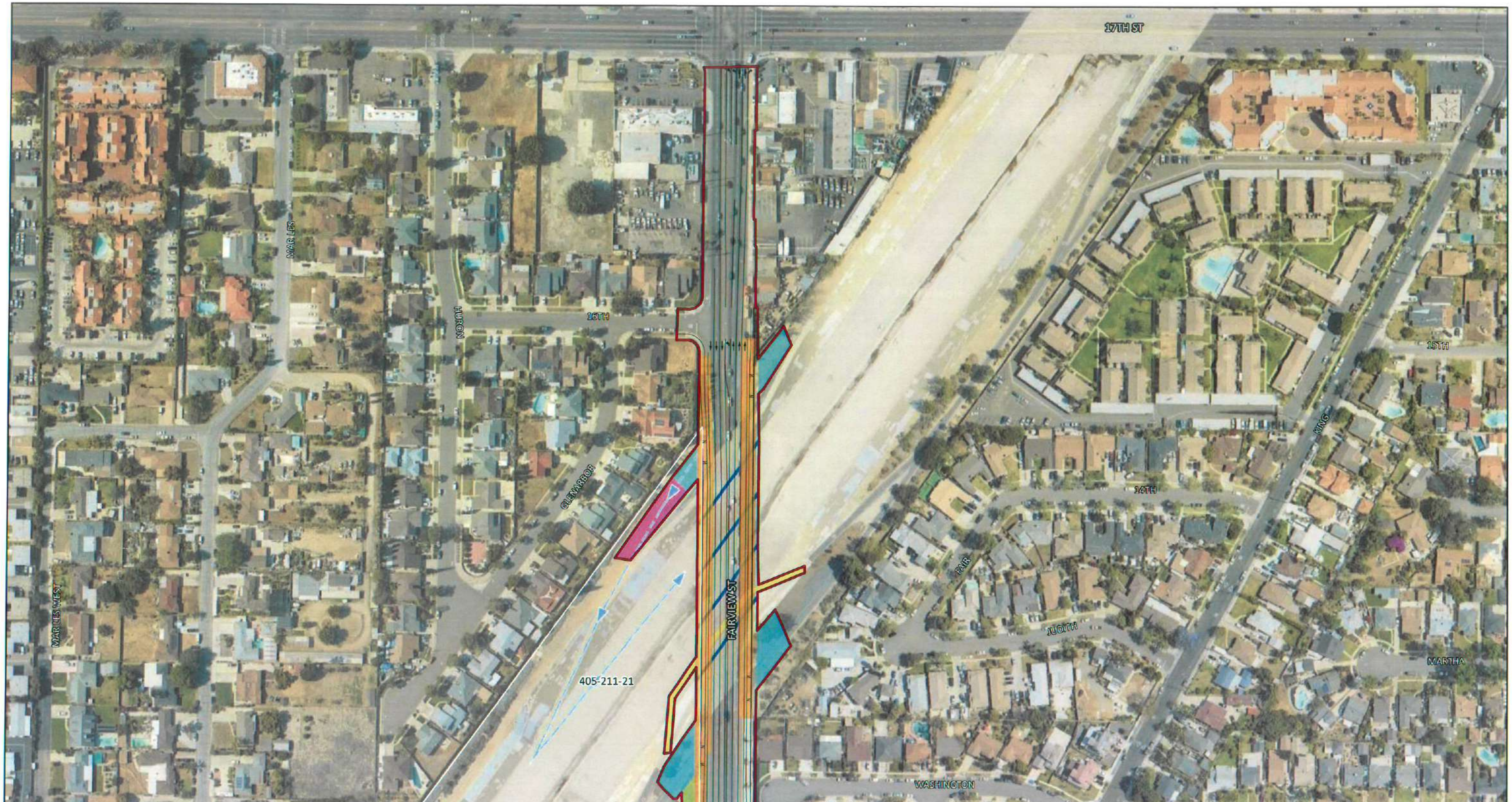

LEGEND

- Area of Potential Effects
- Proposed Right of Way Acquisition
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- (#) Resources Evaluated
- Proposed Construction Access
- Potential Noise Barriers

N

0 90 180
FEET

SOURCE: Google (2016); WKE (2018)

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Caltrans District 12 Local Assistance Engineer — Date: 6/20/19

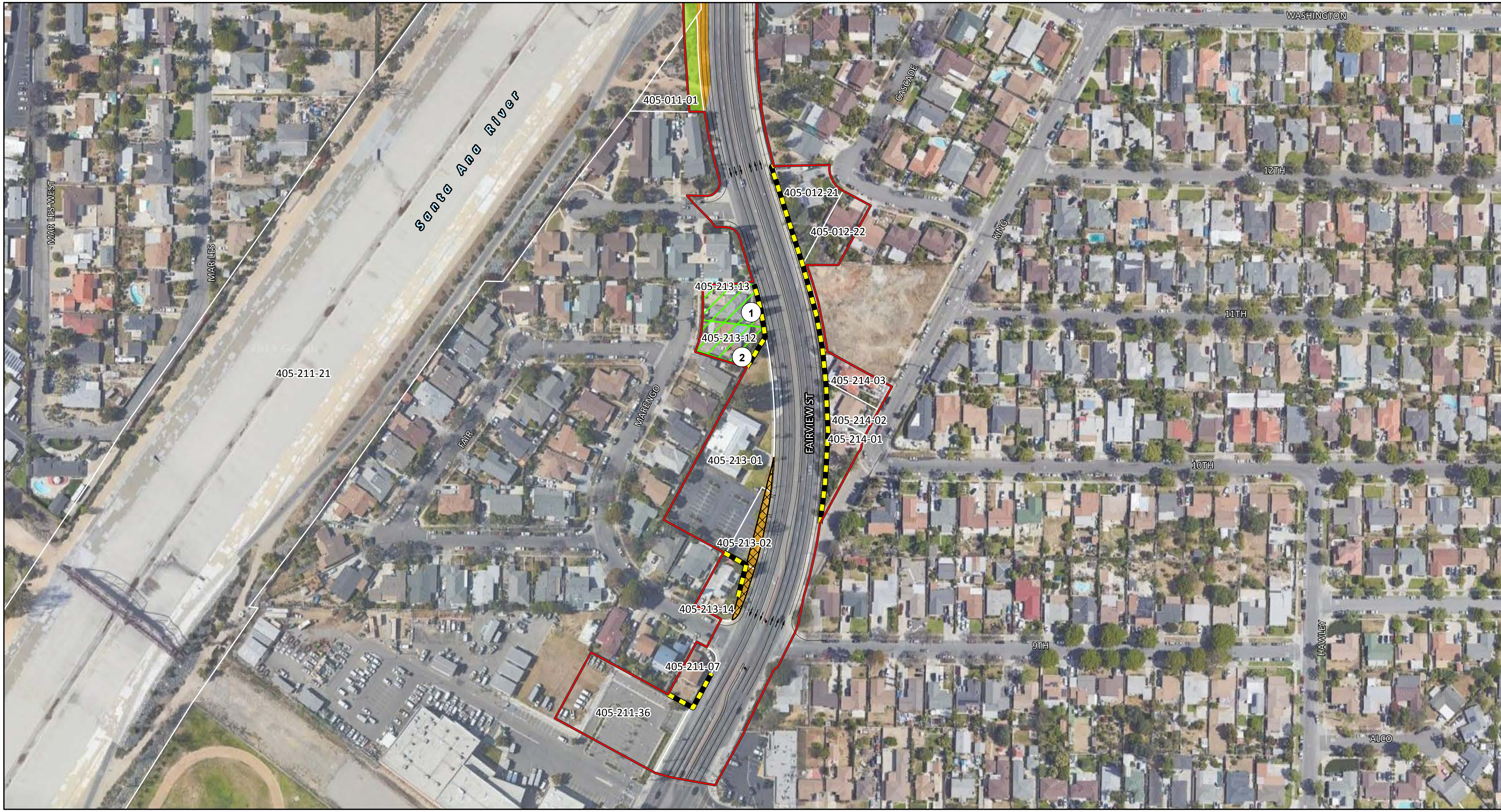
Caltrans District 12 Archaeologist — Date: 6/20/2019

MAP 3
Sheet 1 of 2

Fairview Street Improvements
from 9th Street to 16th
Street and Bridge Replacement Project

Area of Potential Effects (APE)

Federal Project No.: BRLS 5063(184)



LEGEND

- Area of Potential Effects
- Proposed Right of Way Acquisition
- Proposed Roadway Widening
- Proposed Roadway Modifications
- Proposed Bridge Piers
- Reconstruction of Access Road
- Potential Detour in River
- Grading / Revegetation / BMPS
- Construction Staging Area
- Resources Evaluated
- Proposed Construction Access
- Potential Noise Barriers

N

0 90 180
FEET

SOURCE: Google (2016); WKE (2018)
I:\WKE1702\GIS\APE.mxd (5/7/2019)

MAP 3
Sheet 2 of 2

Fairview Street Improvements from 9th Street to 16th Street and Bridge Replacement Project
Area of Potential Effects (APE)
Federal Project No.: BRLS 5063(184)

APPENDIX D

MITIGATION MONITORING AND REPORTING PROGRAM

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MITIGATION MONITORING AND REPORTING PROGRAM

MITIGATION MONITORING REQUIREMENTS

PRC Section 21081.6 (enacted by the passage of AB 3180) mandates that the following requirements shall apply to all reporting or mitigation monitoring programs:

- The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation. For those changes which have been required or incorporated into the project at the request of a Responsible Agency or a public agency having jurisdiction by law over natural resources affected by the project, that agency shall, if so requested by the Lead Agency or a Responsible Agency, prepare and submit a proposed reporting or monitoring program.

- The Lead Agency shall specify the location and custodian of the documents or other material which constitute the record of proceedings upon which its decision is based. A public agency shall provide the measures to mitigate or avoid significant effects on the environment that are fully enforceable through permit conditions, agreements, or other measures. Conditions of project approval may be set forth in referenced documents which address required mitigation measures or in the case of the adoption of a plan, policy, regulation, or other project, by incorporating the mitigation measures into the plan, policy, regulation, or project design.

- Prior to the close of the public review period for a draft Environmental Impact Report or MND, a Responsible Agency, or a public agency having jurisdiction over natural resources affected by the project, shall either submit to the Lead Agency complete and detailed performance objectives for mitigation measures which would address the significant effects on the environment identified by the Responsible Agency or agency having jurisdiction over natural resources affected by the project, or refer the Lead Agency to appropriate, readily available guidelines or reference documents. Any mitigation measures submitted to a Lead Agency by a Responsible Agency or an agency having jurisdiction over natural resources affected by the project shall be limited to measures which mitigate impacts to resources which are subject to the statutory authority of, and definitions applicable to, that agency. Compliance or noncompliance by a Responsible Agency or agency having jurisdiction over natural resources affected by a project with that requirement shall not limit that authority of the Responsible Agency or agency having jurisdiction over natural resources affected by a project, or the authority of the Lead Agency, to approve, condition, or deny projects as provided by this division or any other provision of law.

MITIGATION MONITORING PROCEDURES

The mitigation monitoring and reporting program for the proposed project was prepared in compliance with PRC Section 21081.6. It describes the requirements and procedures to be followed by the City of Santa Ana to ensure that all mitigation measures adopted as part of the proposed project would be carried out as described in this IS/MND. Table A.1 lists each of the mitigation measures specified in this IS/MND and identifies the party or parties responsible for implementation and monitoring of each measure.

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
3.1 AESTHETICS			
Mitigation Measure AES-1: Street Lighting. Low-light level, energy-efficient, and directed illumination, and separate pedestrian-scale lighting integrated with an aesthetically enhanced bridge barrier shall be specified in the design and construction of the proposed Project.	City of Santa Ana Public Works Director or designee	During Project design and construction	
3.2 AGRICULTURE AND FORESTRY RESOURCES			
There are no significant impacts to agriculture and forestry resources.			
3.3 AIR QUALITY			
Mitigation Measure AQ-1: Construction Emissions Control. The Construction Contractor will provide the City of Santa Ana (City) Public Works Director with documentation that the following procedures are adhered to during construction activities: • The contractor will adhere to the Greenbook (2018 or most current) specification: Section 3-12.2 Air Pollution Control. The Contractor will not discharge smoke, dust, equipment exhaust, or any other air contaminants into the atmosphere in such quantity as will violate any federal, State, or local regulations. The contractor will also abate dust nuisance by cleaning, sweeping and spraying with water, or other means as necessary. • The contractor will adhere to the Caltrans Standard Specifications for Construction, Sections 14.9-01, 14.9-02, 14-9.03, 18-1.02C, and 18-1.03 (or Greenbook [2018 or most current] equivalent specifications). 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. • Water or a 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 in compliance with the SCAQMD Rule 403 (Fugitive Dust). • Soil binder will be spread on any unpaved roads used for construction purposes, and on all Project construction parking areas (providing an estimated 50 percent reduction of fugitive emissions) in compliance with the SCAQMD Rule 403 (Fugitive Dust). • Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions in compliance with the SCAQMD Rule 403 (Fugitive Dust). • Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low-sulfur fuel as required by CCR Title 17, Section 93114. • 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 in compliance with the SCAQMD Rule 403 (Fugitive Dust). • Equipment and material storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly in compliance with the SCAQMD Rule	Construction Contractor	During construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
402 (Nuisance). • Environmentally sensitive areas 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 [as required by CCR Title 13, Section 2485(c)]. • Track-out reduction measures will be used, such as gravel pads at Project access points to minimize dust and mud deposits on roads affected by construction traffic, in accordance with the State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4). • 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 during transportation in compliance with the SCAQMD Rule 403. • Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce PM emissions [State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4)]. • 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 (consistent with the traffic control plan approved by the City of Santa Ana Traffic Engineer). • Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown PM 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 require controls such as dampened straw [Caltrans Standard Specifications for Construction, Sections 18.1-02C (Dust Control Binders) and 18-1.03 (Construction – Dust Palliatives) or Greenbook (2018 or most current) equivalent]. • During demolition, 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 shall be either sufficiently watered or securely covered to prevent excessive amounts of dust. The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized 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. • Project construction plans will show the duration of construction. Ozone precursor emissions from construction equipment vehicles will be controlled by maintaining equipment engines in good condition and in proper tune per manufacturers' specifications. • 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			

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
the prevention of such material spilling onto public streets and roads. • Construction activities will adhere to the City Special Provisions, Greenbook (2018 or most current) standard specifications, or California Department of Transportation (Caltrans) Standard Specifications for Construction, Sections 14-9.02 and 14-9.03, as applicable. • Should the Project geologist determine that asbestos-containing materials (ACMs) are present at the Project area during final inspection prior to construction, the appropriate methods will be implemented to remove ACMs. • All construction vehicles both on and off site shall be prohibited from idling in excess of 5 minutes. • The Construction Contractor shall require all off-road diesel-powered construction equipment of greater than 50 horsepower used for the Project meets the California Air Resources Board Tier 4 emissions standards.			
3.4 BIOLOGICAL RESOURCES			
Mitigation Measure BIO-1: Nesting Bird Surveys and Avoidance. If vegetation removal, construction, or grading activities are planned to occur within the nesting bird season (February 1 to September 30), the City of Santa Ana (City) Public Works Director or designee shall ensure that a qualified biologist conducts a preconstruction nesting bird survey no more than three days prior to the start of such activities. The nesting bird survey shall include the Project site and areas immediately adjacent to the site that could potentially be affected by Project-related activities such as noise, vibration, increased human activity, and dust, etc. For any active nest(s) identified, the qualified biologist shall establish an appropriate buffer zone around the active nest(s). The appropriate buffer shall be determined by the qualified biologist based on the species, location, and nature of the proposed activities. Project activities shall be avoided within the buffer zone until the nest is deemed no longer active by the qualified biologist.	City of Santa Ana Public Works Director or designee/ Construction Contractor	During construction if work during the nesting season (February 1 to August 31) is delayed for longer than a period of 10 consecutive days	
Mitigation Measure BIO-2: Bat Eviction/Exclusion. To avoid direct mortality of individual bats, the City Public Works Director or designee shall ensure that humane evictions (if bats are present) and exclusions of roosting bats shall be performed under the supervision of a California Department of Fish and Wildlife (CDFW) approved bat biologist prior to bridge demolition activities. Eviction/exclusion activities shall be performed in the fall (September or October) prior to bridge demolition. Exclusion activities may be implemented in one or two phases at the discretion of the qualified bat biologist and in coordination with the City Public Works Director or designee and Project Design Team.	City of Santa Ana Public Works Director or designee/ Project Design Team/ Construction Contractor	Prior to and during construction	
Mitigation Measure BIO-3: Alternate Bat Roosting Habitat. The City Public Works Director or designee shall ensure that alternate bat roosting habitat is incorporated into the design of the new bridge to replace crevice habitat lost from removal of the existing Fairview Street bridge over the Santa Ana River. The specifications for this replacement habitat shall be designed in consultation with a qualified bat biologist.	City of Santa Ana Public Works Director or designee	During Project design	
Mitigation Measure BIO-4: Swallow Nest Removal. The City Public Works Director or designee shall ensure that if swallow nests are removed to prevent swallows from nesting within the Project area	City of Santa Ana Public Works Director or	Prior to and during construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
during construction activities, they shall be removed in the fall (i.e., September or October) prior to expected or potential overwintering use by bats, and in a manner that ensures they do not fall to the ground or are otherwise destroyed, unless the absence of bats is confirmed through inspection by a qualified bat biologist.	designee/ Construction Contractor		
Mitigation Measure BIO-5: Nighttime Lighting during Construction. To minimize temporary indirect impacts during nighttime work for Project construction within 200 feet of the bridge structures, the Construction Contractor shall ensure that night lighting is used only in the area actively being worked on and focused on the direct area of work, and airspace access to and from the roost features of a structure shall not be obstructed except in direct work areas.	City of Santa Ana Public Works Director or designee/ Construction Contractor	During construction	
Mitigation Measure BIO-6: New Bridge Lighting. To avoid permanent indirect impacts to roosting and foraging bats, the City Public Works Director or designee shall ensure that bridge lighting on the new bridge is designed and installed in such a way that light overspill into the Santa Ana River and beneath the bridge is limited to the greatest extent practicable.	City of Santa Ana Public Works Director or designee	During Project design	
Mitigation Measure BIO-7: Resource Agency Permits. Prior to construction of the Project the City Public Works Director or designee shall submit resource agency permit applications and obtain permits authorizations from the United States Army Corps of Engineers (USACE) (Section 404 Nationwide Permit authorization), CDFW (Section 1602 Streambed Alteration Agreement), and Regional Water Quality Control Board (Section 401 Water Quality Certification). The City Public Works Director or designee shall ensure compliance with all permit conditions.	City of Santa Ana Public Works Director or designee	Prior to construction	
Mitigation Measure BIO-8: Best Management Practices (BMPs) during Construction. The Construction Contractor shall ensure that all equipment maintenance, staging, dispensing of fuel or oil, or any other such activities shall occur in designated upland areas. The designated upland areas shall be located in such a manner as to prevent any spill runoff from entering Waters of the United States and other jurisdictional waters. Silt fencing and straw wattle shall be placed in such a manner that they are able to catch or filter sediment or other construction-related debris to prevent it from entering aquatic areas, where necessary. All construction-related debris and trash shall be disposed of or secured to prevent any such waste from entering aquatic areas.	Construction Contractor	During construction	
Mitigation Measure BIO-9: Invasive Species. In order to prevent the spread of invasive species (Executive Order 13112), the Construction Contractor shall ensure that any plants removed or soil disturbed during the course of construction are contained and properly disposed of offsite. All mulch, topsoil, seed mixes, or other plantings used during landscaping activities and any erosion-control BMPs implemented shall be free of invasive plant species seeds or propagules. No vegetation listed on the California Invasive Plant Council (Cal-IPC) inventory shall be installed on the Project, and all plant palettes proposed for the Project shall be reviewed by a qualified biologist during the Final Design phase.	Construction Contractor	During construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
3.5 CULTURAL RESOURCES			
Mitigation Measure CULT-1: Cultural Resources Discovery. If archaeological cultural resources are cultural material is encountered during construction, the Construction Contractor shall ensure that work within 50 meters (165 feet) of the in the area of the discovery is stopped and will notify the City of Santa Ana (City) Public Works Director or designee. A professional archaeologist (i.e., an archaeologist registered with the Register of Professional Archaeologists) will be contacted and will visit the site required to assess the nature and significance of the find. The archaeologist will then develop proper mitigation measures for the discovery. Work could continue on other parts of the Project while cultural resources mitigation takes place.	City of Santa Ana Public Works Director/ Construction Contractor	During ground-disturbing activities and excavation activities	
Mitigation Measure CULT-2: Human Remains. The City Public Works Director or designee shall verify that all construction plans specify the requirements of California Code of Regulations (CCR) Section 15064.5(e), State Health and Safety Code Section 7050.5, and Public Resources Code (PRC) Section 5097.98. In the event that human remains are encountered in the Project area during construction activities, work within 50 feet of the discovery shall be redirected and the County Coroner notified immediately consistent with the requirements of CCR Section 15064.5(e). If the remains are determined to be Native American, the County Coroner shall notify the Native American Heritage Commission (NAHC), which shall determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The MLD recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated items in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment. Consistent with CCR Section 15064.5(d), if the remains are determined to be Native American and an MLD is notified, the City of Santa Ana Public Works Director or designee shall consult with the MLD, as identified by the NAHC, to develop an agreement for treatment and disposition of the remains.	City of Santa Ana Public Works Director/ Construction Contractor	During initial ground disturbing activities and in the event that human remains are uncovered during the construction period	
3.6 ENERGY			
There are no significant impacts to energy.			

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
3.7 GEOLOGY AND SOILS			
Mitigation Measure GEO-1: Paleontological Resources Discovery. If paleontological resources are encountered during the course of ground disturbance, the Construction Contractor shall stop work in the immediate area of the find, notify the City Public Works Director or designee, and contact a qualified paleontologist to assess the find for scientific significance. If determined to be significant by the qualified paleontologist, the fossil shall be collected from the field. The qualified paleontologist may also make recommendations regarding additional measures, such as paleontological monitoring and documentation. If found, scientifically significant resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, cataloged, and curated into the permanent collections of a museum repository. If scientifically significant paleontological resources are collected, a report of findings shall be prepared to document the collection.	City of Santa Ana Public Works Director/ Construction Contractor	During ground-disturbing construction activities	
3.8 GREENHOUSE GAS EMISSIONS			
There are no significant impacts to greenhouse gas emissions.			
3.9 HAZARDS AND HAZARDOUS MATERIALS			
Mitigation Measure HAZ-1: Hazardous Materials Testing and Removal. During Project design and construction, the Design Engineer and the Construction Contractor shall adhere to the requirements listed below. Documentation of compliance with these requirements shall be provided to the City of Santa Ana (City) Public Works Director or designee. • Treated wood waste will either be disposed of as a hazardous waste or tested and handled in accordance with California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 34 • If not tested for lead and chromium prior to removal, yellow traffic striping shall be managed consistent with California Department of Transportation (Caltrans) Standard Special Provision 14.11.12, Remove Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue, or the equivalent. • Affected pole-mounted transformers will be removed by Southern California Edison personnel or qualified contractors. • A hazardous building materials survey, including asbestos-containing materials and lead-based paint, will be conducted on the Fairview Street bridge, as well as any additional structures to be disturbed. Hazardous building materials will be removed and disposed of consistent with the South Coast Air Quality Management District (SCAQMD) Rules and Regulations and the California Health and Safety Code. • Any suspect hazardous waste found during construction activities will be handled, treated, or disposed of consistent with local, State, and federal laws.	Design Engineer/ Construction Contractor	During Project design and construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
3.10 HYDROLOGY AND WATER QUALITY			
Mitigation Measure HYDRO-1: Construction General Permit. Prior to commencement of construction activities, the City of Santa Ana (City) Public Works Director or designee shall obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) NPDES No. CAS000002, Order No. 2009-0009-DWQ, as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ, or any other subsequent permit. This shall include submission of Permit Registration Documents (PRDs), including permit application fees, a Notice of Intent (NOI), and other compliance-related documents required by the permit, to the State Water Resources Control Board via the Storm Water Multiple Application and Report Tracking System (SMARTS). Construction activities shall not commence until a Waste Discharge Identification Number (WDID) is obtained for the Project from SMARTS. Project construction shall comply with all applicable requirements specified in the Construction General Permit, including, but not limited to, preparation of a Storm Water Pollution Prevention Plan (SWPPP) and implementation of construction site best management practices (BMPs) to address all construction-related activities, equipment, and materials that have the potential to impact water quality for the appropriate risk level identified for the Project. The SWPPP shall identify the sources of pollutants that may affect the quality of storm water and shall include BMPs, such as Sediment Control, Erosion Control, and Good Housekeeping BMPs, to control the pollutants in storm water runoff. Construction Site BMPs shall also confirm to the requirements specified in the latest edition of the Orange County Stormwater Program Construction Runoff Guidance Manual for Contractors, Project Owners, and Developers to control and minimize the impacts of construction and construction-related activities, materials, and pollutants on the watershed. Upon completion of construction activities and stabilization of the site, a Notice of Termination (NOT) shall be submitted via SMARTS.	City of Santa Ana Public Works Director or designee	Prior to construction	
Mitigation Measure HYDRO-2: Groundwater Dewatering Permit. If groundwater dewatering is required during construction, the City Public Works Director or designee shall ensure that the Construction Contractor obtains coverage under the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality (Order No. R8-2009-0003, NPDES No. CAG998001), or any subsequent permit. This shall include submission of a Notice of Intent (NOI) for coverage under the permit to the Santa Ana Regional Water Quality Control Board (RWQCB) at least 45 days prior to the start of dewatering. Groundwater dewatering activities shall comply with all applicable provisions in the permit, including water sampling, analysis, treatment (if required), and reporting of dewatering-related discharges. Upon completion of groundwater dewatering activities, an NOT shall be submitted to the Santa Ana RWQCB.	City of Santa Ana Public Works Director or designee/ Construction Contractor	During construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
Mitigation Measure HYDRO-3: Water Quality Management Plan. During the final design phase, the City Public Works Director or designee shall insure that a Final Water Quality Management Plan (WQMP) be prepared for the Project in compliance with the *Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region Areawide Urban Storm Water Runoff Orange County* (North Orange County MS4 Permit or most recently adopted North Orange County MS4 Permit), Order R8-2009-0030, NPDES No. CAS618030 (as amended by Order No. R8-2010-0062). The Final WQMP shall be prepared consistent with the requirements of the Model WQMP and Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project WQMPs, or subsequent guidance manuals. The Final WQMP shall specify the BMPs to be incorporated into the Project design to target pollutants of concern in runoff from the Project area. The City Public Works Director or designee shall ensure that the BMPs specified in the Final WQMP are incorporated into the final Project design.	City of Santa Ana Public Works Director or designee	During final design	
3.11 LAND USE AND PLANNING			
There are no significant impacts to land use and planning.			
3.12 MINERAL RESOURCES			
There are no significant impacts to mineral resources.			
3.13 NOISE			
Mitigation Measure NOI-1: Construction Noise Control. During construction, the Construction Contractor will implement the standard noise controls provided below and will adhere to City of Santa Ana (City) Municipal Code construction noise restrictions. The Construction Contractor will provide the City Public Works Director or designee with documentation that the following requirements were adhered to during construction activities: • During all Project area excavation and on-site grading, the Project contractors will equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. • The Project contractor will place all stationary construction equipment so that emitted noise is directed away from receptors nearest the Project area. • The construction contractor will locate equipment staging in areas that will create the greatest distance between construction-related noise sources and receptors nearest the Project area during all Project construction. • During all Project area construction, the construction contractor will limit all construction-related activities to the hours between 7:00 a.m. and 8:00 p.m. Monday through Saturday. No construction activities will be permitted outside of these hours or on Sundays or federal holidays.	Construction Contractor	During construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
3.14 POPULATION AND HOUSING			
There are no significant impacts to population and housing.			
3.15 PUBLIC SERVICES			
There are no significant impacts to public services.			
3.16 RECREATION			
There are no significant impacts to recreation.			
3.17 TRANSPORTATION			
Mitigation Measure TR-1: Transportation Management Plan. During the construction phase, the Construction Contractor shall be required to submit a TMP to the City of Santa Ana (City) Director of Public Works, or designee, for review and approval. During construction, the City Director of Public Works, or designee, shall require the Construction Contractor to adhere to all requirements of the Traffic Management Plan (TMP). The TMP shall include the following: • Notices of lane closures in local media and posted on the City's website. • Advance notice to the public and local emergency service providers regarding the timing, location, and duration of construction activities. • Procedures for coordination with OC Parks to ensure appropriate detour routes and ensure appropriate signage is provided to display the dates of the closures and to identify the detour routes • Procedures for coordination with emergency service providers to minimize temporary delays in emergency response times. Such coordination could include the identification of alternative routes for emergency vehicles and routes across the construction area.	City of Santa Ana Public Works Director or designee	During construction	
Mitigation Measure TR-2: Fairview Street/Civic Center Drive Intersection LOS Monitoring. As part of the City's annual review of its Capital Improvement Program, the City Traffic Engineer will evaluate the function of the intersection of Fairview Street and Civic Center Drive to ensure that it operates at adequate level of service (LOS). If LOS is deficient, the City will restripe the westbound shared left-through turn lane to a shared left-through-right turn lane.	City of Santa Ana Traffic Engineer	As part of the City's annual review of its Capital Improvement Program	
3.18 TRIBAL CULTURAL RESOURCES			
There are no significant impacts to tribal cultural resources.			
3.19 UTILITIES AND SERVICE SYSTEMS			
Mitigation Measure UTL-1: Coordination with Utility Providers. During the construction phase, the Construction Contractor will coordinate with utility service providers in the area to minimize the risk of disruption of services and damage to any utility facilities present within the disturbance limits, to ensure advance notification of any temporary service disruptions to the public, and to protect the safety of the construction workers and the general public.	Construction Contractor	During construction	

Table A.1: Mitigation Monitoring and Reporting Program

Mitigation Measures	Responsible Party	Timing for Mitigation Measure	Completion Date
Mitigation Measure UTL-2: Updated Utility Survey. During the design phase, the Project Engineer will provide the City of Santa Ana (City) Director of Public Works, or designee, with an updated utility survey to update information on known utility facilities as well as previously unidentified/unknown or new utility facilities within the disturbance limits.	Project Engineer/ City of Santa Ana Public Works Director or designee	During Project design	
3.20 WILDFIRE			
There are no significant impacts to wildfire.			

Source: LSA Associates, Inc. (June 2020).

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APPENDIX E

NOTICE OF AVAILABILITY

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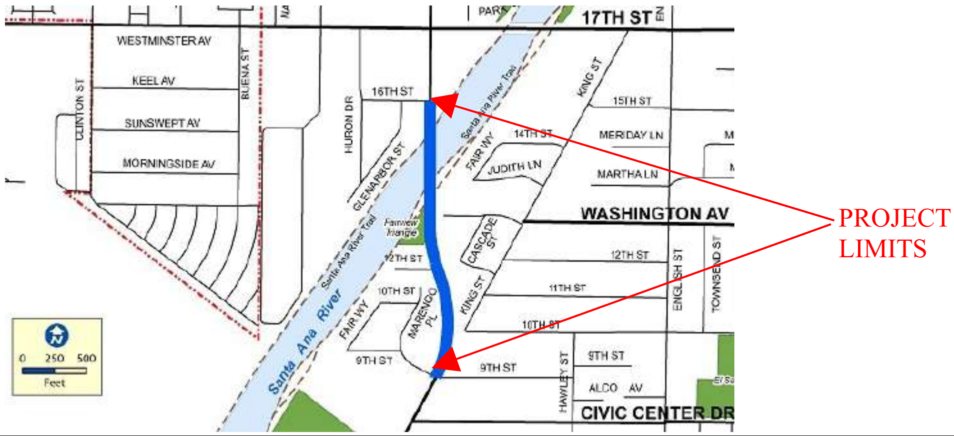
PUBLIC NOTICE

FAIRVIEW BRIDGE REPLACEMENT AND STREET IMPROVEMENTS (9^{TH} STREET TO 16^{TH} STREET)

CITY OF SANTA ANA

Notice of Availability of Draft Initial Study/Mitigated Negative Declaration



OVERVIEW	To improve pedestrian and bicyclist safety and address traffic congestion, the City of Santa Ana, in conjunction with Caltrans District 12, proposes to replace and widen the Fairview Street bridge crossing over the Santa Ana River in Santa Ana, California, to provide new sidewalks, bike lanes and an additional third lane in each direction. To be consistent with the Orange County Master Plan of Arterial Highways and the City's General Plan Circulation Element, these proposed improvements require the widening of the adjacent roadway segment along Fairview Street between 9th Street and 16th Street in order to extend these proposed features north of 9^{th} Street.
WHAT IS BEING PLANNED?	To enhance safety, mobility, and overall quality of life in the neighborhood, the City proposes to replace and widen Fairview Street bridge crossing Santa Ana River and the adjacent roadway segment to accommodate the addition of a bike lane and a third lane in each direction. The new bridge will include a complete bridge deck with barrier rails, sidewalks, bicycle lanes, a raised median, and lighting.
POTENTIAL ENVIRON-MENTAL IMPACTS	The City of Santa Ana (City), which is the California Environmental Quality Act (CEQA) lead agency, has prepared a Draft Initial Study/Mitigated Negative Declaration (IS/MND) in accordance with the CEQA guidelines for the proposed improvement of Fairview Street between 19^{th} Street to 16^{th} Street in the City of Santa Ana. The IS/MND analyzed the following environmental resource areas: air quality, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use, noise, population and housing, transportation and traffic, and utilities and service systems. The Draft IS/MND analysis identified that the proposed project would result in minimal environmental impacts related to noise, air quality and traffic during construction. All impacts were found to be less than significant with mitigation measures incorporated. The City will assist impacted property owners to relocate pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 during the right-of-way phase.
WHERE TO REVIEW AND GET INFO?	Due to the COVID-19 outbreak, all City municipal government buildings are closed to the public effective March 18, 2020. As such, the Draft IS/MND and the project's PowerPoint presentation are available on the City's website at the following link: https://www.santa-ana.org/pw/fairview-street-improvements.
WHEN AND HOW TO COMMENT?	The Draft IS/MND is available for public review/comment commencing April 6, 2020. The purpose of the public review and comment period is to afford interested parties the opportunity to provide their input on the adequacy of the environmental document. Comments will be accepted until 5 PM on May 6, 2020. Comments may be submitted to: Kenny Nguyen, City of Santa Ana, 20 Civic Center Plaza M-36, Santa Ana, CA 92702 Email: Fairview@santa-ana.org
CONTACT	For more information about this document, please contact the Public Works Agency at (714) 647-5013 or Fairview@santa-ana.org.

AVISO PÚBLICO

REEMPLAZO DE PUENTE Y MEJORAS DE CALLE EN LA CALLE FAIRVIEW, DE LA CALLE 9 A LA CALLE 16CIUDAD DE SANTA ANA

CIUDAD DE SANTA ANA

Aviso de Disponibilidad de el Esbozo

DESCRIPCIÓN	Para mejorar la seguridad de ciclistas y peatóns, y reducir la congestión del tráfico, la Ciudad de Santa Ana (Ciudad), junto con el Distrito 12 de Caltrans, propone sustituir y ensanchar el puente en la calle Fairview que atraviesa el Río de Santa Ana en Santa Ana, California. El proyecto agregará nuevas aceras, carriles para bicicletas y un carril en cada dirección. Para ser coherente con el plan maestro de carreteras arteriales del condado de orange y el plan general de circulación de la Ciudad, es requerido que el ensanchamiento de carretera a lo largo de la calle Fairview se extienda al norte de la calle 9.
¿QUÉ ESTÁ SIENDO PLANEADO?	Para mejorar la seguridad, la movilidad y la calidad de vida en general en el vecindario, la Ciudad propone reemplazar y ampliar el puente que cruza el río Santa Ana en la calle Fairview y propone agregar un carril para bicicletas y un carril para automóviles en cada dirección. El nuevo puente incluirá rieles de barrera, aceras, carriles para bicicletas, una mediana elevada e iluminación.
IMPACTOS AMBIENTALES POTENCIALES	La Ciudad de Santa Ana (Ciudad), que es la agencia principal de la Ley de Calidad Ambiental de California (CEQA, por sus siglas en inglés), ha preparado un borrador del Estudio Inicial/Declaración Negativa Mitigada (IS/MND, por sus siglas en inglés) de acuerdo con las pautas de CEQA para el proyecto de mejora propuesto para el puente en la calle Fairview entre la calle 19 y la calle 16 en la ciudad de Santa Ana. El IS/MND analizó las siguientes áreas de recursos ambientales: calidad del aire, recursos culturales, geología y suelos, emisiones de gases de efecto invernadero, peligros y materiales peligrosos, hidrología y calidad del agua, uso del suelo, ruido, población y vivienda, transporte y tráfico, servicios públicos y sistemas de servicio. Un análisis del borrador IS/MND determino que el proyecto resultaría en impactos ambientales mínimos relacionados con el ruido, la calidad del aire y el tráfico durante la construcción cuando medidas de mitigación son incorporadas. La Ciudad ayudará a los propietarios afectados por el proyecto a reubicarse en conformidad con la Ley Uniforme de Asistencia de Reubicación y Políticas de Adquisición de Bienes Inmuebles de 1970 durante la fase de derecho de paso del proyecto. Se encontró que todos los impactos fueron menos que significativos con.
¿DÓNDE PUEDO CONSEGUIR INFORMACIÓN?	Debido a la situación del COVID-19, los edificios del gobierno municipal estarán cerrados al público comenzando el 18 de marzo del 2020. El esbozo del IS/MND y una presentación sobre el proyecto están disponible en el sitio web de la ciudad en el eslabón siguiente: https://www.santa-ana.org/pw/fairview-street-improvements.
¿CUÁNDO Y COMO PUEDO COMENTAR?	El borrador del estudio IS/MND está disponible para revisión pública/comentario a partir del 6 de abril de 2020. El propósito de la revisión pública y el período de comentarios es dar a la comunidad la oportunidad de brindar su opinión sobre la idoneidad del documento ambiental. Se aceptarán comentarios hasta las 5 PM del 6 de mayo de 2020. Los comentarios se pueden enviar a Kenny Nguyen, City of Santa Ana, 20 Civic Center Plaza M-36, Santa Ana, CA 92702 Email: Fairview@santa-ana.org
INFORMACIÓN DE CONTACTO	Para más información sobre el IS/MND o el proyecto, favor de contactar a la agencia de obras pública en el (714) 647-5013 o en Fairview@santa-ana.org

THÔNG BÁO CHO CỘNG ĐỒNG

THAY THẾ CẦU FAIRVIEW VÀ CẢI THIỆN ĐƯỜNG
(ĐƯỜNG SỐ 9 ĐẾN ĐƯỜNG SỐ 16)
THÀNH PHỐ SANTA ANA
Thông báo về Bản thảo Nghiên cứu bước đầu/ Tuyên bố giảm tác động tiêu cực

TOÀN DIỆN	Thành phố Santa Ana, phối hợp với Bộ Giao thông Vận tải California Quận 12, đề xuất làm mới và mở rộng cầu đường Fairview bắc qua sông Santa Ana ở Santa Ana, California, để có vỉa hè mới, làn đường dành cho xe đạp và thêm làn đường thứ ba ở mỗi chiều nhằm tăng an toàn cho người đi bộ và người đi xe đạp và giải quyết tắc nghẽn giao thông. Những cải thiện được đề xuất này đòi hỏi phải mở rộng đoạn đường liền kề dọc theo Đường Fairview giữa Đường số 9 và Đường số 16 nhằm mở rộng thêm các phần được đề xuất này ở phía Bắc Đường số 9 để phù hợp với Quy hoạch Đường cao tốc của Quận Cam và phần lưu hành của Kế hoạch tổng thể của Thành phố.
KẾ HOẠCH ĐƯỢC LÊN RA SAO?	Thành phố Santa Ana (Thành phố), là cơ quan phụ trách Đạo luật Chất lượng Môi trường California (CEQA), đã chuẩn bị Bản thảo Nghiên cứu bước đầu/Tuyên bố giảm tác động tiêu cực (IS/MND) theo hướng dẫn của CEQA để cải thiện đề xuất Đường Fairview từ đường số 19 đến đường số 16 tại thành phố Santa Ana. Nhằm tăng cường an toàn, di chuyển và phẩm chất cuộc sống trong khu phố, Thành phố đề xuất thay thế và mở rộng cầu Đường Fairview qua sông Santa Ana và đoạn đường liền kề để phù hợp với việc thêm làn đường cho xe đạp và làn thứ ba ở mỗi chiều. Cây cầu mới sẽ bao gồm một sàn cầu hoàn chỉnh với thanh chắn, lối đi bộ, làn đường dành cho xe đạp, dải phân cách được nâng lên và điện chiếu sáng.
TÁC ĐỘNG MÔI TRƯỜNG CÓ THỂ CÓ	IS/MND đã phân tích các lĩnh vực tài nguyên môi trường sau: phẩm chất không khí, tài nguyên văn hóa, địa chất và đất, khí thải nhà kính, các mối nguy hiểm và vật liệu nguy hiểm, thủy văn và phẩm chất nước, sử dụng đất, tiếng ồn, dân cư và nhà ở, giao thông và vận chuyển, và các hệ thống dịch vụ và tiện ích. Phân tích Dự thảo IS/MND xác định rằng dự án được đề xuất sẽ dẫn đến các tác động môi trường tối thiểu liên quan đến tiếng ồn, phẩm chất không khí và giao thông trong quá trình xây cất. Thành phố sẽ hỗ trợ các chủ sở hữu tài sản bị ảnh hưởng di dời theo Đạo luật Thống nhất về các Chính sách Hỗ trợ Tái định cư và Mua lại Bất động sản năm 1970 trong giai đoạn thực hiện. Tất cả các tác động được đánh giá là rất ít với các biện pháp giảm thiểu được kết hợp.
XEM VÀ NHẬN THÔNG TIN Ở ĐÂU?	Do sự bùng phát của COVID-19, tất cả các tòa nhà chính quyền Thành phố đều đóng cửa không tiếp dân kể từ ngày 18 tháng 3 năm 2020. Dự thảo IS/MND và bản trình bày powerpoint của dự án chỉ có trên trang web của Thành phố trên liên kết sau: https://www.santa-ana.org/pw/fairview-street-improvements.
BÌNH LUẬN NHƯ THẾ NÀO VÀ VÀO KHI NÀO?	Bản thảo IS/MND sẽ được công khai cho cộng đồng xem lại/bình luận kể từ ngày 6 tháng Tư, 2020. Mục đích của giai đoạn xem xét và bình luận công khai là để cho các bên quan tâm có cơ hội phát biểu ý kiến của mình về tính thỏa đáng của tài liệu môi trường. Chúng tôi sẽ nhận bình luận cho đến 5 giờ chiều ngày 6 tháng Năm, 2020. Quý vị có thể gửi bình luận đến: Kenny Nguyen, City of Santa Ana, 20 Civic Center Plaza M-36, Santa Ana, CA 92702 Email: Fairview@santa-ana.org
LIÊN LẠC	Để biết thêm thông tin về tài liệu này, hãy liên hệ Cơ quan Công chánh qua (714) 647-5013 hay Fairview@santa-ana.org

APPENDIX F

COMMENT LETTERS RECEIVED

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Comment Letter L1

ORANGE COUNTY OC Public Works

May 5, 2020

NCL-20-0001

Kenny Nguyen
City of Santa Ana
Public Works Agency
20 Civic Center Plaza M-36
Santa Ana, CA 92702

Subject: Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street)

Dear Kenny Nguyen,

Thank you for the opportunity to comment on the Notice of Availability of Draft Initial Study/Mitigated Negative Declaration for the Fairview Bridge Replacement and Street Improvements. The County of Orange offers the following comments for your consideration. L-1-1

OC Flood Programs/Floodplain Management & Hydrology Section

1. All work, within or adjacent to any Orange County Flood Control District (OCFCD) right-of-way for flood control facilities, shall be conducted so as not to adversely impact a channel's conveyance, capacity, structural integrity, hydraulic flow conditions, access and maintainability. Furthermore, all proposed projects within OCFCD's right-of-way should be reviewed and approved by OC Public Works, and the work should be conducted only after an encroachment permit has been obtained. For information regarding the permit application process and other details, please refer to the Encroachment Permits Section link on OC Public Works' website http://www.ocpublicworks.com/ds/permits/encroachment_permits. L-1-2

2. It is acknowledged that the Draft Initial Study/Mitigated Negative Declaration provided a River Hydraulics Analysis as an appendix. However, the provided information was not detailed enough to confirm that the proposed project has minimal affects to the Santa Ana River. Detailed technical reviews and approvals for the proposed work will be accomplished within the permit process described above. In addition, all hydrologic and hydraulic studies must conform to the current guidelines and criteria as specified in the Orange County Hydrology Manual L-1-3

County Administration South
601 North Ross Street
Santa Ana, California 92701
P.O. Box 4048
Santa Ana, CA 92702-4048
info@ocpw.ocgov.com
(714) 667-8800
OCPublicWorks.com

OC Public Works

(OCHM), Addendum No. 1 to the OCHM, and the Orange County Flood Control Design Manual. Submitted reports should contain the necessary calculations and supporting files, computer models, exhibits, maps, tables, and any other information necessary to enable a complete review. L-1-3 cont.

3. Please revise Section 1.0 Project Information, Item #10 (page 1-13), to read: "United States Army Corps of Engineers (USACE): Compliance with the Nationwide Permit Program Under Section 404 Clean Water Act and Section 408 (Section 14 of the Rivers and Harbors Act of 1899, 33 USC 408)." L-1-4

If you have any questions regarding these comments, please contact Alison Camara at (714) 647-3961 in OC Flood Programs or Steven Giang at (714) 667-8816 in OC Development Services. L-1-5

Sincerely,

Richard Vuong, Interim Deputy Director
OC Public Works Service Area/OC Development Services
601 North Ross Street
Santa Ana, California 92701
Richard.Vuong@ocpw.ocgov.com

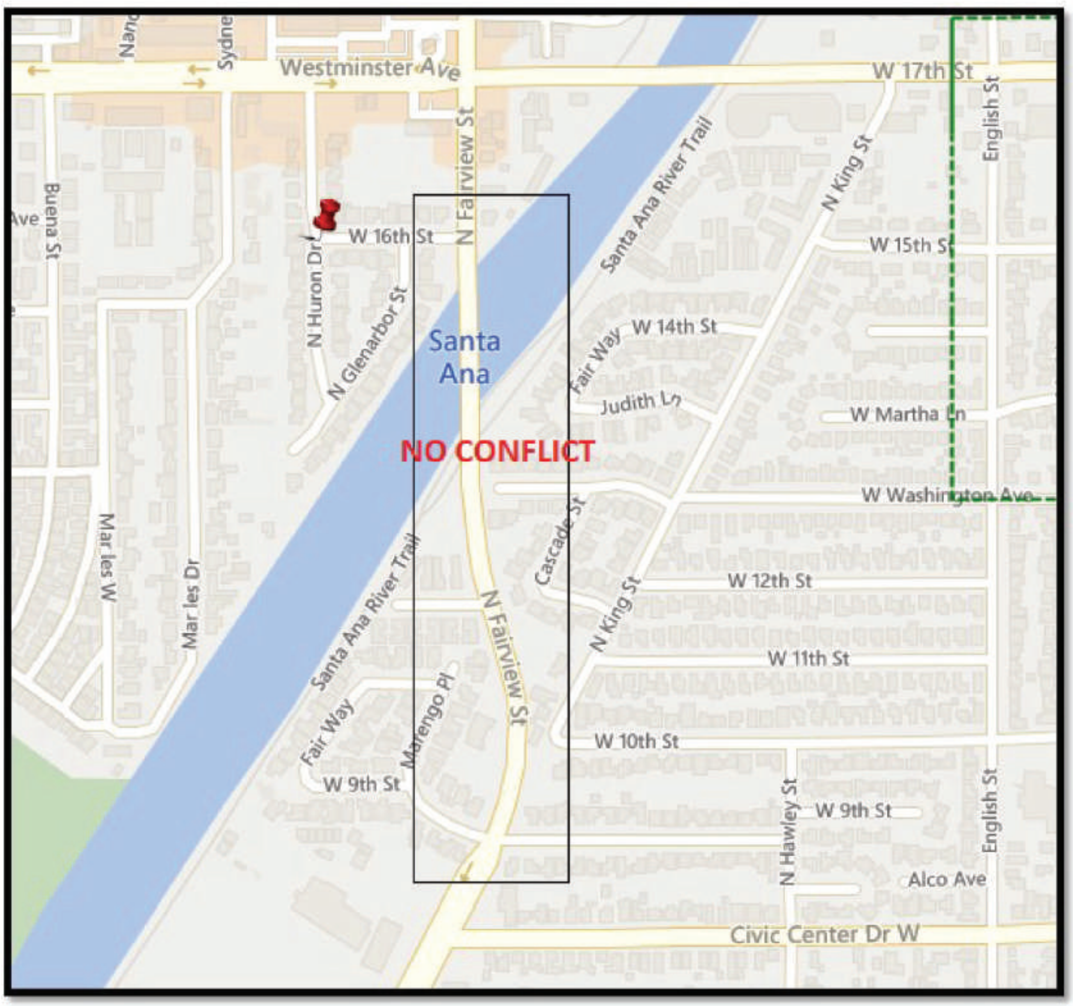
cc: Alison Camara, OC Flood Programs/Floodplain Management & Hydrology

Comment Letter U1

From: GUZMAN, MARIA <mg1371@att.com>
Sent: Thursday, May 7, 2020 9:21 AM
To: Fairview
Cc: TCGLosAngelesUtilityCon
Subject: FW: Fairview Bridge Replacement - Santa Ana
Attachments: Scan_0028.pdf

This response is for "AT&T–TCA" only. ***Name change from TCG (Teleport Communications Group) to TCA (Teleport Communications America, LLC) - Effective date of the merger is January 1, 2013*** U-1-1

There are no aerial or underground fiber facilities owned by AT&T-TCA within the project location. U-1-2



Thank you,
Maria Guzman
Utility Information Contact - LA, SF/Bay Area and Oregon

Comment Letter U1 *cont.*

From: KERWIN, DAYLA <dk8759@att.com>
Sent: Wednesday, May 6, 2020 3:01 PM
To: GUZMAN, MARIA <mg1371@att.com>
Subject: Fairview Bridge Replacement - Santa Ana

Maria,
There is a cd that came with this too if you need it.

Thanks,
Dayla

Comment Letter I1

From: Luciano Rodriguez <chanorodrig@gmail.com>
Sent: Wednesday, May 6, 2020 1:14 PM
To: Ly, Mindy; Fairview
Subject: Re: Fairview Bridge and Street Improvements

Dear Kenny and Ly,

I am glad that congestion will be lessen from the Fairview Street Improvements project. I only have one concern that I have mentioned in other meets in regards to the exit of West 9th St. During congestion, one cannot exist appropriately for two reasons: 1) When existing 9th St (East direction) by making a right turn (South Fairview), traffic is not friendly to give one a chance to make the turn. 2) When existing 9th St and making a left turn (North Fairview), again traffic is not friendly. Furthermore, during non congestion hours, making a left turn is difficult due to the hidden curve, and of course, one can make a right turn and make a U-Turn on the light of Civic Center and Fairview. Is there something that the city can do to alleviate the issue, now that there will be construction very close by? Perhaps, placing a street light to allow residents of 9th St. to exist and enter safely? Or removing the center divider and allowing people making a left turn to be in the middle lane to merge? Or at least place the wording on the pavement "Keep Clear"? I-1-1

Thank you for your time and looking at the neighbored concerns,

--
Luciano Rodriguez, Ph.D.
E-mail: chanorodrig@gmail.com

"Go confidently in the direction of your dreams. Live the life you have imagined." -Henry David Thoreau

On May 5, 2020, at 5:50 PM, Ly, Mindy <MLy@santa-ana.org> wrote:

Dear Sender:

Thank you for taking time out of your busy schedule to provide comments to the City of Santa Ana via email at Fairview@santa-ana.org regarding the Draft Initial Study / Mitigated Negative Declaration (IS/MND) for Fairview Bridge Replacement and Street Improvements project.

There has been a glitch with this email address, but the good thing is that the issues have been sorted out now and staff has verified this email address's capability to receive all external emails. We apologize for any inconvenience this issue may have caused. You can rest assured that we are doing everything to not let this happen again.

Again, the City of Santa Ana appreciates your comments for the overall success of this project. Please resend your email/comments, so they can be incorporated into the IS/MND by **5 PM on May 12, 2020**.

Respectfully,
Mindy Ly | Associate Engineer
Public Works Agency | 20 Civic Center Plaza | Santa Ana, CA 92701
714-647-5665 | mly@santa-ana.org

<image001.png> <image002.png>
http://www.santa-ana.org/

Comment Letter I-2

06/16/2020
Kristopher Fortin, Project Director
Santa Ana Active Streets
450 W 4th St,
Santa Ana, CA 92701

Re: 75B.PUBLIC HEARING - ADOPT A RESOLUTION FOR A MITIGATED NEGATIVE DECLARATION AND MITIGATION MONITORING AND REPORTING PROGRAM FOR THE FAIRVIEW BRIDGE REPLACEMENT AND STREET IMPROVEMENTS FROM 9TH STREET TO 16TH STREET (PROJECT NO. 15-6827) (NON-GENERAL FUND)

Dear Santa Ana City Council and Mayor,

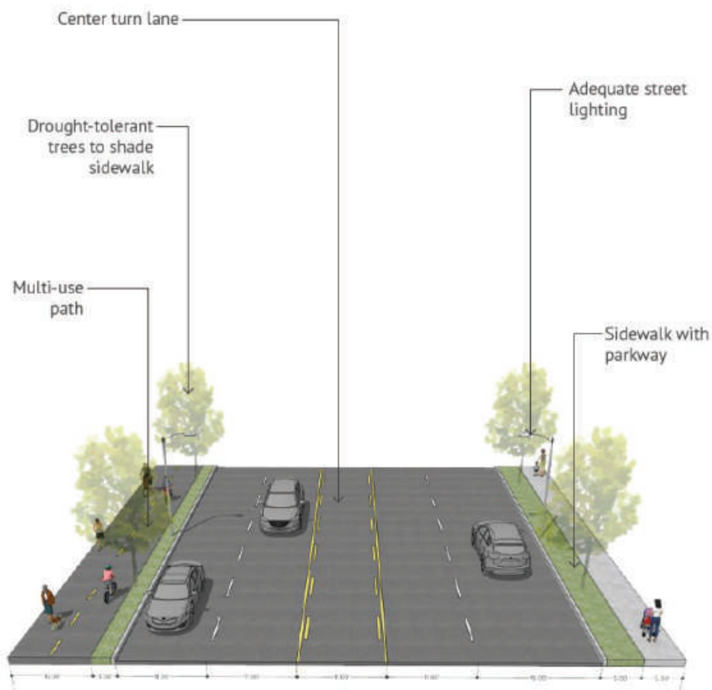
My name is Kristopher Fortin, and I'm writing this letter to oppose Item 75B Fairview Bridge Replacement and Street Improvements from 9th Street to 16th Street (PROJECT NO. 15-6827) as currently proposed.

Santa Ana Active Streets Coalition (SAAS) is a coalition of residents and community partners that aim to cultivate diverse community participation in creating a safe and accessible environment for active transportation in Santa Ana. Santa Ana is at a pivotal moment for improving mobility. The City of Santa Ana has completed various strategic initiatives to make it safer for residents to walk, bike, and be mobile through multi-modal options and developed these ideas with ambitious community engagement.

Concerning the Resolution, we appreciate the need to update the Fairview bridge as it is a safety hazard to all users, but we believe that the proposed design will continue to be unsafe for bicyclists and pedestrians and is not consistent with the City's recently approved Active Transportation Plan. On page 106-107 of the Active Transportation Plan, the street type proposed shows four general-purpose lanes, a center turn lane, a 10-foot multiuse path on the west side of the street, and a 5-foot sidewalk and 5-foot greenway on the east side of the street. This would maintain the street at 82 ft, and that is even with maintaining most general-purpose lanes at 11 ft and one lane at 15 ft. In our initial letter we submitted to the council, we proposed a different street configuration, but what is proposed in the City approved active transportation plan is even better. **What is proposed in today's agenda would widen the road to 100 ft and cause the acquisition and demolition of one residential and commercial property. And as we have seen on Bristol Street, users will not feel, nor will they be safe on a lane next to high-speed traffic. Instead, we believe they will rely on the sidewalk.** I-2-1

Comment Letter I-2 *cont.*

Potential Street Configuration



Potential Class I multi-use path along North Fairview Street

Street Constraint Locations

Pedestrian crossing at Warner Avenue

N Fairview Street experiences high vehicular speeds

I-2-1 cont.

Image: City of Santa Ana Active Transportation Plan

To propose an even better street, we would include the reduction of lane widths to 10 feet in order to limit vehicle speeds and reduce further need to acquire land for the project. 10 ft lanes have been done on other City streets, including on Bristol.

SAAS, multiple community-based organizations and many Santa Ana residents were involved in the development of the Active Transportation Plan and applaud the creative path the city took in working with CBOs in developing this plan from 2018-2019 and to the city council for approving this plan. But what is proposed today ignores the community voices that have already said what they want on Fairview. Instead of coming back to this street after it is dramatically changed, we

Comment Letter I-2 *cont.*

SANTA ANA ACTIVE STREETS

can design the street as proposed in the active transportation plan, again that the city approved, with better infrastructure for cyclists, skaters, folks of all ages and diminish the long term impact on that roadway.

I understand today's proposed project would adhere to OCTA's Master Plan of Arterial Highways, but no mention of the City's Active Transportation Plan is mentioned in the City staff report. When City Council voted for the Active Transportation Plan, it was incorporated into the City's Circulation Element, which we understand has not been fully updated. So the questions rests on whether the City chooses a project that adheres to an outdated general plan or our future general plan and circulation element we hope to be updated in the next year or so. We believe the most recent ideas put forward take precedence, and we support the Fairview project included in the Active Transportation Plan, not what is included in this agenda item today.

If this item moves forward, studies have shown that increasing street widths and speeding up vehicle speeds are the leading contributors to dangerous road conditions. According to the City's Safe Mobility Plan, arterial streets, which Fairview Street is defined as, constitute only 20% of our roadway network, but 60% of all pedestrian-involved collisions and 68% of the collisions involving people on bicycles occur on them. The City's own study also states that the number of lanes in an intersection is associated with an increase in the number of pedestrian and bicycle collisions. **I-2-1 cont.**

If this project is truly about increasing safety we should acknowledge that large intersections and wide streets are and continue to be dangerous for our communities, especially youth, the disabled, and the elderly and we should create designs that put safety in a complete way, forward. And according to city documents like the active transportation plan, they have already been designed, and we hope they have just been overlooked.

I ask the council to direct city staff to adopt what is in the active transportation plan and adhere to what is proposed in that document. We would like to thank the City, for being leaders in a safe active transportation movement in Santa Ana. We welcome a meeting to further discuss Complete Streets and alternative street designs to ensure the safety of all people.

Sincerely,

Kristopher Fortin
Project Director

APPENDIX G

RESPONSE TO COMMENTS

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RESPONSE TO COMMENTS

INTRODUCTION

The purpose of this section is to present public comments and responses to comments received on the Initial Study/Mitigated Negative Declaration (IS/MND) for the Fairview Bridge Replacement and Street Improvements (9th Street to 16th Street) Project (proposed Project). The IS/MND was released for public review and comment by the City of Santa Ana (City) on April 6, 2020.

As required by the California Environmental Quality Act (CEQA) Guidelines Section 15073, a Notice of Availability (NOA) of the Public Review Draft IS/MND was sent to responsible agencies and trustee agencies in addition to various public agencies, citizen groups, and interested individuals concerned with the proposed Project. In addition, the NOA was filed with the Orange County Clerk on April 6, 2020 and with the State Clearinghouse on April 7, 2020. The NOA was also mailed to residents within 500 feet of the Project limits, several agencies, elected officials, utility companies, neighborhood associations, and interested parties. In addition, the NOA was prepared in three languages, including English, Spanish, and Vietnamese. The NOA is included in Appendix E of the IS/MND.

The IS/MND was circulated for public review for a period of 36 days, from April 6, 2020, to May 12, 2020. Due to the COVID-19 outbreak, all City municipal government buildings were closed to the public during the public review period. As such, the Public Review Draft IS/MND and the Project's PowerPoint presentation were available on the City's website. Three comment letters were received during the public review period. Comments were received from OC Public Works, AT&T Transmission TCA, and interested parties. The comment letters are included in Appendix F of the IS/MND.

The City, as the Lead Agency, is required to consider agency and public comments on a mitigated negative declaration. Although preparation of written responses to comments received on an IS/MND is not required by CEQA, responses have been prepared.

This document includes responses to all environmental issues raised in comments received on the IS/MND. Comments submitted on the IS/MND included questions about conclusions identified in the IS/MND, methods used to prepare the technical analyses and findings, and comments about community and regional issues. When comments did not address the completeness or adequacy of the environmental documentation or when they did not raise environmental issues, the receipt of the comment was noted and no further response is provided.

Responses to each of the comment letters are provided on the following pages. The comment index numbers are provided in the upper right corner of each comment letter, and individual points within each letter are numbered along the right-hand margin of each letter. The City's responses to each comment letter are in Table A.1 and are referenced by index numbers in the left-hand column.

On June 18, 2020, the City Council held a duly noticed public hearing to consider all testimonies, written and oral, related to the Final IS/MND and the related Mitigation Monitoring and Reporting Program. Testimonies were heard and have been acknowledged in Table A.1 below.

Table A.1: Response to Comments

Respondent	Comment Number	Comment	Response
LOCAL AGENCIES			
L-1 Richard Vuong, Interim Deputy Director Orange County Public Works Service Area/Orange County Development Services 601 North Ross Street Santa Ana, CA 92701 May 5, 2020	L-1-1	Thank you for the opportunity to comment on the Notice of Availability of Draft Initial Study/Mitigated Negative Declaration for Fairview Bridge Replacements and Street Improvements. The County of Orange offers the following comments for your consideration.	This comment is introductory and introduces ensuing comments. The comment does not contain any substantive statements or questions about the environmental analysis or conclusions contained in the IS/MND or the analysis therein. Therefore, no further response is necessary.
	L-1-2	All work, within or adjacent to any Orange Flood County Flood Control District (OCFCD) right-of-way for flood control facilities, shall be conducted so as not to adversely impact a channel's conveyance, capacity, structural integrity, hydraulic flow conditions, access and maintainability. Furthermore, all proposed projects within OCFCD's right-of-way should be reviewed and approved by OC Public Works, and the work should be conducted only after an encroachment permit has been obtained. For information regarding the permit application process and other details, please refer to the Encroachment Permits Section link on OC Public Works' website http://www.ocpublicworks.com/ds/permits/encroachment_permits	The City will obtain an encroachment permit from the County prior to commencement of construction. Section 1.0 Project Description, Item #10 (page 1-13) of the IS/MND, identifies the need for an encroachment permit from the County.
	L-1-3	It is acknowledged in the Draft Initial Study/Mitigated Negative Declaration provided a River Hydraulics Analysis as an appendix. However, the information provided was not detailed enough to confirm that the proposed project has minimal affects to the Santa Ana River. Detailed technical reviews and approvals for the proposed work will be accomplished within the permit process described above. In addition, all hydrologic and hydraulic studies must conform to the current guidelines and criteria as specified in the Orange County Hydrology Manual (OCHM), Addendum No.1 to the OCHM, and the Orange County Flood Control Design Manual. Submitted reports should contain the necessary calculations and supporting files, computer models, exhibits,	As identified above, the City will obtain an encroachment permit from the County prior to commencement of construction. The City will provide the appropriate hydraulic calculations as part of the encroachment permit.

Table A.1: Response to Comments

Respondent	Comment Number	Comment	Response
		maps, tables, and any other information necessary to enable a complete review.	
	L-1-4	Please revise Section 1.0 Project Information, Item #10 (page 1-13), to read: "United States Army Corps of Engineers (USACE): Compliance with the Nationwide Permit Program Under Section 404 Clean Water Act and Section 408 (Section 14 of the Rivers and Harbors Act of 1899, 33 USC 408)."	This comment requests a revision to Section 1.0 Project Description, Item #10 (page 1-13) to include "(Section 14 of the Rivers and Harbors Act of 1899, 33 USC 408)" and remove "of the Clean Water Act". The referenced text has been revised. See Chapter 4.0 (Corrections and Additions) of this document.
	L-1-5	If you have any questions regarding these comments, please contact Alison Camara at (714) 647-3961 in OC Flood Programs or Steven Giang at (714) 667-8816 in OC Development Services.	This comment in conclusory and provides contact information for future correspondence. The comment does not contain any substantive statements or questions about the environmental analysis or conclusions contained in the IS/MND or the analysis therein. Therefore, no further response is necessary.
UTILITIES			
U-1 Maria Guzman AT&T Transmission TCA 420 S. Grand Ave, Room 707 Los Angeles, CA 90071 May 7, 2020	U-1-1	This response is for "AT&T–TCA" only. Name change from TCG (Teleport Communications Group) to TCA (Teleport Communications America, LLC) - Effective date of the merger is January 1, 2013	This comment is introductory and introduces ensuing comments. The comment does not contain any substantive statements or questions about the environmental analysis or conclusions contained in the IS/MND or the analysis therein. Therefore, no further response is necessary.
	U-1-2	There are no aerial or underground fiber facilities owned by AT&T-TCA within the project location.	This comment states that there are no AT&T-TCA facilities within the Project location. The comment provided does not comment on the environmental analysis or conclusions contained in the IS/MND or the analysis therein. Therefore, no further response is necessary.

Table A.1: Response to Comments

Respondent	Comment Number	Comment	Response
INTERESTED PARTIES			
I-1 Luciano Rodriquez, Ph. D. E-mail: chanorodrig@gmail.com May 6, 2020	I-1-1	I am glad that congestion will be lessen from the Fairview Street Improvements project. I only have one concern that I have mentioned in other meets in regards to the exit of West 9th St. During congestion, one cannot exist appropriately for two reasons: 1) When existing 9th St (East direction) by making a right turn (South Fairview), traffic is not friendly to give one a chance to make the turn. 2) When existing 9th St and making a left turn (North Fairview), again traffic is not friendly. Furthermore, during non-congestion hours, making a left turn is difficult due to the hidden curve, and of course, one can make a right turn and make a U-Turn on the light of Civic Center and Fairview. Is there something that the city can do to alleviate the issue, now that there will be construction very close by? Perhaps, placing a street light to allow residents of 9th St. to exist and enter safely? Or removing the center divider and allowing people making a left turn to be in the middle lane to merge? Or at least place the wording on the pavement "Keep Clear"? Thank you for your time and looking at the neighbored concerns,	This comment identifies safety concerns about turning onto Fairview Street from 9th Street. The proposed Project includes widening Fairview Street from two lanes in each direction to three lanes in each direction between 9th Street and 16th Street. The Fairview Street segment between 9th Street and 16th Street is the only constraint for Fairview Street to be built out to its planned width of six lanes. This condition causes a traffic "bottleneck" during peak hours. Implementation of the proposed Project would improve traffic flow and alleviate congestion in the study area. However, the additional capacity afforded to north-south traffic along Fairview Street will not alleviate, and may increase, anticipated delays to left-turning vehicles entering and exiting the unsignalized streets of 16th Street and 9th Street. Once the Project is completed, vehicles turning in/out of the residential neighborhoods may utilize alternate routes along Fairview Street, such as U-turns at 17th Street and Civic Center Drive, to more conveniently travel to their intended destinations. This potential rerouting of left-turns would affect a modest number of vehicles, less than 10 per peak hour at any one intersection. In addition, the City will stripe the intersection at Fairview Street and 9th Street with "Keep Clear" Paint Markings. As stated in Section 3.17, Transportation, the proposed roadway improvements would be designed and constructed consistent with applicable design standards and would not include hazardous design features or incompatible uses. As discussed in Section 3.17, Transportation, as part of the City's annual Capital Improvement Program (CIP), the City conducts ongoing monitoring and collects citywide traffic data for all arterials and intersections within the City. As

Table A.1: Response to Comments

Respondent	Comment Number	Comment	Response
			part of this ongoing monitoring, the City determines needed improvements and prioritizes projects for funding to address identified congestion and/or safety concerns. In the future, as part of the City's CIP program, the City may determine whether improvements are needed to the intersection of Fairview Street and 9th Street. As stated in Section 3.17, Transportation, a Traffic Management Plan (TMP) shall be prepared during final design and implemented during construction to address impacts to local circulation during construction.
I-2 Kristopher Fortin[1] Project Director Santa Ana Active Streets 450 W 4th St, Santa Ana, CA 92701 June 16, 2020	I-2-1	Concerning the Resolution, we appreciate the need to update the Fairview bridge as it is a safety hazard to all users, but we believe that the proposed design will continue to be unsafe for bicyclists and pedestrians and is not consistent with the City's recently approved Active Transportation Plan. On page 106-107 of the Active Transportation Plan, the street type proposed shows four general-purpose lanes, a center turn lane, a 10-foot multiuse path on the west side of the street, and a 5-foot sidewalk and 5-foot greenway on the east side of the street. This would maintain the street at 82 ft, and that is even with maintaining most general-purpose lanes at 11 ft and one lane at 15 ft. In our initial letter we submitted to the council, we proposed a different street configuration, but what is proposed in the City approved active transportation plan is even better. What is proposed in today's agenda would widen the road to 100 ft and cause the acquisition and demolition of one residential and commercial property. And as we have seen on Bristol Street, users will not feel, nor will they be safe on a lane next to high-speed traffic. Instead, we believe they will rely on the sidewalk. To propose an even better street, we would include the reduction of lane widths to 10 feet in order to limit vehicle	The City is fully committed to improving pedestrian and bicyclist safety, not only along Fairview Street as part of this Project, but throughout the entire City. The proposed Project considers the addition of bike lanes, sidewalks (where missing), speed, volume of traffic, and travel lane widths to create a safer street. The proposed Project is fully compliant with the 2008 Complete Streets Act (Assembly Bill 1358, California Government Code Sections 65040.2 and 65302). The purpose of the Complete Streets Act is to ensure that all users of the transportation system, including pedestrians, bicyclists, and transit users, as well as children, older individuals, and individuals with disabilities, are able to travel safely and conveniently on streets and highways within the public right-of-way. The City is currently in the process of updating their General Plan Circulation Element. The Complete Streets Act requires that the General Plan Circulation Element complies with the complete streets principle of planning for all modes. With completion of the proposed Project, Fairview Street would be consistent with the City's General Plan Circulation Element and, therefore, would comply with the Complete Streets Act. The improvements would also make Fairview Street consistent

Table A.1: Response to Comments

Respondent	Comment Number	Comment	Response
		speeds and reduce further need to acquire land for the project. 10 ft lanes have been done on other City streets, including on Bristol. SAAS, multiple community-based organizations and many Santa Ana residents were involved in the development of the Active Transportation Plan and applaud the creative path the city took in working with CBOs in developing this plan from 2018-2019 and to the city council for approving this plan. But what is proposed today ignores the community voices that have already said what they want on Fairview. Instead of coming back to this street after it is dramatically changed, we can design the street as proposed in the active transportation plan, again that the city approved, with better infrastructure for cyclists, skaters, folks of all ages and diminish the long term impact on that roadway. I understand today's proposed project would adhere to OCTA's Master Plan of Arterial Highways, but no mention of the City's Active Transportation Plan is mentioned in the City staff report. When City Council voted for the Active Transportation Plan, it was incorporated into the City's Circulation Element, which we understand has not been fully updated. So the questions rests on whether the City chooses a project that adheres to an outdated general plan or our future general plan and circulation element we hope to be updated in the next year or so. We believe the most recent ideas put forward take precedence, and we support the Fairview project included in the Active Transportation Plan, not what is included in this agenda item today. If this item moves forward, studies have shown that increasing street widths and speeding up vehicle speeds are the leading contributors to dangerous road conditions. According to the City's Safe Mobility Plan, arterial streets, which Fairview Street is defined as, constitute only 20% of our roadway network, but 60% of all pedestrian-involved	with the County Master Plan of Highways. With regards to the City's approved Active Transportation Plan (ATP), the exhibit shown on page 107 of the ATP shows one of the potential street configurations. However the proposed Project would be consistent with the ATP by introducing a multi-modal corridor where there are currently no sidewalks nor bike lanes on the bridge. Additionally, the proposed features of the proposed Project must meet both City and federal design guidelines as the proposed Project would utilize federal funding. All proposed property acquisitions for the proposed Project are necessary to address the safety concerns due to sight distance at the intersection of Fairview Street and 9th Street. In addition, the City will continue to work with the community and stakeholders to develop aesthetic features within the allowable funding sources' guidelines for the proposed Project throughout the deisgn process.

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		collisions and 68% of the collisions involving people on bicycles occur on them. The City's own study also states that the number of lanes in an intersection is associated with an increase in the number of pedestrian and bicycle collisions. If this project is truly about increasing safety we should acknowledge that large intersections and wide streets are and continue to be dangerous for our communities, especially youth, the disabled, and the elderly and we should create designs that put safety in a complete way, forward. And according to city documents like the active transportation plan, they have already been designed, and we hope they have just been overlooked. I ask the council to direct city staff to adopt what is in the active transportation plan and adhere to what is proposed in that document. We would like to thank the City, for being leaders in a safe active transportation movement in Santa Ana. We welcome a meeting to further discuss Complete Streets and alternative street designs to ensure the safety of all people.	
I-3 Kelly Croachly[2] June 18, 2020	I-3-1	Hi this is Kelly Croachly I am a resident in Santa Ana and I frequently use my bicycle to get around the City and I oppose this because of the comments made by the previous caller that without a protected bike lane it's not going to be any safer and we are going to continue to see accidents involving bicyclists. I actually was with a friend who got hit by a car and it got her back a year in her life she was in the ICU so you really need to take safety seriously and come up with an option that aligns with our active streets proposal that you have approved.	As discussed in Response to Comment I-2-1, the City is fully committed to improving pedestrian and bicyclist safety, not only along Fairview Street as part of this Project, but throughout the entire City. The proposed Project considers the the addition of bike lanes, sidewalks (where missing), speed, volume of traffic, and travel lane widths to create a safer street.

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Respondent	Comment Number	Comment	Response
CITY COUNCIL MEMBERS			
C-1 Councilmember Phil Bacera[3] June 18, 2020	C-1-1	I motion to approve/adopt MND with two conditions that we incorporate a protected bike lanes on both sides northbound and southbound along Fairview and that we do have community input for the design of the aesthetic on the bridge.	As discussed in Response to Comment I-2-1, the City is fully committed to improving pedestrian and bicyclist safety, not only along Fairview Street as part of this Project, but throughout the entire City. The proposed Project considers the addition of bike lanes, sidewalks (where missing), speed, volume of traffic, and travel lane widths to create a safer street. In addition, the City will continue to work with the community and stakeholders to develop aesthetic features within the allowable funding sources' guidelines for the proposed Project throughout the deisgn process.
C-2 Councilmember David Penaloza[3] June 18, 2020	C-2-1	Pay closer attention to the design. We have a city that is 150 years old and made of beautiful architectures throughout the entire city. Would like to bring character to that area of town. Focus on the security barrier between the fast moving cars and the public not only the bikers, but the people walking.	As discussed in Response to Comment I-2-1, the City is fully committed to improving pedestrian and bicyclist safety, not only along Fairview Street as part of this Project, but throughout the entire City. The proposed Project considers the addition of bike lanes, sidewalks (where missing), speed, volume of traffic, and travel lane widths to create a safer street. In addition, the City will continue to work with the community and stakeholders to develop aesthetic features within the allowable funding sources' guidelines for the proposed Project throughout the deisgn process.

Source: LSA Associates, Inc. (June 2020).
[1] Kristopher Fortin called in during the City Council hearing on June 18, 2020 and read the letter.
[2] Kelly Croachly called in during the City Council hearing on June 18, 2020 and provided verbal comments. Kelly Croachly's verbal comments have been incorporated in Table A.1.
[3] Councilmember comments were verbal comments provided during the City Council hearing on June 18, 2020 and have been incorporated in Table A.1.

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