INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION
Town Center Village Phase IV
Infill Apartments Project
El Centro, California

Lead Agency
City of El Centro
Community Development Department
1275 Main Street
El Centro, CA 92243
Contact: Angel Hernandez, Associate Planner

Prepared By
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9755 Clairemont Mesa Boulevard, Suite 100
San Diego, California 92124
Contact: Bob Stark, AICP

April 2021

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1.0 INTRODUCTION

1.1 INTRODUCTION AND REGULATORY GUIDANCE

This document is an Initial Study (IS) with supporting environmental studies, which provides justification for a Mitigated Negative Declaration (MND) pursuant to the California Environmental Quality Act (CEQA) for the Town Center Village Phase IV Infill Apartments Project (project).

The IS/MND is a public document to be used by the City of El Centro (City), acting as the CEQA lead agency, to determine whether the project may have a significant effect on the environment pursuant to CEQA. If the lead agency finds substantial evidence that any aspect of the project, either individually or cumulatively, may have a significant effect on the environment that cannot be mitigated, regardless of whether the overall effect of the project is adverse or beneficial, the lead agency is required to prepare an environmental impact report (EIR), use a previously prepared EIR and supplement that EIR, or prepare a subsequent EIR to analyze the project at hand (Public Resources Code Sections [PRC] 21080(d) and 21082.2(d)).

If the agency finds no substantial evidence that the project or any of its aspects may cause a significant impact on the environment with mitigation, an MND shall be prepared with a written statement describing the reasons why the proposed project, which is not exempt from CEQA, would not have a significant effect on the environment and therefore why it does not require the preparation of an EIR (CEQA Guidelines Section 15371).

According to CEQA Guidelines Section 15070, a Negative Declaration shall be prepared for a project subject to CEQA when either:

1) *The IS shows there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or*
2) *The initial study identifies potentially significant effects, but:*
    a) *Revisions in the project plans or proposals made by, or agreed to by the applicant before the proposed MND and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and*
    b) *There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant effect on the environment.*

This IS/MND has been prepared in accordance with CEQA, PRC Section 21000 et seq., and the CEQA Guidelines Title 14 California Code of Regulations (CCR) Section 15000 et seq.

1.2 LEAD AGENCY

The lead agency is the public agency with primary responsibility over a proposed project. Where two or more public agencies will be involved with a project, CEQA Guidelines Section 15051 provides criteria for identifying the lead agency. In accordance with CEQA Guidelines Section 15051(b)(1), "the lead agency will normally be the agency with general governmental powers." Therefore, based on the criteria described above, the lead agency for the proposed project is the City of El Centro.

1.3 PURPOSE AND DOCUMENT ORGANIZATION

The purpose of this IS/MND is to evaluate the potential environmental impacts of the proposed Town Center Village Phase IV Infill Apartments Project. Mitigation measures have also been established that reduce or eliminate any identified significant and/or potentially significant impacts. This document is presented in the following format:

1.0 Introduction

This section provides an introduction and describes the purpose and organization of this document.

2.0 Project Description

This section provides a detailed description of the proposed project and the environmental setting, and lists the various agency approvals required.

3.0 Environmental Checklist

This section describes the environmental setting for each of the environmental subject areas, as appropriate; evaluates a range of impacts classified as "no impact," "less than significant impact," "less than significant impact with mitigation incorporated," or "potentially significant impact" in response to the environmental checklist; provides mitigation measures, where appropriate, to mitigate potentially significant impacts to a less than significant level; and provides a determination of project impacts.

4.0 Document Preparers and References

This section identifies staff and consultants responsible for preparation of this document. It also lists the resources used in the preparation of this document.

Appendices

The appendices to this report include various technical reports, database records, and modeling printouts that were prepared during the course of the Initial Study.

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2.0 PROJECT DESCRIPTION

2.1 PROJECT CHARACTERISTICS

1. **Project Title:**
   El Centro Town Center Village Phase IV - Infill Apartments Project
2. **Lead Agency Name and Address**
   City of El Centro
   1275 W. Main Street
   El Centro, California 92243
3. **Contact Person**
   Norma M. Villicaña, Director of Community Development
   Phone Number: 760.337.4545
   Email: nvillicana@cityofelcentro.org
4. **Project Location and Size**
   The project site is located in the northernmost portion of the City of El Centro (City) in south-central Imperial County, California. The property site is located between Cruickshank Drive to the north and Bradshaw Avenue to the south, and between N. 8th Street to the east and N. 10th Street to the west. The affected County Assessor Parcel Numbers (APNs) are APNs 044-620-049 and APN 044-620-051. Regional access to the project vicinity is provided via Interstate 8 (I-8) which is located approximately 2.6 miles to the south; refer to Figure 1, Regional/Local Vicinity Map. The site is located within the boundaries of the Town Center Village Project and represents Phase IV of four planned phases of development. Refer to Figure 2, Aerial Photograph.
5. **Project Sponsor's Name and Address:**
   YK America Group
   c/o David Yang, Senior Project Manager
   9680 Flair Drive
   El Monte, California 91731
6. **Existing General Plan Land Use Designation**
   General Commercial
7. **Zoning**
   CG-General Commercial

2.2 PROJECT DESCRIPTION

Existing Setting and Surrounding Land Uses

Regional Setting

As stated, the City of El Centro is located in south-central Imperial County. The City is bordered to the north by the City of Imperial and the communities of Heber and Calexico to the south/southeast. The international United States/Mexico border is located approximately 6.5 miles to the south. The El Centro Naval Air Facility is northwest of the City. Additionally, expansive lands actively utilized for agricultural production surround the City. Regional access to the project site is provided via I-8 to northbound S. 4th Street or S. Imperial Avenue.

Local Setting

The project site lies within an urbanized area of the City, within the boundaries of the planned Town Center Village development. Refer to Figure 2, Aerial Photograph. The subject property has been previously disturbed and, in its current state, is undeveloped bare ground with limited vegetation. The site is relatively flat, with on-site elevations ranging from approximately 51 feet below mean sea level to approximately 39 feet below mean sea level across the property (ECORP 2020b).

Infrastructure improvements were made as part of the prior phases of development of the Town Center Village. N. 10th Street was constructed as a two-lane road running north–south, forming the western property boundary, with curb, gutter, and sidewalk improvements. Bradshaw Avenue was improved between N. 8th Street and N. 12th Street to half-width with curb, gutter, and sidewalk improvements. Street lighting was installed along these roadways, and utilities (water and sewer) were constructed within N. 10th Street.

Surrounding Land Uses

Surrounding land uses include multi-family residential (Town Center Villa Apartments) to the west across N. 10th Street; vacant land adjacent to the north; multi-family residential development to the east, along with vacant land, Union Pacific railroad, and active agricultural fields; and single-family rural residential uses to the south across Bradshaw Avenue. The existing El Centro Town Center commercial retail development is located farther to the west (part of Phase I of the Town Center project) and includes such stores as Target, 99 Cents Only store, and Lowe's Home Improvement, among other commercial uses. Imperial Valley College is located approximately 3.5 miles to the northeast.

The Imperial County Airport is located approximately 1.8 miles northwest of the project site. An existing irrigation canal runs along the east side of N. 8th Street. A regional-serving railway extends northwest to southeast approximately 0.15 mile to the east of the site at its closest point.

The Imperial County Airport Land Use Compatibility Plan (Imperial County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone. The Imperial County Airport Land Use Commission previously reviewed the request to rezone the subject property as proposed and found that the rezone would be inconsistent with the Imperial County Airport Land Use Compatibility Plan. However, the City retains the authority to make a final consistency determination that may ultimately preside over the Airport Land Use Commission's decision as to the appropriateness of the requested rezone.

Proposed Project

The approximately 19.3-acre site is comprised of County APNs 044-620-049 and APN 044-620-051. The project as proposed would result in development of an approximately 11.6-acre portion of the subject property; the remainder of the site is not proposed for development as part of the project and would remain in its current state. The affected area (proposed development footprint) is shown in Figure 3A, Site Plan.

The project would require a General Plan Amendment to change the existing General Plan land use designation on the portion of the site proposed for development from General Commercial to High Density Residential. The project would also rezone the same portion of the property from CG-General Commercial to R3-Multiple Family Residential. The existing General Commercial land use and CG-Commercial zoning would continue to apply to the remainder of the property, which is proposed to be subdivided to allow for future commercial development (not proposed for development at this time); refer to Figure 3B, Proposed Subdivision Map, and discussion under Subdivision Map, below.

Table 1, Project Summary, provides a summary of the proposed improvements.

Table 1: Project Summary

<table>
<tr><th colspan="5">APARTMENT SUMMARY</th></tr>
<tr><th>Unit Plan</th><th>Square Feet</th><th>Bed/Bath</th><th># Units</th><th>Total Square Feet</th></tr>
<tr><td>Unit 1</td><td>643</td><td>1/1</td><td>60</td><td>38,580</td></tr>
<tr><td>Unit 2A</td><td>970</td><td>2/2</td><td>60</td><td>58,200</td></tr>
<tr><td>Unit 2B (2-Story)</td><td>924</td><td>2/2.5</td><td>60</td><td>55,440</td></tr>
<tr><td>TOTAL</td><td>--</td><td>--</td><td>180</td><td>152,220</td></tr>
<tr><th colspan="5">PARKING SUMMARY</th></tr>
<tr><th colspan="2">Required Parking Spaces</th><th colspan="3">Provided Parking Spaces</th></tr>
<tr><td>1 Bedroom; 1.5 space/unit</td><td>90</td><td colspan="2">Private Garages</td><td>60</td></tr>
<tr><td>Bedroom; 2 spaces/unit</td><td>240</td><td colspan="2">Standard Parking Stalls (9'x20')</td><td>280</td></tr>
<tr><td>Guest: 0.25 spaces/unit</td><td>45</td><td colspan="2">Compact Stalls (8.5'x17')</td><td>45</td></tr>
<tr><td>TOTAL</td><td>375</td><td colspan="2">--</td><td>385</td></tr>
<tr><th colspan="5">OPEN SPACE SUMMARY</th></tr>
<tr><th colspan="2">Required Open Space</th><th colspan="3">Provided Open Space</th></tr>
<tr><td rowspan="2">150 SF per unit
common open space
(20' minimum width)</td><td rowspan="2">27,000</td><td colspan="2">Recreation Amenity
(Minus Clubhouse)</td><td>16,710</td></tr>
<tr><td colspan="2">Common Open Space
& Dog Park</td><td>31,430</td></tr>
<tr><td>TOTAL</td><td>27,000</td><td colspan="2">--</td><td>48,140</td></tr>
<tr><th colspan="5">SITE COVERAGE</th></tr>
<tr><th colspan="2">Required Site Coverage</th><th colspan="3">Provided Site Coverage</th></tr>
<tr><th>Standard</th><th>Square Feet</th><th>Coverage Type</th><th>Square Feet</th><th>Percent</th></tr>
<tr><td rowspan="2">Maximum Lot
Coverage = 60%</td><td rowspan="2">302,000 – 304,000</td><td>Building Coverage</td><td>126,900</td><td>25%</td></tr>
<tr><td>Roads and Parking</td><td>169,980</td><td>34%</td></tr>
<tr><td colspan="3">TOTAL</td><td>296,880</td><td>59%</td></tr>
</table>

Multi-Family Residential

The proposed rezoning of a portion of the property to R3-Multiple Family Residential would allow for development of a 180-unit apartment complex at a density of 15.6 dwelling units per acre (du/ac). A mixture of unit types would be provided within 15 individual buildings. Sixty one-bedroom units are proposed of approximately 643 square feet in size with 1 bathroom and of 1 story in height. Two types of 2-bedroom units are proposed. Sixty 2-bedroom units are proposed of approximately 970 square feet in size with 2 bathrooms and of 1 story in height. Sixty 2-bedroom units are proposed of approximately 924 square feet in size with 2.5 bathrooms and of 2 stories in height. Each individual building would offer two 1-bedroom, 1 bath units; two 2-bedroom, 2-bath units; and four 2 bedroom/2.5 bath units.

Open Space/Recreation

Common open space provided on-site would meet the City's requirement of 150 square feet of common space per residential unit for the proposed R3-Multiple Family Residential zone. The development would offer a number of on-site opportunities for both passive and active outdoor recreation. As shown on Figure 3A, Site Plan, a series of common open space areas would be provided adjacent to the majority of the individual buildings on-site for resident use. Additionally, a private dog park is proposed in the eastern portion of the property, adjacent to N. 8th Street. Other recreational amenities for use by residents and their guests would include a clubhouse, a recreational area with an outdoor pool and hot tub, and a barbecue/fire pit with outdoor seating.

Landscaping, Lighting, and Signage

Landscaping would be provided within the on-site parking areas, in the form of common open space, at the dog park, and along the project perimeter. Proposed landscaping would be consistent with City requirements for coverage and plant types, as well as irrigation systems. The use of reclaimed water for landscape irrigation is not proposed as part of the project.

The project would incorporate lighting and signage elements, as necessary, for safety, security, and locational purposes. One monument sign would be provided at the main entrance along N. 8th Street; no signs are proposed at the entrances along N. 10th Street. Street lighting has been installed along N. 8th Street, N. 10th Street, and Bradshaw Avenue. Interior lighting within the surface parking areas and at the clubhouse facilities would also be provided for purposes of public safety and circulation. All ancillary features would comply with applicable City design standards and nighttime lighting regulations.

Access/Circulation

Main access to the project site would be provided along the eastern boundary from N. 8th Street; refer to Figure 3A, Site Plan. This access would be gated to prohibit entry by the general public. Direct access to the project site would also be provided along the western boundary from N. 10th Street in the northern portion of the site; this access drive would be for egress only. A secondary access point is also proposed from N. 10th Street at approximately the mid-point of the property; this access point would be a two-way drive. Both N. 10th St. access drives would be gated to prohibit entry by the general public. The southern access drive would be set back a distance into the property to ensure that queuing along N. 10th Street does not occur while residents wait for the gate to open when accessing the development.

Internal circulation would be provided via a series of linked internal drives. Drive aisles would be a minimum of 24 feet in width (with provision of adequate turning radii), consistent with City and fire department design requirements to ensure adequate on-site circulation and access for emergency vehicles; refer to Figure 3A, Site Plan.

Parking

Parking for the project would be provided via a combination of private garages and on-site surface parking spaces. In conformance with parking requirements for the proposed R3-Multiple Family Residential zone, a total of 385 on-site parking spaces would be provided; refer to Figure 3A, Site Plan. Sixty private garages are proposed in addition to 280 standard parking stalls and 45 compact parking stalls. Overhead shading structures would also be provided for a number of the surface parking spaces.

Utilities

Water

Water for the project would be supplied by the City's public water system. The City receives its water supply from the Imperial Irrigation District (IID). The project would connect to an existing 12-inch water line in N. 10^{th} Street. No upgrades to the existing public water infrastructure system are required or proposed to serve the project as designed.

Sewer

Wastewater treatment for the project would be provided by the City's existing sewer system. The project would connect to an existing 36-inch sewer line in N. 10^{th} Street. All of the City's wastewater is routed to and treated at the City's Wastewater Treatment Plant located at 2255 North La Brucherie, approximately 0.9 miles northwest of the project site. No upgrades to the existing public sewer infrastructure system are required or proposed to serve the project as designed.

Stormwater Facilities

Stormwater from the project site would be routed to an existing storm drain located in N. 10th Street. This storm drain outlets to an existing off-site detention basin, located north of the project site at the southwest corner of the intersection of N. 8th Street and Treshill Road. This detention basin was previously constructed as part of the El Centro Town Center Village project and was sized to accommodate all planned development within the Town Center Village. Therefore, no upgrades to the City's storm drain system would be required to accommodate stormwater runoff from the subject site with project implementation. Best management practices (BMPs) would be implemented during the construction and operational phases to ensure that stormwater quality leaving the site is maintained and that no adverse effects to off-site properties or downstream waterbodies would occur.

Electricity and Natural Gas

Electrical and gas lines are present in the project vicinity along adjacent local roadways. The project would tie into these existing services. No additional transmission lines or system upgrades would be necessary to convey electricity or natural gas to the site.

Sustainability/Energy Saving Measures

The project would be designed to meet the requirements of the 2019 California Green Building Code. Energy-saving measures incorporated into the project design are anticipated to include such features as low-flow fixtures (i.e., faucets, showers, and toilets) in individual units and the clubhouse. Additionally, 60 charging stations for electric vehicles (EV) would be provided on-site for use by residents.

General Plan Land Use and Zoning

The project as proposed would require a General Plan Amendment to change the existing General Plan land use designation on a portion of the site from General Commercial to High Density Residential. The project site is currently zoned CG-General Commercial; the project proposes to rezone a portion of the property from CG to R3-Multiple Family Residential. The General Plan Amendment and rezone would allow for the on-site residential uses as proposed. As stated, the balance of the property would remain under the current General Plan land use and zoning designations to allow for future commercial development (not proposed for development at this time); see discussion under Subdivision Map, below.

Subdivision Map

As part of the mapping actions associated with the project, the applicant proposes a lot line adjustment (Lot Line Adjustment No. 20-01) and recordation of a subdivision map to divide the original parcel map Lot 4 (APN 044-620-049) and Remainder Lot (APN 044-620-051) into eight lots to allow for anticipated future development. Lot 4 (APN 044-620-049) with a total of approximately 11.59 acres is proposed to be rezoned to R3-Multiple Family Residential and would be divided into three lots ranging from approximately 3.29 acres to 4.16 acres. The Remainder Lot (APN 044-620-051), totaling approximately 7.74 acres, would remain as commercial use and would be divided into five lots ranging from approximately 0.98 acres to 2.85 acres. Refer to Figure 3A, Site Plan, and Figure 3B, Proposed Subdivision Map. No development is proposed on the Remainder Lot (APN 044-620-051) at this time as part of the project.

2.3 PROJECT CONSTRUCTION

Grading and Site Preparation

As the subject site is fairly level, project grading is expected to be minor; no mass grading is required or proposed. Grading would occur over a period of approximately 12 months and would require approximately 14,000 cubic yards (c.y.) of cut and 23,000 c.y. of fill. Therefore, an estimated 9,000 c.y. of soils would be imported to the site for use.

Schedule

Project construction would occur over a period of approximately 19 months from initial grading through final construction. It is anticipated that the work would be completed in 8- or 10-hour shifts, with a total of five shifts per week (Monday-Friday). Overtime and weekend work may occur as necessary to meet scheduled milestones or accelerate the schedule and would comply with all applicable California labor laws as well as local City regulations regulating construction activities.

Operational Characteristics

The project would result in development of multi-family residential uses on-site. All parking demands would be accommodated on-site; it is not anticipated that any off-site parking would occur that may affect surrounding streets. As stated, the access points to the project site would be gated for security purposes and would be accessed via keypad.

Operation of the dog park would occur during daylight hours; no nighttime lighting is proposed for this use. The clubhouse, pool, and barbecue/fire pit would generally operate during daylight/evening hours. Limited exterior lighting would be provided in this area for purposes of safety and circulation.

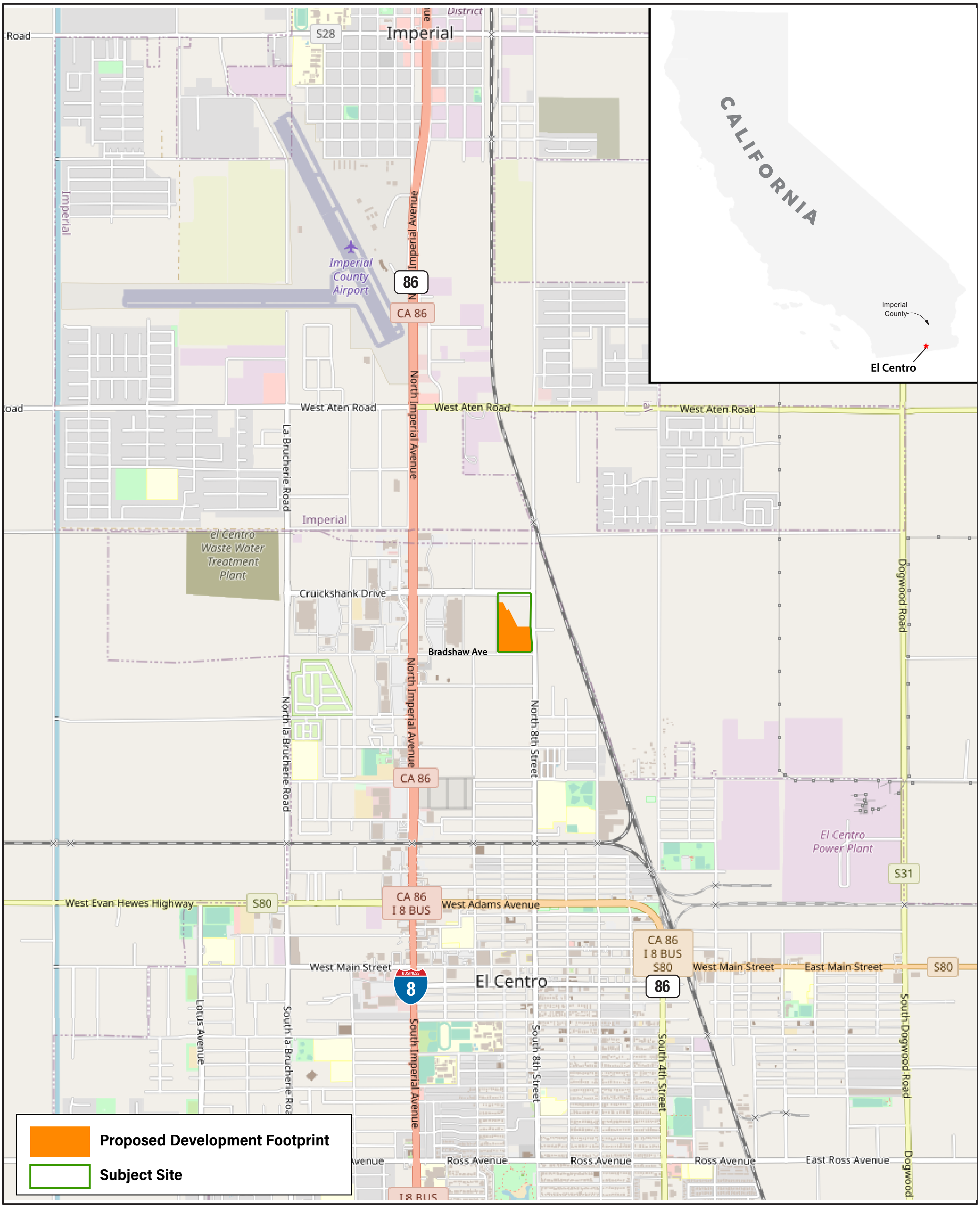
2.4 ANTICIPATED DISCRETIONARY ACTIONS AND APPROVALS

Listed below are public agencies, including the City of El Centro, that may have discretionary actions associated with the implementation of the proposed project:

Project entitlements/discretionary actions and approvals required for the project are anticipated to include, but may not be limited to, those identified in Table 2, Required Approvals and Permits.

Table 2: Required Approvals and Permits

Permit/Action Required	Approving Agency	Lead/Trustee/Responsible Agency
Site Plan	City	Lead Agency
Lot Line Adjustment	City	Leas Agency
Subdivision Map	City	Lead Agency
Landscape Plan	City	Lead Agency
Mitigated Negative Declaration	City	Lead Agency
General Plan Amendment	City	Lead Agency
Rezone	City	Lead Agency
General Construction Stormwater Permit	Colorado River Regional Water Quality Control Board (RWQCB)	Responsible Agency
National Pollution Discharge Elimination System (NPDES) Permit	Colorado River RWQCB	Responsible Agency
Construction Permit and/or Encroachment Permit	City	Lead Agency
Stormwater Quality Management Plan/Drainage Plan	City	Lead Agency
Grading Permit	City	Lead Agency
Building Permit	City	Lead Agency
Improvement Plans	City	Lead Agency
Consistency Determination (Override) – Imperial County Airport Land Use Compatibility Plan	City	Lead Agency
Permit to Construct	Imperial County Air Pollution District	Responsible Agency



Michael Baker INTERNATIONAL

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TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Regional/Local Vicinity Map

Figure 1

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Michael Baker INTERNATIONAL

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Source: ECORP Consulting, 2020; NAIP, 2018; Service Layer Credits: Copyright: (C) 2013 National Geographic Society, i-cubed; Map Date 10/7/2020

TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Aerial Photograph

Figure 2

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PROJECT SUMMARY TABLE

SITE AREA*	**11.56 ACRES**
TOTAL UNITS	**180 UNITS**
DENSITY	**15.6 DU/AC**

* Includes area in Zone 4 with parking and project amenities.

APARTMENT SUMMARY

UNIT PLAN	SQ. FT.*	BD/BA	# UNITS	TOTAL S.F.
UNIT 1	643	1/1	60	38,580
UNITS 2A	970	2/2	60	58,200
UNIT 2B (2-STORY)	924	2/2.5	60	55,440
TOTAL			**180**	**152,220**

*S.F. does not include patio or w/h closet.

PARKING SUMMARY

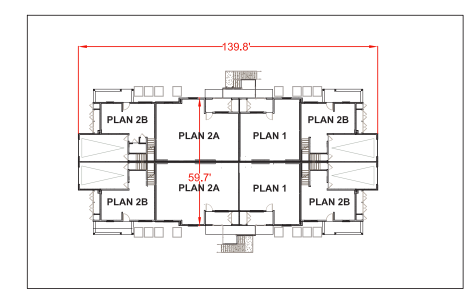
REQUIRED		PROVIDED	
1 BDRM: 1.5 space/unit	90	PRIVATE GARAGES	60
2 BDRM: 2 spaces/unit	240	STANDARD PARKING STALLS (9' X 20')	280
GUEST: 0.25 / UNIT	45	COMPACT STALLS (8.5' X 17')	45
TOTAL	**375**		**385**

OPEN SPACE SUMMARY

REQUIRED		PROVIDED	
150 S.F. PER UNIT COMMON OPEN SPACE (20' MIN. DIM.)	27,000	RECREATION AMENITY (MINUS CLUBHOUSE)	16,710
		COMMON OPEN SPACE & DOG PARK	31,430
TOTAL	**27,000**		**48,140**

SITE COVERAGE

REQUIRED		PROVIDED		
STANDARD	S.F.	COVERAGE TYPE	S.F.	%
MAXIMUM LOT COVERAGE = 60%	302,000-304,000	BUILDING COVERAGE	126,900	25%
		ROADS & PARKING	169,980	34%
TOTAL			**296,880**	**59%**



TYPICAL BUILDING "A"

Michael Baker INTERNATIONAL

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Not to Scale

Source: Danielian Associates, 08/27/2019

TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Site Plan

Figure 3A

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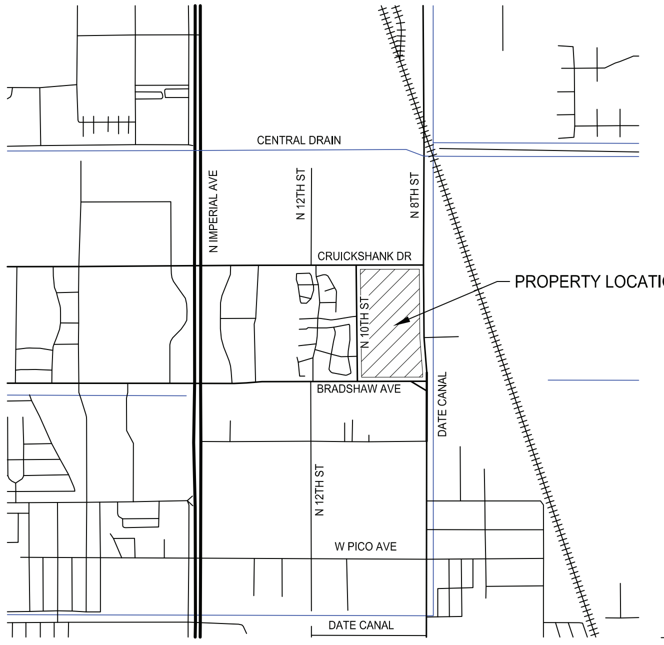
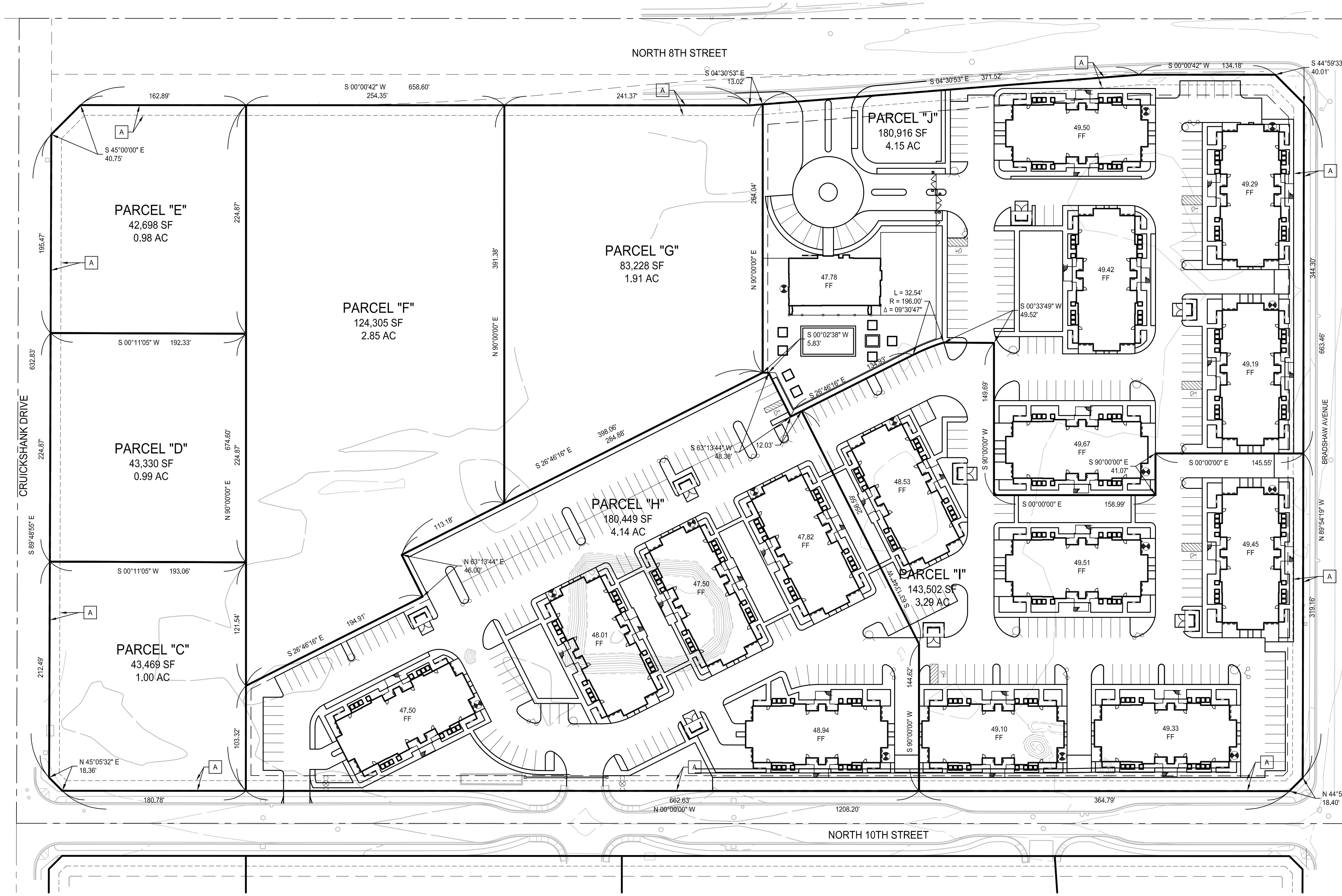


VICINITY MAP
N.T.S.



PROJECT INFORMATION

PROPERTY INFORMATION	
PROPERTY ADDRESS	EL CENTRO, CA 92243
PROPERTY OWNER	TOWN CENTER VILLAGE, LLC 9680 FLAIR DRIVE EL MONTE, CA 91731
ASSESSORS ID NUMBER(S)	044-620-049 AND 044-620-051
LEGAL DESCRIPTIONS	PARCEL "A" LOT 4 AND A PORTION OF THE REMAINDER LOT AS SHOWN ON THE TOWN CENTER VILLAGE APARTMENTS SUBDIVISION MAP, IN THE CITY OF EL CENTRO, COUNTY OF IMPERIAL, STATE OF CALIFORNIA, RECORDED IN BOOK 27, PAGES 16 THROUGH 17 OF FINAL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY. PARCEL "B" A PORTION OF THE REMAINDER LOT AS SHOWN ON THE TOWN CENTER VILLAGE APARTMENTS SUBDIVISION MAP, IN THE CITY OF EL CENTRO, COUNTY OF IMPERIAL, STATE OF CALIFORNIA, RECORDED IN BOOK 27, PAGES 16 THROUGH 17 OF FINAL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY.
PROPERTY ZONING	CG - GENERAL COMMERCIAL
EXISTING LAND USE	VACANT
PROPOSED LAND USE	RESIDENTIAL
DEVELOPMENT AREA	11.59 ACRES
EXISTING TREES	THERE ARE NO EXISTING TREES ON THE SITE
EXISTING STRUCTURES	THERE ARE NO EXISTING STRUCTURES ON THE SITE
DATE MAP PREPARED	FEBRUARY 2021
LINEAR STREET FOOTAGE TOTAL	2250± FT
FLOOD ZONE	ZONE X, ACCORDING TO FEMA FLOOD MAP NO. 06025C1725C

EASEMENTS

A PUBLIC UTILITY EASEMENT PER TOWN CENTER VILLAGE APARTMENTS SUBDIVISION MAP RECORDED IN BOOK 27, PAGES 16 THROUGH 17 OF FINAL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY.

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE NORTHERLY LINE OF REMAINDER PARCELS A AND B AS SHOWN ON THE MAP TITLED "EL CENTRO TOWN CENTER" FILED IN BOOK 20, PAGE 87 OF FINAL MAPS IN THE OFFICE OF THE COUNTY RECORDER OF IMPERIAL COUNTY, SHOWN AS S 89°57'57" E.

UTILITY PROVIDERS:

ELECTRICITY
IMPERIAL IRRIGATION DISTRICT
1285 BROADWAY
EL CENTRO, CA 92243
760-335-3640

GAS
SOUTHERN CALIFORNIA GAS COMPANY
PO BOX 1626
MONTEREY PARK, CA 91754-8626
1-877-238-0092

WATER
CITY OF EL CENTRO
1275 MAIN STREET
EL CENTRO, CA 92243
760-337-4510

SEWER
CITY OF EL CENTRO
2255 NORTH LA BRUCHERIE
EL CENTRO, CA 92243
760-337-4562

BUILDING AND SAFETY DIVISION
CITY OF EL CENTRO
1275 MAIN STREET
EL CENTRO, CA 92243
760-337-4508

50 25 0 50

TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Proposed Subdivision Map

Figure 3B

Michael Baker INTERNATIONAL

File: 180263Figures.indd

Source: Incledon Consulting Group, 3/9/2021

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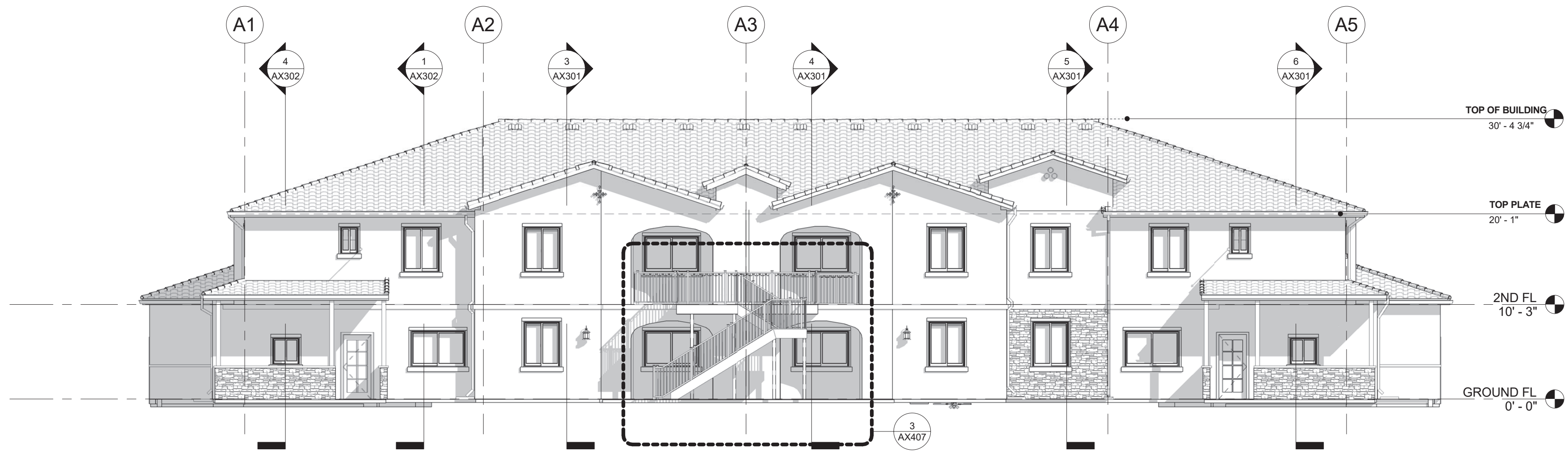
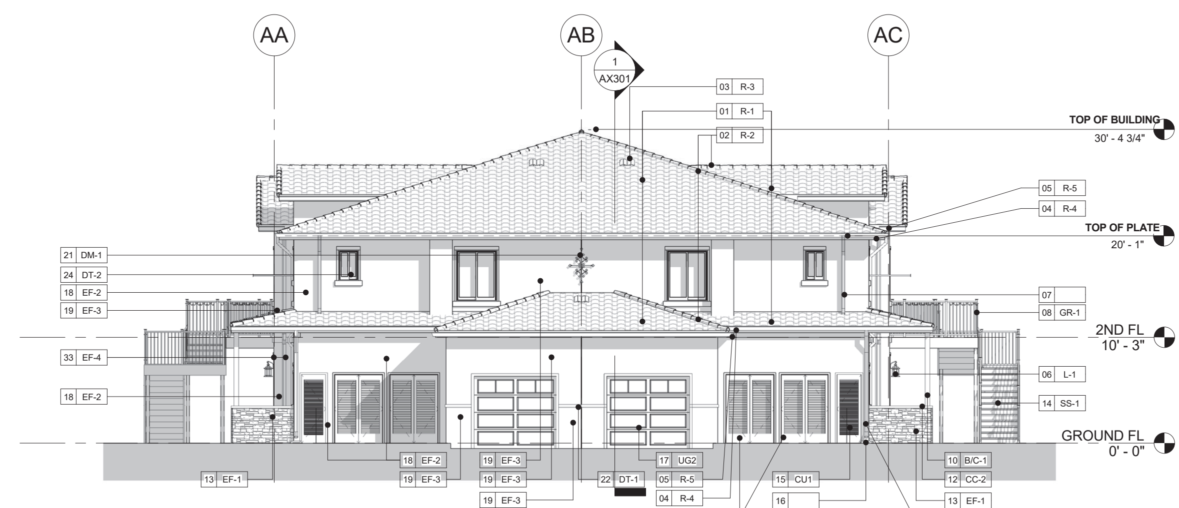
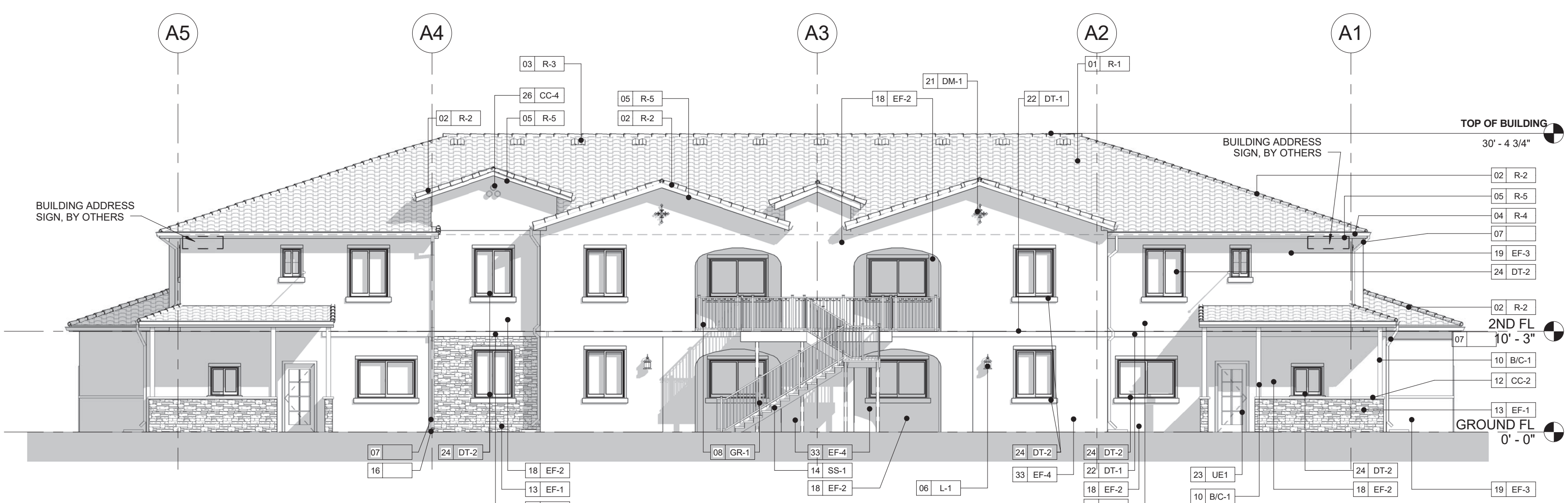


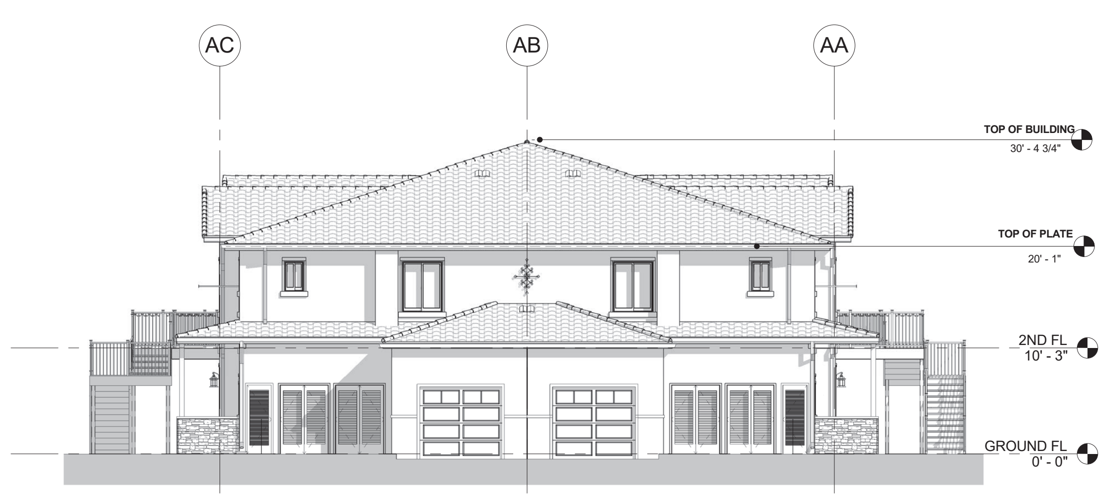
1 REAR ELEVATION



2 RIGHT ELEVATION



3 FRONT ELEVATION



4 LEFT ELEVATION

ELEVATION NOTES

NOTE:
AT LOCATIONS WHERE WALL SURFACES OF WOOD SUBSTRATE TO CONCRETE SUBSTRATE ARE SHOWN, FINISHES ARE TO BE FLUSH. PLASTER FINISHES WILL BE INSTALLED OVER CONCRETE OR C.M.U. SUBSTRATE IN THE NUMBER OF COATS AS REQUIRED TO MAINTAIN FLUSH FINISHED SURFACES.

1. ALL VERTICAL DIMENSIONS SHOWN ARE FROM THE TOP OF PLYWOOD SHEATHING AT UPPER FLOORS OR FINISH SLAB AT FIRST FLOOR.

2. REFER TO DETAIL SHEETS FOR MINIMUM WINDOW, DOOR & WALL VENT MOISTURE BARRIER INSTALLATION REQUIREMENTS.

WOOD SUBSTRATE:

3. WINDOW HEADS WILL BE SET AT EITHER 7' - 11 1/2" OR 8' - 5 1/2" A.F.F. SEE ELEVATIONS

4. ALL HORIZONTAL PLASTER SURFACES SHALL RECEIVE SELF-ADHERED FLASHING, WEATHERBOARD LAPPED WITH BUILDING PAPER PRIOR TO THE APPLICATION OF WIRE LATH & PLASTER. WEATHER BOARD LAP WITH BLDG. PAPER MIN. 2" LAP.

5. CONNECT ALL BUILDING RAIN GUTTER DOWNSPOUTS TO SUSMP BIOFILTER DRAINAGE SYSTEM. REFER TO CIVIL PLANS. ALL OVERFLOW DRAINS TO HAVE A PRE-CAST CONCRETE SPLASH BLOCK.

6. REFER TO DETAIL SHEETS FOR MINIMUM WALL VENT FLASHING INSTALLATION (I.E. DRYER VENT, FOUNDATION VENT, COMBUSTION AIR VENT, ETC.).

7. REFER TO DOOR SCHEDULE FOR HEAD JAMB & THRESHOLD DETAILS NOT HEREWITH SHOWN.

8. INSTALL EXTERIOR PLASTER PER 2013 CBC TABLE 720.1 (2), ITEM #

9. PLASTER REGLET WHERE SHOWN ON ELEVATIONS WILL MITER @ CORNERS & RETURN ON SIDES OF COLUMNS OR WALLS.

10. ALL EXTERIOR WALLS ARE SOLID SHEATHED W/ EXTERIOR GRADE PLYWOOD SAME THICKNESS AS EXTERIOR SHEAR WALLS. REFER TO STRUCTURAL PLANS FOR SHEAR WALL LOCATIONS.

11. METAL CONTROL JOINTS (C.J.) SHALL BE PROVIDED FOR EVERY 150 S.F. OF STUCCO WALL AREA, EQUALLY DIVIDING A WALL PLANE, UNLESS NOTED OTHERWISE.

12. ALL DOUBLE TOP PLATE HEIGHT DIMENSIONS ARE FROM TOP OF INTERIOR FLOOR PLYWOOD SHEATHING.

13. ANTI-GRAFFITI FINISH TO BE PROVIDED AT THE FIRST 9 FEET, MEASURED FROM GRADE, AT EXTERIOR WALLS AND DOORS.

14. PROVIDE ADDRESS SIGNAGE ADJACENT TO UNIT ENTRY DOORS, SEE 6/AX509

EXTERIOR MATERIAL / FINISH SCHEDULE

KEYNOTE	MARK	DESCRIPTION	MNF COLOR	FINISH
	ET-1 & ET-2	DECORATIVE EXT. CERAMIC TILE, SEE DETAIL 3/AX509	FLOR SEVILLANA / TERRA COTTA PEACOCK	PRE-FINISHED
01	R-1	LIGHTWEIGHT CONC. ROOF S-TILE	SANTA CRUZ BLEND	INTEGRAL FINISH
02	R-2	LIGHTWEIGHT CONC. RIDGE, HIP AND EDGE TRIM	MATCH ROOF TILE BLEND	INTEGRAL FINISH
03	R-3	METAL ROOF VENT FOR S-TILE, SEE DETAIL 21/AX509	MATCH ROOF TILE	PRE-FINISHED
04	R-4	METAL ROOF GUTTER	MATCH ADJ. TRIM COLOR	PRE-FINISHED
05	R-5	CONC. FIBER BOARD FACIA	CHOCOLATE CANDY BROWN	PAINTED
06	L-1	DECORATIVE EXT. LED LIGHT FIXTURE, SEE DETAIL 4/AX509	BLACK	PRE-FINISHED
07		METAL DOWNSPOUT		PRE-FINISHED
08	GR-1	DECORATIVE MTL. GUARD RAIL, 42" MIN.HT. FROM F.F.	BLACK	PRE-FINISHED
10	B/C-1	STRUCTURAL COLUMN/BEAM CLAD IN FINISHED WOOD TRIM	SMOOTH-COAT / MATCH 'CHOCOLATE CANDY BROWN'	SMOOTH COAT
11	CC-1	CONC. PARAPET CAP	MATCH VENEER	INTEGRAL FINISH
12	CC-2	CONC. TRIM CAP	MATCH VENEER	INTEGRAL FINISH
13	EF-1	CORONADO - OLD COUNTRY LEDGE	COASTAL BROWN	INTEGRAL FINISH
14	SS-1	METAL STAIRS AND MTL. SUPPORTS W/ CONC. STEPS AND LANDING	CAFE BROWN	PRE-FINISHED
15	CU1	LOUVERED HOLLOW MTL. EXT. DOOR	CHOCOLATE CANDY BROWN	PAINTED / SEMI-GLOSS
16		CONC. SPLASH BLOCK, SEE DETAIL 15/AX510		-
17	UG2	ROLL-UP MTL. GARAGE DOOR W/ GL. WINDOW INSERTS	CHOCOLATE	INTEGRAL FINISH
18	EF-2	EXTERIOR CEMENT PLASTER	VANILLA CREAM	SMOOTH COAT
19	EF-3	EXTERIOR CEMENT PLASTER	EGYPTIAN SAND	SMOOTH COAT
21	DM-1	DECORATIVE WROUGHT IRON MEDALLION, SEE DETAIL 14/AX509	BLACK	PRE-FINISHED
22	DT-1	EXTERIOR CEMENT PLASTER OVER 2x4 WOOD BLOCKING	EGYPTIAN SAND	SMOOTH FINISH
23	UE1	FIBERGLASS FULL VIEW DOOR	MAHOGANY	INTEGRAL FINISH
24	DT-2	MILGARD VINYL SLIDER WINDOW W/ EXTERIOR CEMENT PLASTER TRIM	CHOCOLATE	INTEGRAL FINISH
25	CC-3	CONC. EDGE TRIM	MATCH VENEER	INTEGRAL FINISH
26	CC-4	LIGHTWEIGHT CONC. ACCENT, FAUX GABLE VENT (SEE DETAIL 5/AX509)	MATCH ROOF BLEND	INTEGRAL FINISH
27	DM-2	DECORATIVE WROUGHT IRON GRILLE, SEE DETAIL 14/AX509	BLACK	PRE-FINISHED
33	EF-4	EXTERIOR CEMENT PLASTER	BISON BEIGE	SMOOTH COAT

LEGEND

00 | XX-00 — MATERIAL / COLOR MARK
KEYNOTE

TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Building Type A - Exterior Elevations

Figure 3C

Michael Baker INTERNATIONAL

File: 180263Figures.indd

Source: TSA Architects

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Photo 1: View looking north from central portion of the site.

Photo 2: View looking south from central portion of the site.

Photo 3: View looking west from eastern portion of the site.

Photo 4: View looking north from eastern portion of the site.

TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Site Photographs

Figure 4A

Michael Baker INTERNATIONAL

File: 180263Figures.indd

Source: ECORP Consulting, 2020

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Photo 5: View of lot/residence located south of the project site.

Photo 6: Apartment complex located directly west of the project site.

Photo 7: Date Canal located east of the project site (looking north).

Photo 8: Disturbed lot located directly east of the project site.

TOWN CENTER VILLAGE PHASE IV
INFILL APARTMENT PROJECT

Site Photographs

Figure 4B

Michael Baker INTERNATIONAL

File: 180263Figures.indd

Source: ECORP Consulting, 2020

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3.0 ENVIRONMENTAL CHECKLIST

3.1 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 on the following pages.

☐ Aesthetics	☐ Agriculture and 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

3.2 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 of the incorporated mitigation measures and 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 EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Norma M. Villicaña	4/12/21
Signature	Date
Norma Villicaña	Community Development Director
Printed Name	Title

3.3 EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources cited. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards.

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect, and construction as well as operational impacts.

3) A "Less Than Significant Impact" applies when the proposed project would not result in a substantial and adverse change in the environment. This impact level does not require mitigation measures.

4) "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

5) "Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact." The initial study must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level.

1. Aesthetics

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
1. AESTHETICS. 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 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) *Would the project have a substantial adverse effect on a scenic vista?* ***Less than Significant Impact.***

Figures 4A and 4B show views of the project site and the surrounding area. Scenic vistas include natural features such as topography, watercourses, rock outcrops, natural vegetation, and man-made alterations to the landscape. There are no such designated scenic vistas in the City of El Centro. The site is located in a generally developed area of the City, with a large commercial retail center and similar multi-family development (apartments) to the west; single-family residences to the south; and vacant graded land to the north and east. The site is generally flat and does not support any scenic resources or features, including waterways, rock outcroppings, or other natural features, nor does it offer any scenic views to off-site points of visual interest. As such, project implementation would have a less than significant impact on a scenic vista.

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.***

Refer also to Response 1(a), above. The project site is not located within a scenic corridor, nor are there any designated scenic highways located within the City of El Centro. No scenic resources, such as trees, rock outcroppings, or historic buildings are located on-site. As the project site is not located in the vicinity of a designated scenic highway, project implementation would have no impact to scenic resources within a state scenic highway.

c) *In urbanized areas, would the project conflict with applicable zoning and other regulations governing scenic quality?* ***Less than Significant Impact.***

The project would be designed in accordance with the El Centro Municipal Code to ensure that development reflects required design requirements such as for building size and height, setbacks, provision of landscaping, and common open space, among other such design features. Figure 3C provides illustrative elevations of the proposed buildings. Development occurring with the project would also be required to be consistent with the City's adopted Design Standards, which encourage sound site development practices synonymous with that of the existing residential development surrounding the project. Additionally, the proposed buildings would be similar in design to the existing apartment complex located immediately to the west (Town Center Villa Apartments – Phases I to III) of the project site, and would therefore not substantially change the existing character of the area.

Furthermore, the project site is not located in one of the City's designated Visual Enhancement Areas, as identified in the City General Plan Land Use Element (City of El Centro 2004). The project site is currently undeveloped, previously graded land in proximity to other existing multi- and single-family residential uses and area commercial uses, as well as some undeveloped lands. As discussed under Response 1(b) above, development of the proposed residential uses would not substantially damage any resources having scenic quality, as the site does not support any such features.

Given that implementation of the proposed project would be required to comply with the City's adopted Zoning Code and Design Standards, impacts would be less than significant.

d) *Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?* ***Less than Significant Impact.***

Development of the proposed residential uses on the currently undeveloped site would result in the introduction of new nighttime lighting sources and/or potential sources of glare in the area. As the subject property is undeveloped in the current state, nighttime lighting levels on the project site would increase over current levels with the proposed development and could result in adverse effects to adjacent land uses (particularly single-family residential uses south across Bradshaw Avenue) through the "spilling over" of light or through "sky glow" conditions wherein light escapes from lighting fixtures and projects upward into the dark sky.

Exterior lighting would be installed on the individual buildings for identification purposes (i.e., addresses or building numbers) and access. Lighting would also be installed at the access drives and in the surface parking areas to ensure safe circulation, as well as at the clubhouse/pool area. Additional accent lighting may be used to illuminate the monument sign and associated landscaping at the N. 8th Street entrance. All project lighting would be low-level lighting shielded and directed downward to reduce potential effects on adjacent properties as well as nighttime skies. All new development in El Centro is required to meet the standards identified in Section 29-149, Lighting Standards, of the City's Zoning Code to ensure that potential adverse nighttime lighting effects are minimized.

Additionally, the project as designed does not include the incorporation of large expanses of glass or other reflective materials such as high gloss paints, metallic surfaces, or other such features; refer to Figure 3C. Therefore, it is not anticipated that project elements would result in potential adverse glare effects on surrounding properties (or on operations associated with the Imperial County Airport located approximately 1.8 miles northwest of the project site).

Therefore, the project would not create a new source of substantial light or glare that could potentially adversely affect day or nighttime views in the area. Project impacts associated with light and glare would be less than significant.

2. Agriculture and Forestry Resources

	Potentially Significant Impact	Less Than Significant Impact With Mitigation	Less Than Significant Impact	No Impact
2. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation (DOC) as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB). Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Important Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, or other agricultural resources, 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, forestland (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 forestland or conversion of forestland 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

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? ***Less than Significant Impact.***

According to available maps published by the California Department of Conservation (DOC 2018c) as part of the Farmland Mapping and Monitoring Program (FMMP), the project site is designated Farmland of Local Importance, which is land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee (DOC 2019). Adjoining lands to the west and south are designated as Urban and Built-Up Lands; adjoining lands to the east and north are designated as Farmland of Local Importance (DOC 2018c).

The project site is located in an urbanized area in the City of El Centro and is generally surrounded by developed lands supporting single- and multi-family uses, in addition to a large retail commercial center located at a distance to the west, paved roadways, and public utility and infrastructure systems. The site is currently undeveloped and has been previously graded. In addition, the site currently has a General Plan land use designation of General Commercial and is zoned CG-General Commercial, indicating the City's anticipation for future development of the property as a non-agricultural use.

Based on a review of historical aerial photographs and maps of the project area, the subject property was in use as agricultural land as recent as 1953; however, no structures or other development have been documented as having occurred on-site in the past. The land appears as barren dirt in photographs from 1996 to 2016, as it exists today (ECORP 2020b). Although the project would result in the conversion of Farmland of Local Importance to a non-agricultural use, the subject site has not been in active agricultural use for close to 70 years. Based on such conditions, combined with current zoning and General Plan land use designations that do not anticipate future agricultural uses, as well as the surrounding urbanized setting, development of the site as proposed is not anticipated to result in the loss of valuable farmland or adversely affect the City's inventory of agricultural resources over the long term.

For the reasons above, impacts relative to designated farmland are considered to be less than significant.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract? ***No Impact.***

As stated under Response 2(a), the site is zoned CG-General Commercial and is therefore not intended for agricultural use. The site is not subject to a Williamson Act contract and no agricultural uses are present on or adjacent to the property. Therefore, the project would not create a conflict with existing agricultural zoning for agricultural use or a Williamson Act contract. No impact would occur.

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.***

There are no lands zoned for forest or timber production on the project site or within the City of El Centro limits. Therefore, no impact would occur.

d) Result in the loss of forest land or conversion of forest land to non-forest use? ***No Impact.***

There are no designated forestlands on or adjacent to the project site, and therefore, the project would not convert any such lands to non-forest uses. No impact would occur.

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? ***Less than Significant Impact.***

Refer to Responses 2a) to 2d) above. The project site is not located within an agricultural use area and is located within proximity to lands that support single- and multi-family residential development, as well as retail commercial uses. It is not anticipated that development of the site would affect or encourage the conversion of any agricultural lands to a non-agricultural use. Thus, implementation of the project would not result in changes in the environment that would result in the conversion of farmland to non-agricultural use. Impacts would be less than significant.

3. Air Quality

	Potentially Significant Impact	Less Than Significant Impact With Mitigation	Less Than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. 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 nonattainment 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?	☐	☐	☒	☐

The following discussion is based upon the *Air Quality, Greenhouse Gas Emissions, and Energy Consumption Assessment* prepared by ECORP Consulting, Inc. (2021; see Appendix A). This document provides additional detailed discussion, background information, and other relevant information considered in the analysis.

DISCUSSION OF IMPACTS

a) Would the project conflict with or obstruct implementation of the applicable air quality plan? ***Less than Significant Impact.***

The project site is located in Imperial County. Air quality in the county is under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD) which serves as the local air quality agency and shares responsibility with the California Air Resources Board (CARB) for ensuring that state and federal ambient air quality standards are achieved and maintained in Imperial County. ICAPCD responsibilities include monitoring ambient air quality, planning activities such as modeling and maintenance of the emission inventory, and preparing clean air plans.

Clean air plans, known as State Implementation Plans (SIP), must be prepared for areas designated as nonattainment to demonstrate how the area will come into attainment of the exceeded ambient air quality standard. As identified in Table 3-1 under Response 3b), below, the project region of the Salton Sea Air Basin is classified nonattainment for federal O_3, $PM_{2.5}$, and PM_{10} standards (ECORP 2021).

The region's SIP includes the ICAPCD air quality plans: 2018 PM_{10} SIP, the 2018 Annual $PM_{2.5}$ SIP, the 2017 8-Hour Ozone SIP, 2013 24-Hour $PM_{2.5}$ SIP, the 2009 1997 8-hour Ozone RACT SIP, the 2009 PM10 SIP, and the 2008 Ozone Early Progress Plans. These air quality attainment plans are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards. These SIP plans and associated control measures are based on information derived from projected growth in Imperial County in order to project future emissions and then determine strategies and regulatory controls for the reduction of emissions. Growth projections are based on the general plans developed by Imperial County and the incorporated cities in the county, including El Centro.

As such, projects that comply with all applicable district rules and regulations, comply with all proposed control measures from the applicable plan(s), and propose development consistent with the growth anticipated by the respective general plan of the jurisdiction in which the proposed development is located (e.g., El Centro) would be consistent with the SIP. A project is nonconforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan by failing to adhere to air district rules or control measures, exceeding air district thresholds of significance, or proposing a development substantially denser than that assumed in the general plan.

The project would generate criteria air pollutants at levels below all applicable ICAPCD thresholds of significance (refer to Response 3b), below) and would be required to adhere to ICAPCD control measures such as Rule 801 and ICAPCD Regulation VIII. However, as previously described, a General Plan Amendment is proposed to change the existing General Plan land use designation from General Commercial to High Density Residential. Thus, the project as proposed is not consistent with the El Centro General Plan and is therefore potentially inconsistent with the types, intensity, and patterns of land use assumed for the site vicinity in ICAPCD's air quality planning efforts.

The ICAPCD air quality plans aim to reduce emissions of criteria pollutants for which the region is in nonattainment by establishing a program of rules and regulations directed at reducing air pollutant emissions and achieving state and national air quality standards. The project proposal to amend the General Plan land use designation from General Commercial to High Density Residential is consistent with this strategy. First, the project is considered infill development, as it proposes to develop a property in a rapidly urbanizing area with residential uses in close proximity to a wide range of commercial businesses and services (along N. Imperial Avenue)—which means the project can be identified for its "location efficiency." Location efficiency describes the location of the project relative to the type of urban landscape it's proposed to fit within. In general, compared to the statewide average, a project with location efficiency can realize automotive vehicle mile trip (VMT) reductions between 10 and 65 percent (ECORP 2021), which in turn results in reduced air pollutant emissions. The project would locate residences in proximity to existing off-site commercial uses, thereby providing commercial and work options to the future residents of the project site. The location efficiency of the project site would result in benefits that would reduce vehicle trips and VMT compared to the statewide average and would result in corresponding reductions in transportation-related emissions, a primary goal of the ICAPCD air quality planning efforts. Due to the wide range of commercial services along N. Imperial Avenue, the proposed General Plan Amendment and zone change would thereby enhance the physical design of the urban environment by instigating land use diversity and positioning more residents within close proximity to existing commercial land uses. The increases in land use diversity and mix of uses in the project area would reduce vehicle trips and VMT, compared to the statewide average, by encouraging walking and non-automotive forms of transportation, which would result in corresponding reductions in transportation-related emissions, a primary goal of the ICAPCD. For these reasons, the project proposal to amend the General Plan land use designation of the project site from General Commercial to High Density Residential would be consistent with ICAPCD strategies for integrating land use and transportation in a manner that reduces regional air pollutants, and thus is consistent with the applicable air quality management plans.

Because the proposed project is required to comply with applicable ICAPCD rules, regulations, and requirements for controlling emissions of the nonattainment air pollutants and their precursors, and since maximum daily pollutant emissions projected to result from the project are below ICAPCD significance thresholds, the project would not conflict with or obstruct implementation of any air quality plans. Impacts would be less than significant.

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 Impact.***

Ambient Air Quality

The USEPA and CARB designate air basins or portions of air basins and counties as being in "attainment" or "nonattainment" for each of the criteria pollutants. Areas that do not meet the standards are classified as nonattainment areas. The National Ambient Air Quality Standards (NAAQS) (other than for ozone [O_3], particulate matter [PM_{10} and $PM_{2.5}$], and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Ambient Air Quality Standards (CAAQS) are not to be exceeded during a three-year period. The attainment status for the Salton Sea Air Basin, which encompasses the project site, is included in Table 3-1.

Table 3-1: Attainment Status of Criteria Pollutants in the Salton Sea Air Basin

Pollutant	State Designation	Federal Designation
O_3	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
CO	Attainment	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Unclassified/Attainment

Source: ECORP 2021; see Appendix A.

The determination of whether an area meets the state and federal standards is based on air quality monitoring data. Some areas are unclassified, which means there is insufficient monitoring data for determining attainment or nonattainment. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant. The region is designated as a nonattainment area for the federal O_3, PM_{10}, and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (ECORP 2021).

ICPCD Thresholds of Significance

The significance criteria established by the applicable air quality management or air pollution control district (in this case, Imperial County Air Pollution Control District, or ICAPCD) may be relied upon to make the above determinations. The ICAPCD has identified significance thresholds for use in evaluating project impacts under CEQA. Accordingly, the ICAPCD recommended thresholds of significance to be used to determine whether project implementation would result in a significant air quality impact. Significance thresholds for evaluation of construction and operational air quality impacts are listed below in Table 3-2.

Table 3-2: ICAPCD Significance Thresholds – Pounds per Day

Criteria Pollutant and Precursors	Construction Activities Average Daily Emissions (lbs/day)	Operations Average Daily Emissions (lbs/day) Tier I Threshold	Operations Average Daily Emissions (lbs/day) Tier II Threshold
ROG	75	<137	>137
NO_x	100	<137	>137
PM_{10}	150	<150	≥150
$PM_{2.5}$	N/A	<550	>550
CO	550	<550	>550
SO_2	N/A	<150	>150

Source: ECORP 2021; see Appendix A.

Projects that are predicted to exceed Tier I thresholds require implementation of applicable ICAPCD standard mitigation measures to be considered less than significant. Projects exceeding Tier II thresholds are required to implement applicable ICAPCD standard mitigation measures, as well as applicable discretionary mitigation measures. Projects that exceed the Tier II thresholds after implementation of standard and discretionary mitigation measures would be considered to have a potentially significant impact to human health and welfare. ≥

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to 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 individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds are not considered to be cumulatively considerable.

Construction

The ICAPCD has established methods to quantify air emissions associated with construction activities such as air pollutant emissions generated by operation of on-site construction equipment, fugitive dust emissions related to grading and site work activities, and mobile (tailpipe) emissions from construction worker vehicles and haul/delivery truck trips. Emissions would vary from day to day, depending on the level of activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions. The use of construction equipment on-site would result in localized exhaust emissions.

Emissions associated with project implementation would be temporary and short term but have the potential to represent a significant air quality impact. Two basic sources of short-term emissions will be generated through project implementation: operation of the heavy-duty equipment (i.e., excavators, loaders, haul trucks) and the creation of fugitive dust during clearing and grading. Construction activities such as excavation and grading operations, construction vehicle traffic, and wind blowing over exposed soils would generate exhaust emissions and fugitive PM emissions that affect local air quality at various times during construction. Effects would be variable depending on the weather, soil conditions, the amount of activity taking place, and the nature of dust control efforts. The dry climate of the area during the summer months creates a high potential for dust generation. Construction activities would be subject to ICAPCD Rule 801, which requires taking reasonable precautions to reduce the amount of PM_{10} entrained in the ambient air as a result of emissions generated from construction and other earth-moving activities through actions to prevent, reduce, or mitigate PM_{10} emissions. In addition, the project is required to adopt best available control measures to minimize emissions from surface-disturbing activities to comply with ICAPCD Regulation VIII (Fugitive Dust Rules). Emissions associated with project off-road equipment, worker commute trips, and ground disturbance were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements.

Predicted maximum daily emissions attributable to project construction are summarized in Table 3-3. Such emissions are short term and of temporary duration, lasting only as long as project construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the ICAPCD thresholds of significance.

Table 3-3: Project Construction-Related Emissions (pounds per day)

Construction Year	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Construction 2021	10.03	45.87	26.67	0.11	11.77	2.99
Construction 2022	9.76	17.96	25.51	0.05	7.21	2.35
ICAPCD Daily Significance Threshold	*75*	*100*	*550*	*None*	*150*	*None*
Exceed Threshold?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod version 2016.3.2. Construction generated air pollutant emissions were calculated using a combination of model defaults for Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required (14,000 c.y. of cut material and 23,000 c.y. of fill material). Road silt loading has been increased to more accurately account for PM generated by worker commute and vendor traffic. Refer to Attachment A for Model Data Outputs.

As shown in Table 3-3, emissions generated during project construction would not exceed the ICAPCD's construction thresholds of significance. Therefore, criteria pollutant emissions generated during project construction 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.

Operation

The ICAPCD has also established significance thresholds to evaluate the potential impacts associated with long-term project operations. Regional air pollutant emissions associated with project operations include area source emissions, energy-use emissions, and mobile source emissions.

Implementation of the project would result in long-term operational emissions of criteria air pollutants such as PM_{10}, $PM_{2.5}$, carbon monoxide (CO), and sulfur dioxide (SO_2) as well as O_3 precursors such as reactive organic gases (ROGs) and nitrogen oxides (NO_X). Project-generated increases in emissions would be predominantly associated with motor vehicle use. Operational air pollutant emissions were based on the project site plans and the estimated traffic trip generation rates provided by Michael Baker International (2021; see Appendix E). Long-term operational emissions attributable to the project are identified in Table 3-4 and compared to the operational significance thresholds promulgated by the ICAPCD.

Table 3-4: Project Operational-Related Emissions (Regional Significance Analysis)

Emission Source	Pollutant (pounds per day)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Summer Emissions						
Area	4.99	0.17	14.89	0	0.08	0.08
Energy	0.08	0.71	0.30	0	0.06	0.06
Mobile	3.73	20.54	35.21	0.09	18.20	4.60
Total:	**8.80**	**21.42**	**50.40**	**0.09**	**18.34**	**4.74**
ICAPCD Daily Significance Threshold	*137*	*137*	*550*	*150*	*150*	*550*
Exceed ICAPCD Region Threshold?	***No***	***No***	***No***	***No***	***No***	***No***
Winter Emissions						
Area	4.99	0.17	14.89	0	0.08	0.08
Energy	0.08	0.71	0.30	0	0.06	0.06
Mobile	2.8	20.32	29.52	0.08	18.20	4.60
Total:	**7.87**	**21.20**	**44.71**	**0.08**	**18.34**	**4.74**
ICAPCD Daily Significance Threshold	*137*	*137*	*550*	*150*	*150*	*550*
Exceed ICAPCD Region Threshold?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod version 2016.3.2. Operational emissions were calculated using a combination of model defaults for Imperial County and an estimated project trip generation rate of 1,320 average daily trips. Road silt loading has been increased to more accurately account for PM generated by operational traffic. Refer to Attachment A for Model Data Outputs.

As shown in Table 3-4, the project's emissions would not exceed any ICAPCD thresholds for any criteria air pollutants during operation. Therefore, operational emissions projected to result from project implementation would be less than significant.

c) *Would the project expose sensitive receptors to substantial pollutant concentrations?* ***Less than Significant Impact.***

Sensitive receptors are defined as facilities or land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over age 65, children under age 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. The nearest existing sensitive receptors to the project site are multi-family residences located to the east (across 8th Street) and west (across N. 10th Street) of the project site.

Construction-Generated Air Contaminants

Construction-related activities would result in temporary, short-term emissions of diesel particulate matter (DPM), ROG, NO_x, CO, and PM_{10} from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., clearing, grading); soil hauling truck traffic; paving; and other miscellaneous activities. The El Centro portion of the Salton Sea Air Basin is listed as a nonattainment area for the federal O_3, PM_{10}, and PM2.5 standards and is also a nonattainment area for the state standards for O_3 and PM_{10}. Thus, existing O_3 and $PM_{2.5}$ levels in the project portion of the air basin are at unhealthy levels during certain periods. However, as shown in Table 3-3, the project would not exceed the ICAPCD significance thresholds for construction emissions.

The health effects associated with O_3 are generally associated with reduced lung function. Because the project would not involve construction activities that would result in O_3 precursor emissions (ROG or NO_x) in excess of the ICAPCD thresholds, the project is not anticipated to substantially contribute to regional O_3 concentrations and the associated health impacts.

CO tends to be a localized impact associated with congested intersections. In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions. The project would not involve construction activities that would result in CO emissions in excess of the ICAPCD thresholds. Thus, the project's CO emissions would not contribute to the health effects associated with this pollutant.

Particulate matter (PM_{10} and $PM_{2.5}$) contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing. For construction activity, DPM is the primary toxic air contaminant (TAC) of concern. Based on the emission modeling conducted, the maximum on-site construction-related daily emissions of exhaust $PM_{2.5}$, considered a surrogate for DPM, would be 0.72 pounds/day during construction in the year 2021, 0.43 pounds/day during construction in 2022 (see Appendix A). $PM_{2.5}$ exhaust is considered a surrogate for DPM because more than 90 percent of DPM is less than 1 microgram in diameter and therefore is a subset of particulate matter under 2.5 microns in diameter (i.e., $PM_{2.5}$). Most $PM_{2.5}$ derives from combustion, such as use of gasoline and diesel fuels by motor vehicles. As with O_3 and NO_x, the project would not generate emissions of PM_{10} or $PM_{2.5}$ that would exceed the ICAPCD's thresholds. Accordingly, the project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause any increase in related regional health effects for these pollutants.

Therefore, project construction would not result in a potentially significant contribution to regional concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants.

Operational Air Contaminants

Operation of the proposed project would not result in the development of any substantial sources of air toxics. There are no stationary sources associated with the operations of the project; nor would the project attract additional mobile sources that spend long periods queuing and idling at the site. On-site project emissions would not result in significant concentrations of pollutants at nearby sensitive receptors. The maximum operation-related emissions of exhaust PM2.5, considered a surrogate for DPM, would be 0.17 pounds in a single day. Therefore, the project would not be a substantial source of TACs. The project would not result in a high carcinogenic or non-carcinogenic risk during operation.

Naturally Occurring Asbestos

Another potential air quality issue associated with construction-related activities is the airborne entrainment of asbestos due to the disturbance of naturally occurring asbestos-containing soils. The proposed project is not located within an area designated by the State of California as likely to contain naturally occurring asbestos (ECORP 2021). As a result, construction-related activities would not be anticipated to result in increased exposure of sensitive land uses to asbestos.

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at congested intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or "hot spots," are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours.

However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. In 1993, much of the state was designated nonattainment under the California Ambient Air Quality Standards and NAAQS for CO. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration across the entire state is now designated as attainment. Detailed modeling of project-specific CO "hot spots" is not necessary and thus this potential impact is addressed qualitatively.

A CO "hot spot" would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur. The analysis prepared for CO attainment in the South Coast Air Quality Management District's (SCAQMD) 1992 Federal Attainment Plan for Carbon Monoxide in Los Angeles County and a Modeling and Attainment Demonstration prepared by the SCAQMD as part of the 2003 Air Quality Management Plan can be used to demonstrate the potential for CO exceedances of these standards. The SCAQMD conducted a CO hot spot analysis as part of the 1992 CO Federal Attainment Plan at four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated were Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. Despite this level of traffic, the CO analysis concluded that there was no violation of CO standards (ECORP 2021). In order to establish a more accurate record of baseline CO concentrations affecting the South Coast Air Basin, a CO "hot spot" analysis was conducted in 2003 at the same four busy intersections in Los Angeles at the peak morning and afternoon time periods. This "hot spot" analysis did not predict any violation of CO standards. The highest one-hour concentration was measured at 4.6 ppm at Wilshire Boulevard and Veteran Avenue and the highest eight-hour concentration was measured at 8.4 ppm at Long Beach Boulevard and Imperial Highway.

Similar considerations are also employed by other air districts when evaluating potential CO concentration impacts. Specifically, the Bay Area Air Quality Management District, the air district for the San Francisco Bay Area, concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical and/or horizontal air does not mix in order to generate a significant CO impact.

According to the traffic analysis prepared for the project (Michael Baker International 2021), the project is anticipated to generate 1,320 daily trips on average. Because the proposed project would not increase traffic volumes at any intersection to more than 100,000 vehicles per day, or even 44,000 vehicles per day, there is no likelihood of the project traffic exceeding CO values. CO "hot spots" are not an environmental impact of concern for the project. Localized air quality impacts related to mobile source emissions would not be a concern.

Therefore, the project would not expose sensitive receptors to substantial pollutant concentrations. Impacts would be less than significant.

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.***

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast food restaurant) may be acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Construction

During construction, the proposed project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the site. However, these emissions are short term in nature and will rapidly dissipate and be diluted by the atmosphere downwind of the emission sources.

Additionally, odors would be localized and generally confined to the construction area. Given that there are no natural topographic features (e.g., canyon walls) or man-made structures (e.g., tall buildings) that would potentially trap such emissions, construction-related odors would occur at magnitudes that would not affect substantial numbers of people.

Operation

Criteria for evaluation of odor impacts are found in Table 3 of the ICAPCD's CEQA Air Quality Handbook (2017). The ICAPCD's Handbook identifies certain land uses as potential sources of odors. These land uses include wastewater treatment plants, sanitary landfills, composting station, feedlots, asphalt batching plants, painting/coating operations (including auto body shops), or rendering plants. The project proposes residential uses that would not include any of the land uses identified by the ICAPCD as potential odor-generating sources.

Therefore, the project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.

4. Biological Resources

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES. 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 Wildlife or US 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, or regulations, or by the California Department of Fish and Wildlife or US 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 wetlands, 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?	☐	☐	☐	☒

The following discussion is based upon the *Biological Resources Report* prepared by ECORP Consulting, Inc. (2020a; see Appendix B).

DISCUSSION OF IMPACTS

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 Wildlife or US Fish and Wildlife Service?* ***Less than Significant Impact with Mitigation Incorporated.***

Database searches were performed to identify special-status species with the potential to occur in the area. Database searches were performed on the following websites:

- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) within five miles of the project area

- CDFW Special Animals Lists
- US Fish and Wildlife Service (USFWS) Critical Habitat Portal and Information for Planning and Consultation (IPaC) Trust Resource List
- California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Plants
- Calflora Information on California Plants
- USFWS National Wetland Inventory

No sensitive plant species with the potential to occur within the project area were identified. One special-status wildlife species, burrowing owl, a federal Bird of Conservation Concern and a California Species of Special Concern, was determined to have a moderate potential to occur within the survey area. See Appendix B for the database search results and summary.

Site Survey Results

A site survey conducted on October 1, 2020, confirmed that the site appears to have been previously graded and disturbed and is characterized by ruderal, non-native vegetation that typically has limited ecological value. The entirety of the project site is classified as disturbed habitat. Dominant plant species observed included native herbs bush seepweed and silverscale saltbush, as well as non-native herbs tamarisk and fivehook bassia. These plant species were located on the periphery of the project area as the central portion of the project area was recently graded and did not support vegetation. Portions of lands buffering the site are also classified as disturbed: vacant lots to the north, northeast, and east. Vegetation on such lands consists of native herbs bush seepweed and silverscale saltbush, as well as ruderal species including tamarisk, fivehook bassia, Russian thistle, and puncture vine and non-native grasses including red brome.

Habitats and Vegetation Communities

Habitat and land cover within the survey area are not considered sensitive biological resources. All proposed disturbance and construction staging would occur on previously graded and disturbed lands.

Special-Status Species

Candidate, sensitive, or special-status species are commonly characterized as species that are at a potential risk or actual risk to their persistence in a given area or across their native habitat. These species have been identified and assigned a status ranking by governmental agencies such as the CDFW and USFWS, and private organizations such as the CNPS. The degree to which a species is at risk of extinction is the determining factor in the assignment of a status ranking. Some common threats to a species' or population's persistence include habitat loss, degradation, fragmentation, human conflict, and intrusion. For the purposes of this MND, special-status species are defined by the following codes:

1. Listed, proposed, or candidates for listing under the federal Endangered Species Act (50 Code of Federal Regulations [CFR] 17.11;
2. Listed or proposed for listing under the California Endangered Species Act (Fish and Game Code [FGC] 1992 Section 2050 et seq.; 14 California Code of Regulations [CCR] Section 670.1 et seq.);

3. Designated as Species of Special Concern by the CDFW;
4. Designated as Fully Protected by the CDFW (FGC Sections 3511, 4700, 5050, 5515); and,
5. Species that meet the definition of rare or endangered under CEQA (14 CCR Section 15380), including CNPS List Rank 1b and 2.

Special-status plants and wildlife species reported for the region in the literature review or for which suitable habitat occurs were evaluated for their potential to occur within the project area or in adjacent areas where indirect impacts could occur; refer to Appendix B**.**

Special-Status Plant Species

No special-status plant species were observed within the survey area during the field assessment. All special-status plants were determined unlikely to occur within the survey area due to the lack of suitable habitat and/or other conditions such as soil or elevation.

Special-Status Wildlife Species

Special-status wildlife species with occurrence records were assessed for the potential to occur within the survey area. One special-status wildlife species, burrowing owl, a federal Bird of Conservation Concern and a California Species of Special Concern, was determined to have a moderate potential to occur within the survey area. Burrowing owl is a small owl typically found in dry open areas with few trees and short grasses such as prairie, pastures, and desert scrublands. This species is also found near human habitation in agricultural areas, vacant lots, and airports and uses uninhabited mammal burrows for roosts and nests, often times in close proximity to California ground squirrel colonies.

The disturbed project site provides habitat for burrowing owl; however, on-site soils are not suitable for burrowing. Some disturbed lots surrounding the project site have more suitable soils for burrowing. No sign of burrowing owl was observed during the site survey, and no mammal burrows or berms were observed throughout the entirety of the survey area. However, the species has been previously recorded within 5 miles of the site with the closest being approximately 2 miles away. Due to the presence of moderately suitable habitat and known records within 5 miles of the site, this species was determined to have a moderate potential to occur.

Therefore, the project has the potential for direct and indirect impacts to burrowing owl. Although no burrowing owl or potential burrows were identified during the field survey, conditions could change by the time project construction activities begin. Additional vegetation could grow on-site if not maintained and provide suitable nesting habitat for ground dwelling/sparse shrub nesting birds. Additionally, soils within the project area could become compacted enough to become suitable for California ground squirrel and other burrowing mammals. Because recent occurrences of burrowing owl have been recorded in the project area, a preconstruction survey is recommended. Mitigation measure **BIO-1** would reduce potential impacts to special-status wildlife species to less than significant.

Therefore, the project would have the potential to have a substantial adverse effect, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. With implementation of mitigation measure **BIO-1**, impacts would be reduced to less than significant.

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, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?* ***No Impact.***

Sensitive habitats include those that are of special concern to resource agencies and those that are protected under CEQA, F G C Section 1600, and Section 404 of the Clean Water Act. No waters of the state or waters of the United States occur within the project site. As stated above, the site is highly disturbed and habitat is characterized by ruderal, non-native vegetation that typically has limited ecological value. Therefore, no impact to riparian habitat or other sensitive natural communities would occur with project implementation.

c) *Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption, or other means?* ***No Impact.***

Project implementation would not result in the loss of jurisdictional waters of the state and waters of the United States. No waters of the state or United States occur within the project site. As a result, no impact to federally protected wetlands would occur.

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 Impact with Mitigation Incorporated.***

Native bird species and their nests are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code 703- 712). Potential nesting habitat within the project area is limited to birds that nest on the ground and in open, sparsely vegetated habitat. The project area provides limited foraging habitat for migratory bird species and raptors. Lands buffering the project site support ornamental, landscaped trees and shrubs that could potentially provide nesting habitat for migratory bird species and, in some locations, for raptors; however, they are situated adjacent to highly trafficked areas (i.e., roads and structures). Therefore, raptor species are not expected to use these trees for nesting, nor anticipated to be directly affected by project construction activities. Disturbed areas within lands buffering the project site appear to be consistently tended (i.e., graded lot) or contain limited vegetation; therefore, foraging habitat is of low quality for raptors. No nests were observed within the survey area during the field survey .

Due to conditions on-site and on adjacent lands, project implementation would not interfere substantially with the movement of native resident or migratory fish or wildlife species. No established migratory routes, wildlife corridors, or linkages were identified on-site or within the vicinity. Due to the generally developed character of the project vicinity, there is a low potential for wildlife to use or pass through the area as a corridor.

However, there is potential for migratory and nesting birds to be impacted by project activities. Although no nesting birds were identified during the field survey, conditions could change by the time project construction activities begin. Vegetation could grow on-site and, if not maintained, could provide nesting habitat for ground dwelling/sparse shrub nesting birds. Direct and/or indirect impacts may occur during project construction if a nest is physically disturbed or destroyed, or if breeding or nesting activities are disrupted or cease due to noise or increased human activity. Mitigation measure **BIO-2** is proposed to ensure that direct and indirect impacts to migratory species would be reduced to less than significant.

e) *Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?* ***No Impact.***

There are currently no adopted or proposed local policies or ordinances protecting biological resources that affect the project site. As stated, the project site is highly disturbed and does not support sensitive biological resources, including mature trees. Therefore, no impact would occur.

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.***

There are currently no adopted or proposed habitat conservation plans, natural community conservation plans, or other approved local, regional, or state habitat conservation plans that affect the project site. Therefore, no impact would occur.

Mitigation Measures

BIO-1 Burrowing Owl Habitat Assessment. A preconstruction habitat assessment shall be required for burrowing owls within the one-month period prior to construction. The habitat assessment shall be conducted within the impact area and a 500-foot buffer (where practicable) to assess the area for suitable habitat and the presence of any burrows or burrow surrogates (e.g., culverts, open drain tiles, riprap, and/or discarded tires). If no burrows or burrow surrogates are present, a survey shall not be required. If burrows or burrow surrogates are present, a preconstruction burrowing owl survey shall be required between 14 and 30 days prior to the start of construction.

Timing/Implementation: Prior to commencement of project construction

Enforcement/Monitoring: City of El Centro Community Development Department

BIO-2 Compliance with Migratory Bird Treaty Act. If construction activities (for example, but not limited to staging, site preparation, grading) commence during the breeding season (January 1st through July 31st for raptors and March 1st through September 15th for songbirds), a pre-construction nesting bird survey shall be conducted by a qualified biologist. The survey shall be performed within three days prior to the commencement of construction activities. Surveys shall include the construction area plus a 500-foot buffer. Survey findings would be documented prior to initiating any construction activities.

If no nesting birds are observed during the survey, implementation of project activities may begin. If nesting birds (including nesting raptors) are found to be present, avoidance or minimization measures shall be undertaken. Measures shall include establishment of an avoidance buffer until nesting has been completed. The width of the buffer will be determined by the biologist based on CDFW recommendations. The qualified biologist will determine the appropriate buffer size and level of nest monitoring necessary for species not listed under the federal or California Endangered Species Acts based on the species' life history, the species' sensitivity to disturbances (e.g., noise, vibration, human activity), individual behavior, status of nest, location of nest and site conditions, presence of screening vegetation, anticipated project activities, ambient noise levels compared to project-related noise levels, existing non-project-related disturbances in vicinity, and ambient levels of human activity.

Buffers will be marked (flagged or fenced with environmentally sensitive area fencing) around any active nests and periodic monitoring by the qualified biologist will occur to ensure the project does not result in the failure of the nest. The buffer(s) will be maintained around each nest until the nest becomes inactive as determined by the qualified biologist. At the discretion of the qualified biologist, if a nesting bird appears to be stressed as a result of project activities and the buffer does not appear to provide adequate protection, additional minimization measures may need to be implemented.

Construction may continue outside of the no-work buffers. The qualified biologist will ensure that restricted activities occur outside of the delineated buffers, check nesting birds for any potential indications of stress, and ensure that installed fencing or flagging is properly maintained during nest monitoring and any additional site visits. Buffer sizes may be adjusted (either increased or reduced), or the extent of nest monitoring may be adjusted, at the discretion of the qualified biologist based on the conditions of the surrounding area and/or the behavior of the nesting bird.

Any changes to buffer sizes and/or nest monitoring frequency will be documented. If listed species are found to be nesting in the survey area, construction activity should not occur without coordination with regulating agencies and may require an agency-approved bird management plan.

Timing/Implementation: Prior to commencement of project construction

Enforcement/Monitoring: City of El Centro Community Development Department

Mitigation measures **BIO-1** and **BIO-2** can occur concurrently if project and seasonal timing allow.

Level of Significance after Mitigation:

Less than significant.

5. Cultural Resources

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

The following discussion is based upon the *Cultural Resources Inventory* prepared by ECORP Consulting, Inc. (2020b; see Appendix C).

DISCUSSION OF IMPACTS

a) *Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?* ***Less than Significant Impact with Mitigation Incorporated.***

The project site is currently undeveloped and does not support any existing structures or improvements. No historic-period resources have been identified on the site over past decades; refer to the discussion below.

To evaluate the potential for the presence of historical resources, ECORP requested a records search for the property at the South Coastal Information Center (SCIC) of the California Historical Resources Information System (CHRIS) at San Diego State University on October 2, 2020; refer to Appendix C. The purpose of the records search was to determine the extent of previous surveys conducted within a 1-mile radius of the project site and whether previously documented pre-contact or historic-period archaeological sites, architectural resources, or traditional cultural properties exist within the area.

As part of the investigation, relevant databases were searched for potential historical records within the project area. The National Register Information System did not list any eligible or listed properties within the project area or 1-mile vicinity. Additionally, no resources were identified as listed as California Historical Landmarks and by the Office of Historic Preservation. A search of historic General Land Office land patent records also revealed no historic-period resources in the project area or 1-mile search radius. Additionally, the Caltrans Bridge Local and State Inventories did not list any historic bridges in the project area.

Twenty-eight previous cultural resource investigations have been conducted within one mile of the project area between 1977 and 2018. No previous cultural resources investigations overlap the project area and the records search indicates that the project area has not been previously surveyed as part of a cultural resources technical study; refer to Appendix C for a list of previous cultural resource investigations. The CHRIS records search determined that three previously recorded cultural resources are located within 1 mile of the project site: two historic period railroad segments and one historic-period road (refer to Table 5-1). No previously recorded resources are located on the project site.

Table 5-1: Previously Recorded Cultural Resources in or within One Mile of the Project Area

Primary Number	Site Number	Age/Period	Site Description	Within Project Area?
P-13-008682	CA-IMP-8166H	Historic	Segment of Niland to Calexico Railroad (1902-1904), Southern Pacific Company	No
P-13-009302	CA-IMP-84899H	Historic	Segment of San Diego & Arizona Eastern Railroad (1907-1917)	No
P-13-014314	--	Historic	Segment of Villa Road	No

Source: ECORP 2020b; refer to Appendix C.

A field survey was conducted on October 14, 2020, by ECORP personnel. No pre-contact or historic-period cultural resources were identified during the field survey.

No evidence of structures or historic-period resources were identified on the project site through a review of historic aerial photographs dated 1936 to present. Based on the above findings, the project would not disturb any known historical resources as defined under CEQA or historic properties as defined by Section 106 of the National Historic Preservation Act. The project would not cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.

However, the project may have the potential to uncover unknown historical resources during ground-disturbing activities such as grading and/or construction. Such impacts would be reduced with incorporation of mitigation measure **CUL-1** to ensure that proper measures are taken for the protection, evaluation, and documentation of such resources, as appropriate. With implementation of mitigation measure **CUL-1**, potential impacts to historic resources would be reduced to less than significant.

b) *Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?* ***Less than Significant Impact with Mitigation Incorporated.***

The underlying geology of the project area has been mapped as Quaternary alluvium and marine deposits dated to the Pliocene to Holocene (5.333–0 million years ago). This geologic deposit is described as alluvium, lake, playa, and terrace deposits of unconsolidated and semi-consolidated material. The project area lies within the boundaries of the now dry Lake Cahuilla, an ancient lake fed by waters of the Colorado River that existed periodically throughout the Pleistocene and Holocene until ultimately drying up around 400 years before present. Therefore, the potential exists for buried pre-contact archaeological sites in the project area due to the exploitation of lake resources by Native American communities in pre-contact times.

According to the US Department of Agriculture's Natural Resources Conservation Service (NRCS) Web Soil Survey website, two soil types are located within the project area: Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes; and Imperial silty clay, wet. These soils are classified as torrifluvents and result from fluvial deposition during flooding events in arid alluvial plains.

As stated above, a records search of the CHRIS at the SCIC on October 2, 2020, revealed that 28 cultural resources investigations were conducted in or within 1 mile of the project area. Three cultural resources were previously recorded within 1 mile of the project area as a result of these investigations; refer to Table 5-1. However, no cultural resources have been previously identified on the project site. A search of the Sacred Lands File was also completed by the California Native

American Heritage Commission (NAHC) on October 1, 2020, and resulted in a negative finding, meaning that no Native American Sacred Lands have been recorded in the project area.

Additionally, a field survey of the project area was conducted on October 12, 2020. No cultural resources were identified or recorded as a result of the field survey.

However, as mentioned, project ground-disturbing activities could potentially encounter previously undiscovered archaeological resources, due to the history of the area. Though no pre-contact cultural resources have been previously recorded in the project area or its 1-mile vicinity, the potential for subsurface cultural deposits still exists due to the presence of sediments contemporaneous with human occupation of the region, and the location of the project area within the dry lakebed of ancient Lake Cahuilla.

Mitigation measure **CUL-1** is therefore proposed to require that, in the event of discovery of unknown cultural resources on-site, proper measures are taken for protection, evaluation, and documentation of such resources, as appropriate. Implementation of mitigation measure **CUL-1** would ensure that the project does not cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. Impacts would be reduced to less than significant.

*c) Would the project disturb any human remains, including those interred outside of formal cemeteries? **Less than Significant Impact with Mitigation Incorporated**.*

No human remains were identified in the project area through the records search or field survey conducted as part of the archaeological assessment. However, unidentified humans remains, whether as part of a prehistoric cemetery, an archaeological site, or an isolated occurrence, could be present below the ground surface.

If human remains are encountered during construction, the California Health and Safety Code and State CEQA Guidelines Section 15064.5(e) require that work in the immediate area must halt, the remains must be protected, and the county coroner must be notified immediately. If the remains are determined to be Native American, then the NAHC must be notified (typically by the coroner) within 24 hours, as required by PRC Section 5097. The NAHC would identify and contact a most likely descendant, who would be given the opportunity to provide recommendations for the treatment of the remains within 48 hours of being granted access to the site. Mitigation measure **CUL-1** would ensure that such requirements are adhered to. With implementation of mitigation measure **CUL-1**, potential impacts relative to human remains would be reduced to less than significant.

Mitigation Measures

CUL-1 If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work shall halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

a) If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately and no agency notifications are required.

b) If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, he or she shall immediately notify the City and the landowner. The lead agency shall consult on a finding of eligibility and implement appropriate treatment measures if the find is determined to be a Historical Resource under CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines, or a Historic Property, as defined in 36 CFR 60.4. Work may not resume within the no-work radius until the lead agency, through consultation as appropriate, determines that the site either: 1) is not a historical resource under CEQA or a historic property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.

c) If the find includes human remains, or remains that are potentially human, the professional archaeologist shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Imperial County coroner (per Section 7050.5 of the Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, PRC Section 5097.98, and AB 2641 will be implemented. If the coroner determines the remains are Native American and not the result of a crime scene, the coroner will notify the NAHC, which then will designate a Native American most likely descendant (MLD) for the project (PRC Section 5097.98). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC may mediate (PRC Section 5097.94). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (PRC Section 5097.98). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with Imperial County (AB 2641). Work may not resume within the no-work radius until the lead agency, through consultation as appropriate, determines that the treatment measures have been completed to their satisfaction.

Level of Significance after Mitigation

Less than significant.

6. Energy

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
6. ENERGY. 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?	☐	☐	☒	☐

The following discussion is based upon the *Air Quality, Greenhouse Gas Emissions, and Energy Consumption* Assessment prepared by ECORP Consulting, Inc. (2021; see Appendix A).

The Imperial Irrigation District (IID) provides electricity to all of Imperial County, including the project site, along with parts of Riverside and San Diego Counties (IID 2021). Nearly 60 percent of its power is supplied locally using hydroelectric facilities, a steam-generating facility, several gas turbines, and a diesel unit. The Southern California Gas Company provides natural gas services to the project area. Southern California Gas services approximately 21.8 million customers, spanning roughly 24,000 square miles of California (SCG 2021).

DISCUSSION OF IMPACTS

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.***

Levels of construction and operational related energy consumption estimated to be consumed by the project include the number of kWh of electricity, therms of natural gas, and gallons of gasoline. Energy use quantification was based on project-specific information such as the estimated traffic trip generation rates and project site plans.

The four sources of energy that are relative to the proposed project include electricity, natural gas, the equipment-fuel necessary for project construction, and the automotive fuel necessary for project operations. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, or unnecessary consumption of energy for a land use project. For the purpose of this analysis, the amount of electricity and natural gas estimated to be consumed by the project was quantified and compared to that consumed by all residential land uses in Imperial County. Similarly, the amount of fuel necessary for project construction and operations were calculated and compared to that consumed in Imperial County.

Energy consumption associated with the project is summarized in Table 6-1.

Table 6-1: Project Energy and Fuel Consumption

Energy Type	Annual Energy Consumption	Percentage Increase Countywide
Electricity Consumption[1]	928,747 kilowatt-hours	0.16 percent
Natural Gas[1]	28,034 therms	0.34 percent
Automotive Fuel Consumption		
Project Construction 2021[2]	49,064 gallons	0.02 percent
Project Construction 2022[2]	30,443 gallons	0.01 percent
Project Operations[3]	159,507 gallons	0.08 percent

Source: ECORP 2021; see Appendix A.

Notes: [1] CalEEMod; [2] Climate Registry 2016; [3] EMFAC2017 (CARB 2017)

The project increases in electricity and natural gas consumption are compared with all of the residential buildings in Imperial County in 2019, the latest data available. The project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2020, the most recent full year of data.

Project operation would include electricity and natural gas usage from lighting, space and water heating, and landscape maintenance activities. As shown in Table 6-1, the annual electricity consumption due to operations would be 928,747 kWh resulting in an approximate 0.16 percent increase in the typical annual electricity consumption attributable to all residential uses in Imperial County. Furthermore, the project's increase in natural gas usage of 0.34 percent across all residential uses in Imperial County would also be negligible. For these reasons, the project would not result in the inefficient, wasteful, or unnecessary consumption of building energy.

Fuel necessary for project construction would be required for the operation and maintenance of construction equipment and the transportation of materials to the project site. The fuel expenditure necessary to construct the physical building and infrastructure would be temporary, lasting only as long as project construction. As further indicated in Table 6-1, the project's gasoline fuel consumption during the one-time construction period is estimated to be 49,064 gallons of fuel during 2021 construction and 30,443 gallons of fuel during 2022 construction. This would increase the annual countywide gasoline fuel use in the county by 0.02 percent and 0.01 percent, respectively. As such, project construction would have a nominal effect on local and regional energy supplies. No unusual project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the state. Construction contractors would purchase their own gasoline and diesel fuel from local suppliers and would judiciously use fuel supplies to minimize costs due to waste and subsequently maximize profits. Additionally, construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency, combined with state regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during project construction. It is therefore anticipated that construction fuel consumption associated with the project would not be any more inefficient, wasteful, or unnecessary than other similar development projects of this nature.

The project is estimated to generate approximately 1,320 daily trips; refer also to Section 17, Transportation and Appendix E. As indicated in Table 6-1, this would be a consumption of approximately 159,507 gallons of automotive fuel per year, which would increase the annual countywide automotive fuel consumption by 0.08 percent. The amount of operational fuel use was estimated using CARB's EMFAC2017 computer program, which provides projections for typical daily fuel usage in Imperial County. This analysis conservatively assumes that all automobile trips projected to arrive at the project during operations would be new to Imperial County. Further, a conservative approach was taken for vehicle trip estimation to ensure potential impacts due to operational gasoline usage were adequately accounted. Fuel consumption associated with vehicle trips generated by the project would therefore not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region.

Based on the discussion above, the project would not result in a potentially significant environmental impact due to the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. Impacts would be less than significant.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? ***Less than Significant Impact.***

The project has been designed in a manner that is consistent with relevant energy conservation plans aimed at encouraging development that results in the efficient use of energy resources. The project would be built to the Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations (Title 24). Title 24 was established in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 is updated approximately every three years. The most recent 2019 update to the Energy Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings.

Additionally, the California Green Building Standards Code (CalGreen, amended 2013) establishes mandatory green building standards for all buildings in California. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. The project would be designed consistent with such requirements to ensure that energy efficiency is achieved as required. Furthermore, the project would be consistent with the City's General Plan Conservation and Open Space Element, specifically Energy Conservation Implementation Program action COS-20, Implement State Energy Performance Requirements, which encourages project proponents to incorporate energy conservation techniques through the implementation of State energy performance standards.

For the reasons above, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

7. Geology and Soils

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
7. GEOLOGY AND SOILS. 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 projects, and potentially result in on- or off-site landside, 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 wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

The following analysis is based upon available soils and geotechnical data from various sources, including databases, soils maps, and the City of El Centro General Plan. A *Geotechnical* Investigation was prepared for the property immediately west of the project site in June 2007 (Landmark Consultants, Inc. 2007; available under separate cover). Relevant information from the report was reviewed and incorporated herein where appropriate relative to the proposed project.

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.***

There are no known faults traversing the project site or in the vicinity of the project site or in the City of El Centro (City of El Centro 2004). The project site is not located in a fault rupture hazard zone identified by the Alquist-Priolo Earthquake Fault Zoning Act, Special Publication 42, Revised 1997, Fault-Rupture Hazards Zones in California, or located within any other area with substantial evidence of a known fault (DOC 2018a). However, like much of Southern California, the project site is located in a seismically active area. The City requires proper development engineering and building construction of proposed development and enforces these requirements through the development and environmental review process. Adherence to the California Building Code (CBC), as adopted in the City of El Centro Municipal Code, with regard to construction of the project development would ensure that impacts relative to rupture of a known earthquake fault remain less than significant.

ii) Strong seismic ground shaking? ***Less than Significant Impact.***

The Imperial Valley, which includes the project site, is susceptible to seismic ground shaking. The valley is considered likely to be subjected to moderate to strong ground motion from earthquake events in the larger region (Landmark Consultants 2007). Branches of the San Andreas Fault form the eastern boundary of the basin (Salton Trough) and the western edge is defined by the San Jacinto-Coyote Creek and the Elsinore-Laguna Salada Faults. A greater number of small to moderate earthquakes have occurred in the Imperial Valley area than along any other section of the San Andreas Fault system. The Imperial Fault is located approximately 5 miles to the east of the City of El Centro (City of El Centro 2004), while the Imperial, Brawley, and Superstition Hills Faults are also subject to the potential for strong seismic ground shaking in the project vicinity (Landmark Consultants 2007).

To ensure the structural integrity of all buildings and structures, the project is required to conform to the Seismic Requirements as outlined in the CBC. Development would require implementation of project design measures and adherence to the CBC, as adopted in the City of El Centro Municipal Code. Therefore, compliance with the CBC and City Code would ensure that the project does not result in a potentially significant impact from the exposure of people or structures to potential adverse effects from strong seismic ground shaking. Implementation of such design and building techniques would reduce potential impacts to less than significant.

iii) Seismic-related ground failure, including liquefaction? ***Less than Significant Impact.***

Liquefaction is the phenomenon whereby soils lose shear strength and exhibit fluid-like flow behavior. Loose granular soils are most susceptible to these effects, with liquefaction generally restricted to saturated or near-saturated soils at depths of less than 50 feet. Liquefaction normally occurs in soils such as sand in which the strength is purely friction. However, liquefaction has occurred in soils other than clean sand. Liquefaction occurs under vibratory conditions such as those induced by a seismic event.

Groundwater in the site vicinity has been historically encountered at approximately 9 to 10 feet below ground surface (bgs) (Landmark Consultants 2007). However, groundwater levels may fluctuate with precipitation, irrigation of adjacent lands, drainage, and site grading. Nonetheless, such groundwater levels may indicate the potential for liquefaction to occur on-site.

Project design and construction would incorporate standard design measures to address potential seismic-related liquefaction and related effects such as settlement and lateral spreading, including similar types of measures from the CBC. However, the project would also be required to prepare a comprehensive design-level geotechnical evaluation prior to final design and construction. Completion of this evaluation and adherence to the current CBC and local codes regulating construction would ensure that the project is designed to withstand seismic-related ground failure, including liquefaction. With a site-specific engineering design, impacts due to liquefaction would be less than significant.

iv) *Landslides?* ***No Impact.***

The topography of the City of El Centro is generally flat. Therefore, landslides are not considered to represent a major safety hazard (City of El Centro 2004).

The topography of the project site and surrounding vicinity is relatively flat with on-site elevations ranging from approximately 51 feet below mean sea level to approximately 39 feet below mean sea level across the property (ECORP 2020b). The project site has been previously graded and does not include slopes greater than 25 percent. Further, signs of landslides are not present on-site. Therefore, no significant impact from exposure of people or structures to potential adverse effects from landslides would occur.

b) Would the project result in substantial soil erosion or the loss of topsoil? ***Less than Significant Impact.***

Soil erosion is most prevalent in unconsolidated alluvium and surficial soils and in areas that have slopes. Erosive soils are generally found in areas of steep slope where runoff velocity is greater and vegetative cover is low. According to the US Department of Agriculture's Natural Resources Conservation Service Web Soil Survey website, two soil types are located within the project area: Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes; and Imperial silty clay, wet. These soils are classified as torrifluvents and result from fluvial deposition during flooding events in arid alluvial plains (ECORP 2020b).

Grading and trenching during project construction would displace soils and temporarily increase the potential for soils to be subject to wind and water erosion. In addition, the project would increase impervious surface areas on-site, which would potentially contribute to increased stormwater runoff.

The project applicant would be required to meet City grading standards and prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with National Pollutant Discharge Elimination System Permit (NPDES) requirements for approval by the City prior to grading. The SWPPP would identify specific best management practices (BMPs) to be implemented by the project applicant to prevent erosion, minimize siltation from impacting downstream water bodies, and protect water quality. Grading regulations specified in the City's Municipal Code require preparation of an erosion control plan prior to the issuance of a grading permit (Chapter 7, Article XIX, Section 7-124) and implementation of BMPs during construction to reduce the potential for soil erosion to occur (Chapter 22, Article VII, Division 1, Section 22-707; Ord. No. 15-05, §1, 4-21-15). With conformance to the above standards, project impacts related to soil erosion or the loss of topsoil would be less than significant.

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 projects, and potentially result in on- or off-site landside, lateral spreading, subsidence, liquefaction, or collapse? ***Less than Significant Impact.***

The City of El Centro rests upon a bed of deep lacustrine (lakebed) deposits which consist of interbedded lenticular and tabular silt, sand, and clay (Landmark Consultants 2007). Such conditions generally require the conditioning of soils in order to support structural footings and reinforced foundations.

On- or Off-Site Landslide

Refer to Response 7(a)iv), above. The occurrence of bluff failure and mudslides in the Imperial Valley is generally limited to slopes and embankments of the rivers and canals (El Centro 2003). The project site is generally level and does not support any slopes or hillsides, and therefore would not be susceptible to landslides. Furthermore, the project as designed would be required to comply with structural standards set forth by both the City and the state. Impacts in this regard would be less than significant.

Lateral Spreading

Lateral spreading is a phenomenon in which large blocks of intact, non-liquefied soil move down slope on a liquefied soil layer. Lateral spreading is often a regional event. For lateral spreading to occur, the liquefiable soil zone must be unconstrained laterally and free to move along sloping ground.

The project site is generally flat and does not support slopes that may be subject to the potential for lateral spread. The risk of lateral spreading can be further reduced through appropriate land use planning, development engineering, and building construction practices. As such, the project would comply with the most recent CBC, Uniform Mechanical Code, Uniform Fire Code, and National Electric Code, as adopted by the City of El Centro, which contain structural requirements for existing and new buildings designed to ensure structural integrity during seismic events and to prevent injury, loss of life, and substantial property damage due to liquefaction. Conformance with such regulations would ensure that project impacts relative to lateral spreading remain less than significant.

Liquefaction

Refer to Response 7(a)iii), above. A geotechnical investigation prepared for lands adjacent to the west of the project site determined that 1- to 5-foot-thick, isolated, interbedded layers of silty sand exist at a depth between 10 and 48 feet and may liquefy under seismically induced ground shaking. The estimated settlement of approximately 1.5 to 3.75 inches was identified as sufficient to require deep ground improvement or specially designed foundations at the site (Landmark Consultants 2007). Similar conditions may therefore be present on the project site and would be considered in identifying appropriate engineering methods to minimize potential effects of liquefaction-induced settlements.

The risk of liquefaction can be reduced through appropriate land use planning, development engineering, and building construction practices. As such, the project would comply with the most recent CBC, Uniform Mechanical Code, Uniform Fire Code, and National Electric Code, as adopted by the City of El Centro, which contain structural requirements for existing and new buildings designed to ensure structural integrity during seismic events and to prevent injury, loss of life, and substantial property damage. Conformance with such requirements would reduce potential impacts relative to liquefaction to less than significant.

Collapse

Neither natural nor man-made subsurface features that encourage collapse, including mines, aggregate extraction operations, or karst topography, are known to underlie or occur adjacent to the project site. Therefore, mandatory compliance with applicable codes would ensure that impacts related to unstable or collapsible soils would be less than significant.

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 are those that undergo volume changes as moisture content fluctuates, swelling substantially when wet or shrinking when dry. Soil expansion can damage structures by cracking foundations, causing settlement, and distorting structural elements.

In general, much of the near surface soils in the Imperial Valley consist of silty clays and clays which are moderate to highly expansive (Landmark Consultants 2007). As indicated above, the project site is underlain by Imperial-Glenbar silty clay loams and Imperial silty clay (ECORP 2020b). Based on the clay content, such soils have the potential to be expansive as they exhibit a moderate to high swell potential.

Project construction would be required to occur in accordance with typical building construction practices that comply with the CBC. Measures may include compaction, over-excavation, and slab-on-grade foundations. Compliance with the CBC would result in less than significant impacts associated with expansive soils.

e) *Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? **No Impact.***

The project would connect to the existing public sewer system. Septic tanks and alternative wastewater disposal systems would not be installed on the project site. Project implementation would not result in impacts to soils associated with the use of such wastewater treatment systems. No impact would occur.

f) *Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? **Less than Significant Impact.***

Underlying geology of the project area has been mapped as Quaternary alluvium and marine deposits dated to the Pliocene to Holocene (5.333–0 million years ago). This geologic deposit is described as alluvium, lake, playa, and terrace deposits of unconsolidated and semi-consolidated material. The project area lies within the boundaries of the now dry Lake Cahuilla, an ancient lake fed by waters of the Colorado River that existed periodically throughout the Pleistocene and Holocene until ultimately drying up around 400 years before present (ECORP 2020b).

Though the Lake Cahuilla bed deposits, on which the project rests, are known to contain fossils, such finds typically occur at depths greater than several meters and likely would not be encountered during project construction. In addition, the site has been previously graded and/or disturbed (i.e., prior agricultural use) and the on-site soil types (clays) are considered to have a low potential to yield significant paleontological resources. For these reasons, the project is not anticipated to adversely affect any unknown unique paleontological resource or geologic feature. Impacts are considered to be less than significant.

8. Greenhouse Gas Emissions

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

The following section is based on the *Air Quality, Greenhouse Gas Emissions, and Energy Consumption Assessment* prepared by ECORP Consulting, Inc. in March 2021 (2021; see Appendix A).

DISCUSSION OF IMPACTS

Certain gases in the earth's atmosphere, classified as greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming (ECORP 2021). Refer to Appendix A for additional discussion of global warming and climate change.

To date, neither the Imperial County Air Pollution Control District (ICAPCD) nor the City of El Centro have adopted GHG significance thresholds applicable to potential development. Section 15064.7(c) of the CEQA Guidelines specifies that a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the lead agency's decision is supported by substantial evidence. Thus, in the absence of any GHG emissions significance thresholds, the projected emissions are compared to the South Coast Air Quality Management (SCAQMD) numeric threshold of 3,000 metric tons of CO_2e (carbon dioxide equivalent) annually. While significance thresholds used in the South Coast Air Basin are not binding on the ICAPCD or El Centro, they are instructive for comparison purposes. This threshold is also appropriate as the SCAQMD GHG thresholds were formulated based on similar geography and climate patterns as found in Imperial County and are also employed for use in CEQA GHG analyses in the Riverside County portion of the Salton Sea Air Basin, the same air basin that encompasses the proposed project. Therefore, the 3,000 metric ton of CO_2e threshold is appropriate for analysis of the proposed project. The project was also assessed for consistency with regulations or requirements adopted by the 2008 Climate Change Scoping Plan and subsequent updates.

Where GHG emission quantification was required, emissions were modeled using CalEEMod, version 2016.3.2. CalEEMod is a statewide land use emissions computer model designed to quantify potential GHG emissions associated with both construction and operations from a variety of land use projects.

Construction-generated GHG emissions were calculated using a combination of model defaults for Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required. Operational GHG emissions were calculated using a combination of model defaults for Imperial County and an estimated a project trip generation rate of 1,320 average daily trips (Michael Baker International 2021; see Appendix E).

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.***

Construction and operation of project development would generate GHG emissions, with the majority of energy consumption (and associated generation of GHG emissions) occurring during the project's operation (as opposed to during its construction).

Construction

Construction-related activities that would generate GHG emissions include worker commute trips, haul trucks carrying supplies and materials to and from the project site, and off-road construction equipment (i.e., dozers, loaders, excavators). Table 8-1 illustrates the specific construction-generated GHG emissions. Once construction is complete, the generation of these GHG emissions would cease.

Table 8-1: Construction-Related Greenhouse Gas Emissions

Emissions Source	CO_2e (Metric Tons/Year)
Year 2021	498
Year 2022	309
Significance Threshold	3,000
Exceed Significance Threshold?	No

Source: ECORP 2021, see Appendix A; CalEEMod version 2016.3.2.

Notes: Construction-generated air pollutant emissions were calculated using a combination of model defaults for Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required (14,000 c.y. of cut material and 23,000 c.y. of fill material). Refer to Appendix A for Model Data Outputs.

As shown in Table 8-1, project construction would not exceed the significance threshold for GHG emissions. Impacts would be less than significant.

Operations

Project operation would result in an increase in GHG emissions primarily associated with motor vehicle trips and on-site energy sources. Long-term operational GHG emissions attributed to the project are identified in Table 8-2.

Table 8-2: Operational-Related Greenhouse Gas Emissions

Emission Source	CO_2e (Metric Tons/Year)
Area Source	2
Energy	687
Mobile	1,453
Waste	42
Water	152
Total	**2,336**
Significance Threshold	*3,000*
Exceed Significance Threshold?	***No***

Source: ECORP 2021, see Appendix A; CalEEMod version 2016.3.2.

Operational emissions were calculated using a combination of model defaults for Imperial County and an estimated project trip generation rate of 1,320 average daily trips. Refer to Appendix A for Model Data Outputs.

As shown in Table 8-2, the project would generate approximately 2,336 metric tons of CO2e per year during operations, which is below the significance threshold of 3,000 metric tons of CO2e per year. Therefore, impacts would be less than significant.

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 of El Centro does not currently have an adopted plan for the purpose of reducing GHG emissions. However, as previously described, the State of California promulgates several mandates and goals to reduce statewide GHG emissions, including the goal to reduce statewide GHG emissions to 40 percent below 1990 levels by the year 2030 and 80 percent below 1990 levels by the year 2050 (Senate Bill 32, or SB 32). The project is subject to compliance with SB 32. As discussed previously, the GHG emissions generated by the proposed project would not surpass GHG significance thresholds, which were prepared with the purpose of complying with these requirements.

Additionally, the project is consistent with regulations or requirements adopted by the 2008 Climate Change Scoping Plan and subsequent updates, pursuant to Assembly Bill 32 (AB 32). The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of SB 32 and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan (approved by CARB in 2008 and updated in 2014 and 2017) provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. The Scoping Plan is not directly applicable to specific projects, nor is it intended to be used for project-level evaluations. It does not provide recommendations for lead agencies to develop evidence-based numeric thresholds consistent with the Scoping Plan, the state's long-term GHG goals, and climate change science. Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (i.e., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (i.e., Low Carbon Fuel Standard), among others.

Table 8-3 highlights measures that have been, or will be, developed under the Scoping Plan and presents the project's consistency with Scoping Plan measures.

Table 8-3: Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Proposed Project Consistency
Transportation Sector		
Advanced Clean Cars	T-1	*Consistent*. The project's residents would purchase vehicles in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Low Carbon Fuel Standard	T-2	*Consistent*. Motor vehicles driven by the project's residents and customers would use compliant fuels.
Regional Transportation-Related GHG Targets	T-3	*Consistent*. The project would result in a GHG emissions per capita that is less than that project for the region within the Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy planning area.
Advanced Clean Transit	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
Last-Mile Delivery	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
Reduction in VMT	N/A	*Consistent*. According to the VMT analysis prepared for the project, the project would result in a GHG emissions per capita that is less than that projected for the county.
Vehicle Efficiency Measure 1. Tire Pressure 2. Fuel Efficiency Tire Program 3. Low-Friction Oil 4. Solar-Reflective Automotive Paint and Window Glazing	T-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Ship Electrification at Ports (Shore Power)	T-5	*Not applicable*. The project would not prevent CARB from implementing this measure.
Goods Movement Efficiency Measures 1. Port Drayage Trucks 2. Transport Refrigeration Units Cold Storage Prohibition 3. Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification 4. Goods Movement Systemwide Efficiency Improvements 5. Commercial Harbor Craft Maintenance and Design Efficiency 6. Clean Ships 7. Vessel Speed Reduction	T-6	*Not applicable*. The project would not prevent CARB from implementing this measure.

Table 8-3, continued

Scoping Plan Measure	Measure Number	Proposed Project Consistency
Heavy-Duty Vehicle GHG Emission Reduction • Tractor-Trailer GHG Regulation • Heavy-Duty GHG Standards for New Vehicle and Engines (Phase I)	T-7	*Not applicable*. The project would not prevent CARB from implementing this measure.
Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Proposed Project	T-8	*Not applicable*. The project would not prevent CARB from implementing this measure.
Medium- and Heavy-Duty GHG Phase 2	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
High-Speed Rail	T-9	*Not applicable*. The project would not prevent CARB from implementing this measure.
Electricity and Natural Gas Sector		
Energy Efficiency Measures (Electricity)	E-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Energy Efficiency Measures (Natural Gas)	CR-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Solar Water Heating (California Solar Initiative Thermal Program)	CR-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Combined Heat and Power	E-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Renewables Portfolio Standard (33% by 2020)	E-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Renewables Portfolio Standard (60% by 2030)	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
SB 1 Million Solar Roofs (California Solar Initiative, New Solar Home Partnership, Public Utility Programs) and Earlier Solar Programs	E-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Water Sector		
Water Use Efficiency	W-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Water Recycling	W-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Water System Energy Efficiency	W-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Reuse Urban Runoff	W-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Renewable Energy Production	W-5	*Not applicable*. The project would not prevent CARB from implementing this measure.

Table 8-3, continued

Scoping Plan Measure	Measure Number	Proposed Project Consistency
Green Buildings		
State Green Building Initiative: Leading the Way with State Buildings (Greening New and Existing State Buildings)	GB-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
Green Building Standards Code (Greening New Public Schools, Residential and Commercial Buildings)	GB-1	*Consistent*. The project would be constructed in accordance with Title 24 building standards.
Beyond Code: Voluntary Programs at the Local Level (Greening New Public Schools, Residential, and Commercial Buildings)	GB-1	*Consistent*. The project would be constructed in accordance with Title 24 building standards.
Greening Existing Buildings (Greening Existing Homes and Commercial Buildings)	GB-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
Industry Sector		
Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	I-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
Oil and Gas Extraction GHG Emissions Reduction	I-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Reduce GHG Emissions by 20% in Oil Refinery Sector	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
GHG Emissions Reduction from Natural Gas Transmission and Distribution	I-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Refinery Flare Recovery Process Improvements	I-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Work with the Local Air Districts to Evaluate Amendments to Their Existing Leak Detection and Repair Rules for Industrial Facilities to Include Methane Leaks	I-5	*Not applicable*. The project would not prevent CARB from implementing this measure.
Recycling and Waste Management Sector		
Landfill Methane Control Measure	RW-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
Increasing the Efficiency of Landfill Methane Capture	RW-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Mandatory Commercial Recycling	RW-3	*Consistent*. The project would include recycling during both construction and operation consistent with the requirements of the Title 24 Building Standards.
Increase Production and Markets for Compost and Other Organics	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Anaerobic/Aerobic Digestion	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Extended Producer Responsibility	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure.

Table 8-3, continued

Scoping Plan Measure	Measure Number	Proposed Project Consistency
Environmentally Preferable Purchasing	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Forests Sector		
Sustainable Forest Target	F-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
Motor Vehicle Air Condition Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	H-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
SF6 Limits in Non-Utility and Non-Semiconductor Applications	H-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Reduction of Perfluorocarbons (PFCs) in Semiconductor Manufacturing	H-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Limit High GWP Use in Consumer Products	H-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Air Conditioning Refrigerant Leak Test During Vehicle Smog Check	H-5	*Not applicable*. The project would not prevent CARB from implementing this measure.
Stationary Equipment Refrigerant Management Program–Refrigerant Tracking/Reporting/Repair Program	H-6	*Not applicable*. The project would not prevent CARB from implementing this measure.
Stationary Equipment Refrigerant Management Program–Specifications for Commercial and Industrial Refrigeration	H-6	*Not applicable*. The project would not prevent CARB from implementing this measure.
SF6 Leak Reduction Gas Insulated Switchgear	H-6	*Not applicable*. The project would not prevent CARB from implementing this measure.
40% Reduction in Methane and Hydrofluorocarbon (HFC) Emissions	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
50% Reduction in Black Carbon Emissions	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
Agriculture Sector		
Methane Capture at Large Dairies	A-1	*Not applicable*. The project would not prevent CARB from implementing this measure.

Source: ECORP 2021; see Appendix A.

As shown, the project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law and to the extent that they are applicable to the project. The project would not impede the attainment of the GHG reduction goals for 2030 or 2050 identified in Executive Order (EO) S-03-05 and SB 32. EO S-03-05 establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. SB 32 establishes a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40 percent below 1990 levels by December 31, 2030.

While there are no established protocols or thresholds of significance for that future year analysis, CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory toward meeting these long-term GHG goals, although the specific path to compliance is unknown. Additionally, CARB has expressed in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32 (ECORP 2021)." Additionally, CARB has indicated that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-03-05.

As discussed, the project is consistent with the GHG emission reduction measures in the Scoping Plan and would not conflict with the state's trajectory toward future GHG reductions. In addition, as the specific path to compliance for the state in regard to the long-term goals will likely require development of technology or other changes that are not currently known or available, specific additional mitigation measures for the project would be speculative and cannot be identified at this time. The project's consistency would assist in meeting the City's contribution to GHG emission reduction targets in California.

The project would therefore not interfere with implementation of the previously described GHG reduction goals for 2030 or 2050 or impede the state's trajectory toward the previously described statewide GHG reduction goals for 2030 or 2050. Impacts would be less than significant.

9. Hazards and Hazardous Materials

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
9. HAZARDS AND HAZARDOUS MATERIALS. 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 area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

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 Impact.***

The routine transport, use, and disposal of hazardous materials can result in potential hazards to the public through accidental release. Such hazards are typically associated with certain types of land uses, such as chemical manufacturing facilities, industrial processes, waste disposal, and storage and distribution facilities.

None of these uses are proposed by the project; rather, the project would consist of multi-family residential uses including 180 apartment units and associated amenities, the construction of which would not involve the transport, use, or disposal of hazardous materials aside from those normally associated with construction and maintenance activities. Small amounts of hazardous materials would be used during construction activities (equipment maintenance, vehicle fuels, solvents, etc.). Similarly, limited amounts of hazardous materials may be used for landscape and building maintenance over the long term.

Any use of hazardous materials would occur in compliance with applicable federal, state, and local standards associated with the use, handling, and/or disposal of hazardous materials. As such, the project would not create a hazard to the public or to the environment. Impacts are considered to be less than significant.

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.***

Construction

Project construction activities could result in the transport, use, and disposal of hazardous materials such as gasoline fuels, asphalt, lubricants, paint, and solvents. Although care would be taken to transport, use, and dispose of small quantities of these materials by licensed professionals, there is a possibility that upset or accidental conditions may arise which could release hazardous materials into the environment. Accidental releases of hazardous materials are those releases that are unforeseen or that result from unforeseen circumstances, while reasonably foreseeable upset conditions are those release or exposure events that can be anticipated and planned for.

Project construction activities would occur in accordance with all applicable local standards adopted by the City of El Centro, as well as state and federal health and safety requirements intended to minimize hazardous materials risk to the public, such as Cal/OSHA requirements, the Hazardous Waste Control Act, the California Accidental Release Protection Program, and the California Health and Safety Code.

Stormwater runoff from the site, under both construction and post-construction development conditions, would be avoided through compliance with NPDES regulations administered by the Colorado River Regional Water Quality Control Board (RWQCB). The project is required to prepare and implement a Construction General Storm Water Permit and stormwater pollution prevention plan (SWPPP) (refer to Section 10, Hydrology and Water Quality). The contractor would be required to implement such regulations relative to the transport, handling, and disposal of any hazardous materials, including the use of standard construction controls and safety procedures that would avoid or minimize the potential for accidental release of such substances into the environment. Standard construction practices would be observed such that any materials released are appropriately contained and remediated as required by local and state laws.

Operation

The project proposes multi-family residential uses, passive and active recreational uses, sewer/water connections, and access/circulation improvements typical of residential development. Due to their nature, these uses are not generally expected to involve the routine transport, use, or disposal of hazardous materials in substantial quantities.

Once the project is operational, hazardous material use associated with the residences, recreational uses, landscaping, and maintenance would be limited to private use of commercially available cleaning products, landscaping pesticides and fertilizers, and use of various other commercially available substances. Development of the project site is therefore anticipated to result in use of commercially available potentially hazardous materials or chemicals. The use of these substances is expected to occur in relatively small quantities and to be typical of that for residential uses and associated landscape maintenance and would be subject to applicable federal, state, and local health and safety laws and regulations intended to minimize health risk to the public.

Project conformance with existing local, state, and federal regulations pertaining to the routine transport, use, storage, or disposal of hazardous materials or hazardous wastes would ensure that potential adverse effects are minimized and that such substances are handled appropriately in the event of accidental release.

For the reasons above, the project is not anticipated to 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. Impacts would be less than significant.

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?* ***No Impact*****.**

See Responses 9(a) and 9(b) above for project-specific discussion. No schools are located within one-quarter mile of the project site. Therefore, no impact would occur in this regard.

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.***

Research of the California Department of Toxic Substances Control (DTSC) *Cortese List* Data Resources revealed that the project site is not located on a site listed as a hazardous materials site (DTSC 2020; SWRCB 2020). The Cortese List indicates that the project site contains no above- or belowground storage tanks, soil stains, or other types of potential hazards to the public. Therefore, no impact would occur.

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

The Imperial County Airport Land Use Commission has established a set of land use compatibility criteria for lands surrounding the county's airports. The Imperial County Airport Land Use Compatibility Plan (Imperial County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone. Uses within Zone B2 are considered to be subject to significant risk and noise exposure. However, as indicated by Figure 5.10-1, Imperial County Airport Noise Impact Area, of the City's General Plan EIR (City of El Centro 2003), the site is located outside of the noise contours for the airport, and therefore, significant noise effects on future residents of the development from airport operations are not anticipated.

The project as designed would not exceed height standards as set forth in Chapter 29 of the Code of Ordinances of the City of El Centro for the R3 zone, and therefore would not support any structural elements (i.e., greater than 150 feet in height) with the potential to obstruct or otherwise affect airport operations, thus avoiding a potential safety hazard. The proposed residential uses would not adversely affect airport operations if developed within Zone B2 or result in a safety hazard for people working or residing in the area. Further, the project would be subject to Federal Aviation Administration (FAA) airspace review prior to development.

The 1996 Imperial County Airport Land Use Compatibility Plan indicates that the majority of residential development is incompatible within a B2 zone, with the exception of some low-density residential developments that are potentially compatible with restrictions. It should be noted that the Imperial County Airport Land Use Commission previously reviewed the request to rezone the subject property as proposed and found that the rezone would be inconsistent with the Imperial County Airport Land Use Compatibility Plan. However, the City retains the authority to make a final consistency determination that may ultimately preside over the Airport Land Use Commission's decision as to the appropriateness of the requested rezone.

Following such a determination, it is not anticipated that the project would result in a safety hazard or excessive noise for people residing or working in the project area. Impacts would be less than significant.

f) *Would the project impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan? **Less than Significant Impact.***

The City of El Centro participates in implementation of the Imperial County Multi-Jurisdictional Mitigation Plan (MJMP) which is intended to provide guidance for responding to emergency situations through a coordinated system of emergency service providers and facilities (Imperial County 2020). The MJMP addresses planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies. The plan does not address normal day-to-day emergencies or routine procedures used in dealing with such emergencies. Rather, the plan focuses on potential large-scale disasters that represent unique situations requiring unusual emergency responses. Such threats addressed by the plan include major earthquakes, hazardous materials incidents, flooding, transportation, civil unrest, and threats to national security.

During construction, materials would be placed within the project boundaries adjacent to the active on-site area of construction to avoid any access conflicts in case of emergency evacuations. Direct access to the project site would be from N. 8th Street and from N. 10th Street. The project does not propose any components that would be anticipated to obstruct or conflict with emergency response or evacuation during project operations. No off-site roadway improvements are proposed that would alter existing circulation patterns. In addition, the project has been designed to recess the access gate at the southern entrance along N. 10th Street, thereby allowing vehicles to pull off of the road while waiting for the gate to open in order to avoid potential queuing or circulation along the roadway.

Any improvements needed to provide adequate access to the site would be subject to City review for the potential to interfere with emergency evacuation routes to ensure that access and circulation are maintained during the construction and operational phases. Additionally, the project would be subject to site plan review by City emergency services personnel to ensure that it would not result in components that potentially interfere with an emergency response plan or an emergency evacuation plan. Impacts are considered to be less than significant.

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**.*

Refer also to Section 20, Wildfire. The project site is located in a developed urbanized area generally supporting commercial development, as well as multi-family and single-family uses. According to CalFire's Hazard Severity Zone Map, the project site is not located in a zone designated as Very High Fire Hazard Severity (VHFHSZ) (CalFire 2020). Similarly, adjacent lands are not identified as being in a VHFHSZ. Therefore, the project area is not considered to be at high risk for wildfire events or the damage and public safety risks associated with such occurrences.

Similar to existing conditions, the project would be served by the City of El Centro Fire Department. The nearest fire station is located at 1910 N. Waterman Avenue, approximately 0.63 miles southwest of the site. Existing fire protection services are adequate to serve the project as proposed with applicant payment of the required development impact fees; no new facilities or personnel would be required as the direct result of project implementation. Therefore, it is not anticipated that the project would expose people or structures to a significant risk of loss, injury or death involving hazardous wildland fires. Impacts would be less than significant.

10. Hydrology and Water Quality

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
10. HYDROLOGY AND WATER QUALITY. 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 off-site;	☐	☐	☒	☐
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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

*a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? **Less than Significant Impact.***

Stormwater runoff (both dry and wet weather) generally discharges into storm drains and/or flows directly to creeks, rivers, lakes, and the ocean. Polluted runoff can have harmful effects on drinking water, recreational water, and wildlife. Stormwater characteristics depend on site conditions, e.g., land use, impervious cover, pollution prevention, types and amounts of best management practices (BMPs), rain events (duration, amount of rainfall, intensity, time between events), soil type and particle sizes, multiple chemical conditions, the amount of vehicular traffic, and atmospheric deposition. Major pollutants typically found in runoff include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogens, and bacteria.

The majority of stormwater discharges are considered nonpoint sources and are regulated by an NPDES Municipal General Permit or Construction General Permit. The Colorado River RWQCB administers the NPDES stormwater permitting program for construction activities for the project area. Construction activities disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity. As the project site is more than one acre in size, the City, as the lead agency, is required to submit a Notice of Intent to the RWQCB that covers the Construction General Permit prior to the beginning of construction. The project would comply with the requirements of the NPDES General Permit for the City (State Water Resources Control Board Order No. 2013-0001-DWG). The project would also be subject to the City's requirements for stormwater treatment (Ordinance Chapter 22, Article VII) which consist of the City's Jurisdictional Runoff Management Plan (JRMP) and the Post-Construction Stormwater Best Management Practice Standards Manual for Development Projects, which is Attachment A of the JRMP (City of El Centro 2015). Additionally, the project would implement BMPs in conformance with Chapter 22, Article VII, Division 1, Section 22-707 of the City's Municipal Code.

The Construction General Permit requires the preparation and implementation of a water quality management plan and a stormwater pollution prevention plan (SWPPP), both of which must be prepared before construction can begin. The water quality management plan outlines the project site design, source control, and treatment control of BMPs utilized throughout the life of the project. The SWPPP outlines all activities to prevent stormwater contamination, control sedimentation and erosion, and comply with Clean Water Act requirements during construction. Implementation of the SWPPP starts with the commencement of construction and continues through to the completion of the project. The SWPPP would identify site-specific construction BMPs to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater runoff from the project area. Potential construction BMPs may include the following:

- Minimization of disturbed areas to the portion of the project site necessary for construction
- Stabilization of exposed or stockpiled soils and cleared or graded slopes
- Establishment of permanent landscaping as early as feasible
- Removal of sediment from surface runoff before it leaves the project site by silt fences or other similar devices around the site perimeter
- Protection of all storm drain inlets on-site or downstream of the project site to eliminate entry of sediment
- Prevention of tracking of soil through use of a gravel strip or wash facilities at exits from the project area
- Proper storage, use, and disposal of construction materials
- Continual inspection and maintenance of all specified BMPs through the duration of construction

With conformance to such measures and adherence to state and local regulations, 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.

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 City of El Centro does not utilize its groundwater supply for consumption, as the underlying groundwater is too brackish in quality for human consumption and agricultural uses. Water service for the project would be supplied from the City's public water supply system rather than from groundwater, which would not result in a net deficit of aquifer volume or lowering of the groundwater table. Therefore, the project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Impacts would be less than significant.

c)i) 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 result in substantial erosion or siltation on- or off-site? ***Less than Significant Impact.***

The project would not alter the course of a stream or river because such features are Refer to Response 10(a), above. No rivers or streams are present on the project site, and therefore, no such features would be altered with the proposed development. The project would have the potential to result in additional sources of polluted runoff, including through construction and operational activities associated with the proposed residential development and parking lots, as well as other on-site improvements. Stormwater runoff from the project site would be routed to an existing off-site detention basin, located immediately north of the project site at the southwest corner of Treshill Road and N. 8th Street. The basin was constructed as part of the El Centro Town Center Phase I project and subsequently expanded to accept the increased flows. The detention basin has been designed to adequately accommodate stormwater runoff resulting with future development of the project site; the construction of additional on-site or off-site detention basins for the treatment of stormwater is therefore not required with project implementation.

Although development of the subject property would result in the addition of impervious surfaces on-site, the project would not substantially change existing drainage patterns, nor increase the rate or volume of stormwater runoff from the subject property. As stated, the project would be subject to the City's requirements for stormwater treatment (Ordinance Chapter 22, Article VII) which consist of the JRMP and the Post-Construction Stormwater Best Management Practice Standards Manual for Development Projects (City of El Centro 2015). Additionally, the project would implement BMPs in conformance with Article VII, Division 1, Section 22-707 of the City's Municipal Code. All proposed stormwater infrastructure improvements and site grading would be subject to City discretionary review and approval of a grading permit application. With conformance to such requirements, it is not anticipated that the project would result in substantial erosion or siltation on- or off-site. Project impacts would be less than significant.

c)ii) 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 substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? ***Less than Significant Impact.***

See Response 10(c)i., above for project-specific discussion. The project site is not located within a 100-year flood hazard area and is therefore not susceptible to flooding (FEMA 2008). Development of the site would not substantially change drainage patterns on-site or off-site, and no increase in the rate or amount of surface runoff would occur with the project. Impacts would be less than significant.

c)iii) *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 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 Impact.***

See Responses 10(a) and 10(c)i., above. The project has the potential to increase stormwater runoff with development of the site, as impervious surface area would increase, as compared to the current undeveloped condition. However, as noted above, stormwater runoff from the project site would be routed to an existing off-site detention basin designed to adequately accommodate stormwater runoff resulting with future development of the project site; the construction of additional on-site or off-site detention basins to accommodate stormwater from the site is therefore not required with project implementation. Additionally, the project would be required to implement an SWPPP and BMPs to ensure that stormwater quality is properly managed during the construction and operational phases. Project conformance with relevant state and local regulations would prevent substantial stormwater pollutant discharge from entering the City's existing storm drain system. Therefore, the project would not 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. Impacts would be less than significant.

c)iv) *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 create or contribute runoff water which would impede or redirect flood flows?* ***Less than Significant Impact.***

Refer to Responses 10(c)i and 10(c)ii, above. The project site is not in an area subject to flooding, and stormwater runoff can be accommodating by existing off-site facilities. The project would not impede or redirect flood flows such that any off-site properties would be adversely affected by stormwater runoff from the subject site. With compliance with applicable state and local drainage regulations and standards, the proposed project would not substantially alter the existing drainage pattern of the project site or substantially increase the rate or amount of surface runoff in a manner that would impede or redirect flood flows. Impacts would be less than significant.

d) *In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?* ***Less than Significant Impact.***

The project site is located in Zone X (Other Areas) as illustrated on Federal Emergency Management Act (FEMA) map panel 06025C1725C, which is outside of the FEMA-mapped 100-year floodplain (FEMA 2008). Therefore, the potential for on-site flooding is considered low.

Tsunamis are a type of earthquake-induced flooding that is produced by large-scale sudden disturbances of the sea floor. Tsunamis interact with the shallow sea floor topography upon approaching a landmass, resulting in an increase in wave height and a destructive wave surge into low-lying coastal areas. The site is located approximately 93 miles east of the Pacific Ocean. Therefore, the site is not located in a tsunami inundation area and inundation due to tsunami would not occur.

A seiche is a surface wave created when a body of water is shaken, usually by earthquake activity. Seiches are of concern relative to water storage facilities because inundation from a seiche can occur if the wave overflows a containment wall, such as the wall of a reservoir, water storage tank, dam, or other artificial body of water. Based on the distance between the site and large, open bodies of water, inundation of the site due to a seiche event is not anticipated.

As the potential for project inundation relative to flood hazard, tsunami, or seiche zones is low, it is not anticipated that project implementation would risk release of pollutants as the result of such events. Impacts would be less than significant.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? ***Less than Significant Impact.***

Refer to Responses 10(a), 10(c)i and 10(c)iii, above. As described, the project applicant would prepare and implement an SWPPP that would manage stormwater runoff during construction activities. The SWPPP would include site design and source control BMPs to ensure stormwater runoff and impervious areas are minimized. The use of the off-site detention basin is anticipated to meet the treatment and flow control requirements for post-construction BMPs. The project would comply with all relevant state and local water quality management requirements (i.e., the City's JRMP and Post-Construction Stormwater Best Management Practice Standards Manual for Development Projects) to ensure proper treatment and management of stormwater runoff generated on the project site. Infiltration would be maintained through project design, including use of the existing detention basin to the north, and would implement appropriate management practices, control techniques, system design and engineering methods, and other measures as appropriate. The project would not decrease the quality or increase the quantity or runoff discharging from the project site compared to existing conditions.

Water for the project would be supplied by the City's public water system. The project would connect to an existing 12-inch water line in N. 10th Street and does not include the use of groundwater wells. Therefore, it is not anticipated that the project would conflict with or obstruct implementation of a groundwater management program.

With compliance with local, state, and federal water quality and groundwater requirements, as applicable, the project would not conflict with a water quality control plan or sustainable groundwater management plan. Impacts would be less than significant.

11. Land Use and Planning

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
11. LAND USE AND PLANNING. Would the project:				
a) Physically divide an existing 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

*a) Would the project physically divide an existing community? **Less than Significant Impact.***

Under existing conditions, surrounding land uses include multi-family residential (Town Center Villa Apartments) to the west across N. 10th Street; vacant land adjacent to the north; multi-family residential development to the east, along with vacant land and active agricultural fields; and single-family rural residential uses to the south across Bradshaw Avenue. The existing El Centro Town Center commercial retail development is located farther to the west (part of Phase I of the Town Center project) and includes such stores as Target, 99 Cents Only store, and Lowe's Home Improvement.

The proposed multi-family development would be consistent with similar multi-family uses in the area and would not result in a land use that would conflict with or disrupt surrounding development patterns. The project does not require or propose the construction of new streets or the closure or redesign of any existing area roadways, nor would it have an adverse effect on area circulation patterns or access. Additionally, utility lines (i.e., water, sewer) would be extended into the site from existing lines currently located in adjacent streets. All utility lines serving the site would be undergrounded and would therefore not create a barrier or obstruction on-site or in the surrounding area.

For these reasons, it is not anticipated that the project would physically divide an existing community. Impacts would be less than significant.

*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? **Less than Significant Impact.***

The project as proposed would require a General Plan Amendment to change the existing General Plan land use designation from CG-General Commercial to High Density Residential. The project would also rezone the property from CG-General Commercial to R3-Multiple Family Residential. Although City approvals would be required to allow for the project as proposed, with such approvals, the project would not conflict with a land use plan, policy, or regulation applicable to the project site relative to land use and zoning.

The project would be required to demonstrate conformance with the Multi-Family Residential Zones design standards identified in City Municipal Code Chapter 29, Article II, Division 2, Residential Zones, as well as with Municipal Code Chapter 7, Building and Construction Regulations. Project design would be subject to the development standards identified for the Multi-Family Residential Zone relevant to architectural and site design, parking and circulation requirements, wall and fence design, landscaping, and exterior lighting, among other elements, to ensure compatibility and avoid potential conflict with surrounding land uses.

The Imperial County Airport Land Use Compatibility Plan (Imperial County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone. However, as indicated by Figure 5.10-1, Imperial County Airport Noise Impact Area, of the City's General Plan EIR (City of El Centro 2003), the site is located outside of the noise contours for the airport, and therefore, significant noise effects on future residents of the development from airport operations are not anticipated. As designed, project elements would not exceed height standards as set forth in Chapter 29, Zoning, of the City's Municipal Code for the R3 zone, and therefore, the project would not support features (i.e., greater than 150 feet in height) with the potential to obstruct or conflict with airport operations or indirectly interfere with public safety as a result.

The Imperial County Airport Land Use Commission previously reviewed the request to rezone the subject property to residential use (as is currently proposed) and found that the rezone would be inconsistent with the Imperial County Airport Land Use Compatibility Plan. However, the City retains the authority to make a final consistency determination that may ultimately preside over the Airport Land Use Commission's decision as to the appropriateness of the requested rezone. Refer to Response 9(e), above, for additional discussion.

Currently, there is no adopted habitat conservation plan or natural community conservation plan in the City of El Centro. Therefore, the project would not conflict with any such plan.

Based on the above conditions, the project would not 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. Impacts would be less than significant in this regard.

12. Mineral Resources

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
12. MINERAL RESOURCES. 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?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

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 of El Centro is generally built out with urban uses that are typically incompatible with surface mining and mineral extraction activities. Further, the General Plan does not provide for mining activity to occur (City of El Centro 2004). No mineral resources that would be of value to the region or to residents of the state have been identified on the project site (DOC 2018b). Therefore, no impact would occur.

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.***

Refer to Response 12(a), above. The project site is not delineated as a locally important mineral resource recovery site. Therefore, the project would not 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 would occur.

13. Noise

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
13. NOISE. 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 of 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 area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

The following analysis is based upon the *Noise Impact Assessment* prepared by ECORP Consulting, Inc., dated November 2020 (see Appendix D). More detailed background information on the fundamentals of noise, human response to noise levels, noise effects, and other such technical aspects are provided in Appendix D. The following represents a summary of the findings of the Noise Impact Assessment.

DISCUSSION OF IMPACTS

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 of applicable standards of other agencies? ***Less than Significant Impact***.

The following evaluation discusses sound levels in terms of the community noise equivalent level (CNEL) and equivalent noise level (Leq). CNEL is an average sound level during a 24-hour period. CNEL is a noise measurement scale that accounts for noise source, distance, single event duration, single event occurrence, frequency, and time of day.

Human reaction to sound between 7:00 p.m. and 10:00 p.m. is often as if the sound were actually 5 decibels dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m.[1] From 10:00 p.m. to 7:00 a.m., humans generally perceive sound as if it were 10 dBA higher due to the lower background level. Hence, the CNEL is obtained by adding an additional 5 dBA to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dBA to sound levels in the night from 10:00 p.m. to 7:00 a.m.

Because CNEL accounts for human sensitivity to sound, the CNEL 24-hour figure is always a higher number than the actual 24-hour average. L_{eq} is the average noise level on an energy basis for any specific time period. The L_{eq} for one hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound.

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[1] dBA = A-weighted sound level, which is the sound pressure level in decibels as measured on a sound level meter using the A weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.

L_{eq} can be thought of as the level of a continuous noise that has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

City of El Centro Noise Limits

The City of El Centro has established policies and regulations concerning the generation and control of noise that could adversely affect its citizens and noise-sensitive land uses. Section 17.1-8, Construction Equipment, of the City of El Centro Municipal Code indicates that no construction or repair work is to be performed on Sundays and holidays. Mondays through Saturdays, construction can only occur between the hours of 6:00 a.m. and 7:00 p.m. Additionally, no such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any 24 hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes. Under certain conditions, the City may grant a waiver to allow limited construction activities to occur outside of the limits described above.

The City's General Plan Noise Element is intended to guide in the development of noise regulations. The City uses land use compatibility standards when planning and making development decisions to ensure that noise producers do not adversely affect sensitive receptors. Table 13-1 summarizes the City's noise standards for various types of land uses. The standards represent the maximum acceptable noise levels and are used to determine potential noise impacts.

Table 13-1: City of El Centro Exterior Noise Level Limits

Zone[1]	Time of Day	One-Hour Average
Single-Family Residential Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	55 45
Multi-Family Residential Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	55 50
Commercial, Civic and Limited Use Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	60 55
Manufacturing Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	75 70

Source: City of El Centro 2020.

Notes: 1. Zones which exists on the abutting or nearby property at whose boundary the measurement is taken. The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. If the measured ambient sound level exceeds the applicable limit shown in the table, the allowable sound level shall be the ambient noise level minus 5 dB but not less than the sound level limit specified in the table.

Federal Interagency Committee on Noise (FICON)

The FICON thresholds of significance assist in the evaluation of increased traffic noise. The 2000 FICON findings provide guidance as to the significance of changes in ambient noise levels due to transportation noise sources. FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing and future noise-sensitive land uses (e.g., residential) are less than 60 dBA CNEL and the project creates a readily perceptible 5 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or

- If the existing noise levels range from 60 to 65 dBA CNEL and the project creates a barely perceptible 3 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the project creates a community noise level increase of greater than 1.5 dBA CNEL.

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for residential buildings (CCR Title 24, Part 2, Chapter 12, Section 1207.11.2). Title 24 establishes standards for interior room noise attributable to outside noise sources. Title 24 also specifies that acoustical studies should be prepared whenever a residential building or structure is proposed to be located in areas with exterior noise levels 60 dB L_{dn} or greater. The acoustical analysis must show that the building has been designed to limit intruding noise to an interior level not exceeding 45 dB L_{dn} for any habitable room. The provisions of the Title 24 standard apply to all new hotels, motels, apartments, and multi-family developments.

Noise- and vibration-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise- and vibration-sensitive and may warrant unique measures for protection from intruding noise. The nearest sensitive receptors to the project site are multi-family residences located to the east (across N. 8th Street) and west (across N. 10th Street) of the project site.

The most common and significant source of noise in the City of El Centro is mobile noise generated by transportation-related sources. Other sources of noise are the various land uses (i.e., residential, commercial and agricultural) that generate stationary-source noise. The project site is bound by vacant land to the north with Cruickshank Drive beyond, N. 8th Street to the east with multi-family residential units beyond, Bradshaw Avenue to the south with residential land uses beyond, and N. 10th Street and multi-family residential units to the west, with a commercial shopping center beyond.

Existing Ambient Noise Levels

To quantify existing ambient noise levels in the project area, three short-term noise measurements were taken on October 1, 2020. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site during the daytime (see Appendix D for a depiction of noise measurement locations). As shown in Table 13-2, the ambient recorded noise level directly adjacent to the project site ranges from 52.0 dBA to 55.7 dBA L_{eq}.

Table 13-2: Existing (Baseline) Noise Measurements

Location Number	Location	L_{eq} dBA	L_{min} dBA	L_{max} dBA	Time
1	Corner of Bradshaw Avenue and N. 10th Street	55.7	45.7	75.6	7:27 a.m.- 7:57 a.m.
2	Residential complex on N. 8th Street across from project site	61.3	46.6	75.6	8:04 a.m. – 8:34 a.m.
3	Intersection of N. 10th Street and Cruickshank Drive	52.0	36.6	79.2	8:45 a.m. – 9:15 a.m.

Source: ECORP 2020c; see Appendix D for noise measurement outputs.

The most common noise in the project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles). Traffic moving along streets produces a sound level that remains relatively constant and is part of the minimum ambient noise level in the project vicinity. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, trains, garbage, and construction vehicle activity and honking of horns. Such sources add to urban noise levels and are regulated by a variety of agencies.

Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the project vicinity. This task was accomplished using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic volumes from the Transportation Impact Study (Michael Baker International 2021; see Appendix E). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. Available Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along these roadway segments are provided in Table 13-3.

Table 13-3: Existing (Baseline) Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway
Cruickshank Drive		
Between Imperial Avenue and 12th Street	Residential and Commercial	55.7
Between 12th Street and 10th Street	Residential and Commercial	54.7
Bradshaw Road		
West of Imperial Avenue	Residential and Commercial	55.1
Between Imperial Avenue and 12th Street	Residential and Commercial	51.8
Between 12th Street and 10th Street	Residential	50.0
Between 10th Street and 8th Street	Residential	48.2
8th Street		
Between the project site driveway and Bradshaw Road	Residential	56.1
Between Bradshaw Road and El Dorado Avenue	Residential	56.7
South of El Dorado Avenue	Residential	56.4
10th Street		
Between Cruickshank Drive and the project site driveway	Residential	43.5
Imperial Avenue		
South of Bradshaw Road	Commercial and Religious	61.7

Source: ECORP 2020c; see Appendix D.

Notes:

1. Traffic noise levels were calculated by ECORP using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified in the Transportation Impact Study included in Appendix E. A total of 11 intersections were analyzed in the Transportation Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of the noise analysis.

As shown, the existing traffic-generated noise levels on project-vicinity roadways currently range from 43.5 to 61.7 dBA CNEL at a distance of 100 feet from the roadway centerline. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00

p.m. to 10:00 p.m. and a 10 dBA "weighting" during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. It should be noted that the modeled noise levels depicted in Table 13-3 may differ from measured levels in Table 13-2 because the measurements represent noise levels at different locations around the project site and are also reported in different noise metrics (e.g., noise measurements are the L_{eq} values and traffic noise levels are reported in CNEL

Construction

Construction noise associated with the proposed project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for on-site construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

Nearby noise-sensitive land uses consist of multi-family residential units located across N. 10th Street adjacent to the western project site boundary. There are also multi-family residences located directly across 8th Street to the east of the project site. As previously described, Section 17.1-8 of the City's Municipal Code states that it shall be unlawful for any person to operate construction equipment at any construction site on Sundays, and days appointed by the president, governor, or the City council for a public holiday. In addition, it shall be unlawful for any person to operate construction equipment at any construction site on Mondays through Saturdays except between the hours of 6:00 a.m. and 7:00 p.m.

No such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any 24-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

The anticipated short-term construction noise levels generated for the necessary construction equipment are provided in Table 13-4. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the project site (ECORP 2020c).

Table 13-4: Unmitigated Construction Average (dBA) Noise Levels at Nearest Receptor

Equipment	Estimated Exterior Construction Noise Level at Existing Residences	Construction Noise Standards (dBA L_{eq})	Exceeds Standards?
Site Preparation			
Tractors/Loaders/Backhoes (1)	62.0	75	No
Combined Site Preparation Equipment	*62.0*	*75*	*No*
Grading			
Graders (2)	63.0 (each)	75	No
Scraper (1)	61.5	75	No
Combined Grading Equipment	*67.3*	*75*	*No*
Construction, Trenching, Paving & Painting			
Forklift (1)	61.4	75	No
Tractors/Loaders/Backhoes (2)	62.0 (each)	75	No
Trencher (1)	54.1	75	No
Pavers (1)	56.1	75	No
Rollers (2)	54.9 (each)	75	No
Air Compressor (1)	55.6	75	No
Combined Construction, Trenching, Paving & Painting Equipment	*67.9*	*75*	*No*

Source: ECORP 2020c; see Appendix D.

Notes: Construction equipment used during construction derived from CalEEMod 2016.3.2. CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters. The nearest residence is located approximately 400 feet from the center of the construction site.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time- varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 13-4, no individual or cumulative pieces of construction equipment would exceed the 75 dBA City construction noise standard during any phase of construction at the nearby noise-sensitive receptors. Construction noise levels would not exceed established thresholds. Impacts would be less than significant and no mitigation measures are required.

Operation

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise sensitive and may warrant unique measures for protection from intruding noise. The nearest noise-sensitive land uses are multi-family residential units located to the west directly across N. 10th Street and to the east directly across N. 8th Street.

Operational Off-site Traffic Noise

Future traffic noise levels throughout the project vicinity (i.e., vicinity roadway segments that traverse noise-sensitive land uses) for the project were modeled based on the traffic volumes identified in the Transportation Impact Study (Michael Baker International 2021; see Appendix E) to determine the noise levels along project vicinity roadways. Table 13-5 shows the calculated off-site roadway noise levels under existing traffic levels compared to future buildout of the project. The calculated noise levels as a result of the project at affected sensitive land uses were compared to the FICON recommendation for evaluating the impact of increased traffic noise.

Table 13-5: Proposed Project - Predicted Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway		Noise Standard (dBA CNEL)	Exceed Standard AND result in Noise Levels Exceeding Acceptable Exterior Noise Standards
		Existing Conditions	Existing + Project Conditions		
Cruickshank Drive					
Between Imperial Avenue and N. 12th Street	Residential and Commercial	55.7	55.9	>5	No
Between N. 12th Street and N. 10th Street	Residential and Commercial	54.7	55.0	>5	No
Bradshaw Road					
West of Imperial Avenue	Residential and Commercial	55.1	55.1	>5	No
Between Imperial Avenue and 12th Street	Residential and Commercial	51.8	52.1	>5	No
Between 12th Street and 10th Street	Residential	50.0	50.4	>5	No
Between 10th Street and 8th Street	Residential	48.2	49.8	>5	No
N. 8th Street					
Between the project site driveway and Bradshaw Road	Residential	56.1	56.3	>5	No
Between Bradshaw Road and El Dorado Avenue	Residential	56.7	56.9	>5	No
South of El Dorado Avenue	Residential	56.4	56.5	>5	No
N. 10th Street					
Between Cruickshank Drive and the project site driveway	Residential	43.5	44.6	>5	No
Imperial Avenue					
South of Bradshaw Road	Commercial and Religious	61.7	61.7	>3	No

Source: ECORP 2020c; see Appendix D.

Notes:

1. Traffic noise levels were calculated by using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified in the Transportation Impact Study (see Appendix E).
2. A total of 11 intersections were analyzed in the Transportation Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of the noise analysis.

As shown in Table 13-5, no roadway segment would generate an increase of noise beyond the FICON significance standards. Operational noise from traffic would not result in a significant traffic noise impact. Impacts would be less than significant and no mitigation measures are required.

Cumulative traffic noise levels throughout the project vicinity (i.e., vicinity roadway segments that traverse noise-sensitive land uses) were also modeled based on the traffic volumes identified in the Transportation Impact Study (Michael Baker International 2021) to determine the noise levels along project vicinity roadways. Table 13-6 shows the calculated off-site roadway noise levels under cumulative conditions without the project (Cumulative No Project) compared to cumulative conditions plus future buildout of the project (Cumulative Plus Project). The calculated noise levels as a result of Cumulative Plus Project conditions at affected sensitive land uses were compared to the FICON significance standards.

Table 13-6: Cumulative Traffic Noise Scenario

Roadway Segment	Cumulative No Project	Cumulative Plus Project	Noise Standard (dBA CNEL)	Exceed Standard AND result in Noise Levels Exceeding Acceptable Exterior Noise Standards?
	CNEL @ 100 Feet from Roadway Centerline	CNEL @ 100 Feet from Roadway Centerline		
Cruickshank Drive				
Between Imperial Avenue and N. 12th Street	57.1	58.2	>5	No
Between N. 12th Street and N. 10th Street	56.4	58.6	>5	No
Bradshaw Road				
West of Imperial Avenue	56.2	57.0	>5	No
Between Imperial Avenue and N. 12th Street	52.3	52.6	>5	No
Between N. 12th Street and N. 10th Street	51.0	51.1	>5	No
Between N. 10th Street and N. 8th Street	50.1	53.1	>5	No
8th Street				
Between the project site driveway and Bradshaw Road	57.3	57.3	>5	No
Between Bradshaw Road and El Dorado Avenue	57.8	59.0	>5	No
South of El Dorado Avenue	57.5	57.6	>5	No
10th Street				
Between Cruickshank Drive and the project site driveway	46.3	46.9	>5	No
Imperial Avenue				
South of Bradshaw Road	63.0	63.0	>3	No

Source: ECORP 2020c: see Appendix D.

Notes:

1. Traffic noise levels were calculated using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified in the Transportation Impact Study; see Appendix E.
2. A total of 11 intersections were analyzed in the Transportation Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of the noise analysis.

As shown in Table 13-6, no roadway segment would generate an increase of noise beyond the FICON significance standards in any scenario. Therefore, no mobile-source cumulative impacts would occur.

Project Land Use Compatibility

The City uses the land use compatibility standards from the General Plan, which provide the City with a tool to gauge the compatibility of new land users relative to existing noise levels. Table 4-1, Noise/Land Use Compatibility Matrix, of Appendix D identifies acceptable noise levels for various land uses, including residential land uses such as those proposed by the project. In the case that noise levels identified at the project site fall within levels presented in the General Plan, the project is considered compatible with the existing noise environment.

A normally acceptable noise standard for residential land uses is 59 dBA CNEL or under. As previously stated, noise measurements were taken to quantify existing ambient noise levels in the project area. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site and are considered representative of the noise levels throughout the day. As shown in Table 13-2, the ambient noise levels recorded closest to the project site range from 52.0 dBA to 55.7 dBA.

Additionally, the roadway segment on N. 10th Street between Cruickshank Drive and the future project site driveway, which is adjacent to the northwestern boundary of the project site, has a calculated existing roadway noise level of 43.5 dBA CNEL at 100 feet from the centerline of the road, which extends onto the site. Further, the roadway segment on Bradshaw Avenue between N. 10th Street and N. 8th Street, which traverses the southern boundary of the project site, has a calculated existing roadway noise level of 48.2 dBA CNEL at 100 feet from the centerline of the road, which extends onto the site.

These modeled noise levels are reported in the noise metric, CNEL, which is the same noise metric promulgated by City noise compatibility guidelines identified in Table 4-1 of Appendix D. As these noise levels fall below the noise standard of 59 dBA CNEL, the project site is considered an appropriate noise environment to locate the proposed land use.

Operational On-site Noise

The primary operational noise source associated with the project would be that of stationary sources. Potential stationary noise sources related to long-term operation of residences on the project site would include mechanical equipment and other typical sources specific to urban residential land uses such as barking dogs, internal traffic circulation, radios, and people talking. According to reference field noise measurements taken, mechanical heating, ventilation, and air conditioning equipment generates noise levels less than 45 dBA at 20 feet, which is less than City's noise threshold for protecting residential uses (ECORP 2020c). Urban residential noise generally registers at 55 to 60 dBA. Based on field measurements conducted by ECORP on October 1, 2020, existing noise levels currently range from 52.0 dBA to 55.7 dBA directly adjacent to the project site (ECORP 2020c). Therefore, on-site project-generated noise would be expected to be similar to noise levels currently experienced.

The project would locate new residential uses adjacent to other similar existing residential uses. In minimizing potential adverse impacts on new land uses due to noise, a key approach is to avoid designating certain land uses at locations within the community that would negatively affect noise-sensitive land uses. The project is consistent with the types, intensity, and patterns of land use envisioned for the project area and is considered compatible with the existing noise environment.

Project operation would not result in a significant noise-related impact associated with on-site sources. Impacts would be less than significant and no mitigation measures are required.

b) *Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?* ***Less than Significant Impact.***

Construction

Construction activities can generate varying degrees of vibration, depending on the construction procedures and the type of construction equipment used. High levels of vibration may cause physical personal injury or damage to buildings. However, vibrations rarely affect human health. Instead, construction-related vibration impacts are typically associated with building damage. The operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. Unless heavy construction activities are conducted extremely close (within a few feet) to the neighboring structures, vibrations from construction activities rarely reach the levels that damage structures.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is noted that pile drivers would not be necessary during project construction. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the project site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 13-7.

Table 13-7: Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source : ECORP 2020c; see Appendix D.

The City of El Centro does not regulate vibrations associated with construction. However, for comparison purposes, the Caltrans (2020) recommended standard of 0.2 inch per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings. Consistent with Federal Transit Authority (FTA) recommendations for calculating construction vibration, construction vibration was measured from the center of the project site (ECORP 2020c). The nearest structures of concern to the construction site are located across N. 10th Street and across N. 8th Street.

Based on the representative vibration levels presented for various construction equipment types in Table 13-8 and the construction vibration assessment methodology published by the FTA (2018), potential project construction vibration levels were estimated. Table 13-8 presents the anticipated project generated vibration levels at a distance of 400 feet.

Table 13-8: Construction Vibration Levels at 400 Feet

Receiver PPV Levels (inches/second)[1]					Peak Vibration	Threshold	Threshold Exceeded?
Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Vibratory Roller			
0.00004	0.005	0.001	0.001	0.003	0.005	0.2	No

Source: ECORP 2020c; see Appendix D.

Notes: 1. Based on the Vibration Source Levels of Construction Equipment included on Table 5-3 (FTA 2018). Distance to the nearest residence is approximately 400 feet measured from the center of the project site.

As shown in Table 13-8, vibration as a result of construction activities would not exceed 0.2 PPV at the nearest structure. Thus, project construction would not exceed the recommended threshold. Therefore, the project would result in a less than significant impact related to construction vibration levels.

Operation

The project would not include significant stationary sources of vibration, such as heavy equipment operations. Operational vibration in the project vicinity would be generated by vehicular travel on the local roadways. Similar to existing conditions, traffic-related vibration levels would not be perceptible by sensitive receptors. Therefore, the project would result in a less than significant impact related to operational vibration levels.

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

The project site is not located within 10 miles of an active private airstrip and noise levels generated at private airports are not audible at the project site. Therefore, no impact would occur related to the exposure of people residing or working in the project area to excessive noise levels from a private airstrip.

The Imperial County Airport is located approximately 1.8 miles northwest of the project site. The Imperial County Airport Land Use Commission has established a set of land use compatibility criteria for lands surrounding the county's airports. The Imperial County Airport Land Use Compatibility Plan (Imperial County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone. Uses within Zone B2 are considered to be subject to significant risk and noise exposure; however, such uses would not adversely affect airport operations if developed within the zone. As indicated by Figure 5.10-1, Imperial County Airport Noise Impact Area, of the City's General Plan EIR (City of El Centro 2003), the site is located outside of the noise contours for the airport, and therefore, significant noise effects on the proposed development from airport operations are not anticipated.

The project would not expose people residing or working in the project area to excessive noise levels. A less than significant impact would occur.

14. Population and Housing

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

DISCUSSION OF IMPACTS

*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)? **Less than Significant Impact.***

The project as proposed would require a General Plan Amendment to change the existing General Plan land use designation on a portion of the site from General Commercial to High Density Residential. The project would also rezone a portion of the property from CG-General Commercial to R3-Multiple Family Residential. The existing General Commercial land use and CG-Commercial zoning would continue to apply to the remainder of the property, which is proposed to be subdivided to allow for future commercial development (not proposed for development at this time).

Although the project would change the current land use type from commercial to residential, development of the subject site was anticipated by the City as Phase IV of the Town Center Village project and therefore does not represent unplanned growth. Further, the project as proposed would result in multi-family (apartment) uses similar to that which have been constructed just to the west of the site along N. 10th Street. With implementation, the project would provide new housing opportunities within an area of the City where planned development is currently underway and expanding.

The project would allow for development of 180 multi-family residential units, which would be a mixture of one- and two-bedroom units. Based upon the current estimated persons per household for the City of El Centro (3.74 persons per household), an estimated 673 residents would be housed by the development (US Census Bureau 2019). The population generated by future development of the site as proposed would therefore not represent substantial population growth within the City. Additionally, it is assumed that many residents that would live in the proposed development would be existing residents of the City of El Centro that would relocate to the site. It is also anticipated that some of the future residents would be students attending Imperial Valley College, located approximately 3.5 miles northeast of the project site, who may be either local residents or residents from surrounding communities.

The project does not propose the construction of any new roadways that would provide access to land areas previously inaccessible. Additionally, all infrastructure (water, sewer, stormwater, electricity) is already present in the project vicinity and serves adjacent properties under existing conditions. The project would therefore not result in the provision of new access or infrastructure to areas where such facilities were not already available.

Based on the above, the project would not induce substantial unplanned population growth in the area, either directly or indirectly. Impacts would be less than significant.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? ***No Impact.***

The project would not require the removal or replacement of any existing housing or residents as the subject site does not currently support any residential uses. Therefore, no impact would occur.

15. Public Services

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
15. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the 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 following public services:				
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the 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 following public services:

a) Fire protection? ***Less than Significant Impact.***

The project would be served by the El Centro Fire Department (ECFD). The ECFD provides emergency and disaster response to mitigate fire, emergency medical, hazardous materials, and other incidents within its boundaries as well as to other jurisdictions via a mutual aid agreement. Fire Station No. 3 is nearest to the project site, located approximately 0.7 miles west at 1910 N. Waterman Avenue. It is not anticipated that the addition of 180 multi-family residential units to the ECFD service area would require the construction of new or expansion of existing facilities to provide service to the project as proposed.

The EFCD maintains a staffing standard providing that 10 sworn and uniformed personnel are available to respond to calls at any given time throughout the day or night (City of El Centro 2016). There is currently no standard that dictates the total number of personnel on staff relative to City population.

The ECFD has adopted standards for fire and emergency response performance based on the National Fire Protection Association Standard 1710 (2010 Edition) - Standard for the Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments. The ECFD standards require that they meet such adopted response times at least 90 percent of the time (City of El Centro 2016).

Although the project would not substantially alter the ECFD's ability to provide fire protection services to the project site, constructing new residences on the site would increase the demand on ECFD services, personnel, and equipment, adding new demand for emergency and non-emergency service responses. As such, the project applicant would be required to pay development impact fees in proportion to the development proposed to help fund fire protection services in the City. Additionally, the ECFD operates and shall continue to operate under mutual aid agreements with other agencies as-needed for assistance and backup (City of El Centro 2016). With the payment of development impact fees, the project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable fire protection service ratios, response times, or other performance objectives. Impacts would be less than significant.

b) Police protection? ***Less than Significant Impact.***

Police protection services for the project site would be provided by the El Centro Police Department (ECPD). The ECPD is headquartered at 150 N. 11th Street, approximately 1.25 miles south of the project site.

The project as proposed would present an increase in demand on ECPD personnel and resources due to the increased intensity of use on the site with development of 180 new multi-family units. A greater number of homes and residents in the project area would be a potential source of additional calls for police protection services.

The City's General Plan Public Facilities Element identifies the goal of maintaining a staffing goal of 1.75 sworn officers per 1,000 City residents (City of El Centro 2004). In addition, the ECPD staffing goal is to have a minimum of five police personnel on duty, including four responding officers and one supervising sergeant or officer-in-charge at any given period throughout the day and night (City of El Centro 2016).

The project would consist of 180 residential units, which are estimated to house a future population of approximately 673 residents, assuming 3.74 persons per household (US Census Bureau 2019). The increase in demand for the provision of law enforcement generated by an additional 673 residents within the El Centro community is not considered to be substantial.

The ECPD does not maintain response time goals. However, the department tracks and reviews response times on an annual basis to determine the adequacy of its service and any possible alterations or improvements to methods that would reduce response time (City of El Centro 2016).

To compensate for an increase in law enforcement costs resulting from increased service demand generated by the project, the developer would be required to pay development impact fees. With the payment of development impact fees, the project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable law enforcement service ratios, response times, or other performance objectives. Impacts would be less than significant.

c) Schools? ***Less than Significant Impact.***

Residents in the City of El Centro are served by three school districts in a total of 18 schools geographically dispersed throughout El Centro. These districts are the El Centro Elementary School District, the McCabe Union School District, and the Central Union High School District. Two charter schools are also located in the City and operated by the El Centro Elementary School District (City of El Centro 2016). School-age students residing in the proposed multi-family units constructed would enroll in El Centro Elementary School District for grades kindergarten through 8th grade and Central Union High School District for grades 9 to 12.

To assist in determining suitable future school locations, inclusion of a school site into a development or identification of a proper site within City limits may be required if a certain threshold number of units of new residential development is surpassed. Schools in the City are generally constructed for a school year enrollment of 600 students. The three school districts have their own student yield rates (average number of students per dwelling unit) that range from 0.21 to 0.66 students per dwelling unit (City of El Centro 2016). According to the Office of Public School Construction, the state yield is 0.69 students per dwelling unit. To standardize the student yield rate, the City's Service Area Plan utilizes the state rate of 0.69 students per dwelling unit. Therefore, each school of 600 students supports an estimated 870 residential units. The estimated 870 units serve as the threshold number considered to require a proposed development project to incorporate a school on-site or to identify a site within the City's limits. The 180 multi-family units proposed with the project would yield an estimated 124 students (at 0.69 students/dwelling unit) and would not trigger the need for a new school facility.

To offset the educational costs associated with increased enrollment in the school districts, the project applicant would be required to pay state-mandated school impact fees. Prior to the issuance of building permits, the project applicant would provide funding to the El Centro and Central Union High School Districts in accordance with Government Code Section 65996 and SB 50. Government Code Section 65996 states that payment of development fees is deemed to be full and complete school facilities mitigation. Impacts in this regard would be less than significant.

d) *Parks?* ***Less than Significant Impact.***

The project would construct 180 multi-family units (estimated 673 residents) that would place additional demand on existing City park facilities. The City General Plan Public Facilities Element identifies the goal of providing 3 acres of public parkland per 1,000 residents (City of El Centro 2004). Therefore, the project would result in new demand for an additional 2 acres of parkland (City of El Centro 2016).

According to the General Plan, the City operates at a deficit of parkland within its jurisdiction. In addition to parkland required to meet current demands, future growth of the City would continue to require acquisition of additional parkland to meet its performance standard at anticipated buildout of the General Plan.

To make up for the existing parkland demand and to accommodate anticipated future population increase, the City requires that new development include provision of additional public parks and recreational facilities to the maximum extent allowed by law in accordance with Public Facilities Policy 1.2 of the General Plan (City of El Centro 2004). The City would require the project applicant to pay a fair-share park impact fee in lieu of the dedication of parkland in conformance with Section 24, Article V of the City of El Centro Code of Ordinances. With the payment of development impact fees, the proposed project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable park service ratios or other performance objectives. Impacts would be less than significant.

e) *Other public facilities?* ***Less than Significant Impact.***

The nearest City library to the subject site is the City of El Centro Public Library, approximately 0.6 miles southwest at 1140 N. Imperial Avenue. Services provided by the library include circulation of library materials such as books, magazines and video and audio recordings; reference service; internet access; word processing stations; copy machines; a publicly available conference room; children's reading programs; vocal, acting, and speaking workshops for children and adults; and tax preparation assistance for senior citizens.

The Imperial County Local Agency Formation Commission requires that the library facilities section of the City's Service Area Plan maintain a performance standard measured in demand for square feet. The performance standard for the City is a range of 300 to 600 square feet of library facility space per 1,000 residents (0.30 to 0.50 square feet of library facility space per capita) (City of El Centro 2016).

The project would construct 180 multi-family units, whose residents would place demand on existing City library facilities. As the project is expected to generate 673 residents, the project would create demand for an additional 202 to 337 square feet of library space.

The City would require that the project applicant pay development impact fees to ensure that library service remain adequate to serve the City's population over the long term. With the payment of development impact fees, the project would not result in a substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable performance objectives. Impacts would be less than significant.

16. Recreation

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporation	Less Than Significant Impact	No Impact
16. RECREATION				
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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

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.***

As stated above, the project is anticipated to generate 673 residents. It is anticipated that a portion of project occupants would relocate to the development from other areas of El Centro, and therefore, would not all be new residents to the City.

Common open space provided on-site would meet the City's requirement of 150 square feet of common space per residential unit for the proposed R3-Multiple Family Residential zone. The development would offer a number of on-site opportunities for both passive and active outdoor recreation. As shown on Figure 3A, Site Plan, a series of common open space areas would be provided adjacent to the majority of the individual buildings on-site for resident use. Additionally, a private dog park is proposed in the eastern portion of the property, adjacent to N. 8th Street. Other recreational amenities for use by residents and their guests include a clubhouse, a recreational area with an outdoor pool and hot tub, and a barbecue/fire pit with outdoor seating. Therefore, it is not anticipated that the project would substantially increase demands on existing area neighborhood or regional parks or other recreational facilities, or contribute to a substantial deterioration of such facilities as a result. Impacts would be less than significant.

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.***

Refer to Response 16(a), above. The project proposes a variety of active and passive recreational amenities on-site that would be available for use by residents of the development and that would meet City requirements for the provision of common space.

The potential physical effects that could result from construction of these facilities are discussed throughout this IS/MND and, where necessary, mitigation measures are provided to ensure that impacts are reduced to less than significant. It is not anticipated that the project would directly require the construction or expansion of off-site recreational facilities that may have an adverse physical effect on the environment. Therefore, impacts are considered to be less than significant in this regard.

17. Transportation

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
17. TRANSPORTATION. Would the project:				
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 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?	☐	☐	☒	☐

The following evaluation is based on the *Transportation Impact Study* prepared for the project by Michael Baker International (2021; see Appendix E).

DISCUSSION OF IMPACTS

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 Impact.***

Within the project vicinity, there are no sidewalks provided on either side of Imperial Avenue (SR 86). Sidewalks are provided on both sides of Cruickshank Drive between Waterman Avenue and N. 8th Street. To the east of Waterman, there is a gap in the sidewalk between La Brucherie Road and Waterman Avenue (approximately 0.25 miles) on the north side of the street; however, continuous sidewalks are provided on the south side of the street. Sidewalks are provided on both sides of Bradshaw Avenue between La Brucherie Road and Imperial Avenue; however, there is an approximately 430-foot gap on the south side of the street to the west of Waterman Avenue. Between Imperial Avenue and N. 8th Street, sidewalks are only provided on the north side of the street. Sidewalks are provided on both sides of 8th Street south of Bradshaw Avenue. Between Bradshaw Avenue and the City limits to the north, sidewalks are only provided on the west side of N. 8th Street and N. 10th Street.

There are currently no bicycle facilities provided along the project frontage on N. 10th Street and Bradshaw Avenue. Class II bike lanes are provided on Cruickshank Drive and N. 8th Street. According to the City of El Centro Bicycle Master Plan (October 2010), Imperial Avenue is classified as a Class III Bicycle Route within the project vicinity; however, there are no signs or markings posted on the roadway stating such.

Imperial Valley Transit (IVT) operates the local bus service within the City of El Centro and provides access to employment centers, shopping centers, hospitals, the library, and government offices, as well as Imperial Valley College. The El Centro Green Line travels along Bradshaw Avenue, which allows transfer at the transit station located at State Street and N. 7th Street. This transit station also serves the citywide Blue Line as well as other regional IVT bus routes connecting Imperial, Brawley, Calexico, and the rest of Imperial Valley. The nearest bus stop to the project site is located on

Cruickshank Drive, approximately 500 feet east of Imperial Avenue. No changes to the existing bus stop are proposed with the project.

As shown in Figure 3A, Site Plan, no off-site road improvements are proposed. As such, the project would not impact existing or proposed transportation facilities, such as sidewalks, bicycle lanes, or public transportation stops. The project does not propose any features that would be inconsistent with applicable policies of the City's General Plan, Bicycle Master Plan, or other relevant plans addressing the circulation system.

Therefore, the project 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.

b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b)? ***Less than Significant Impact.***

The City of El Centro is currently in the process of developing its own vehicle miles traveled (VMT) thresholds and guidelines; however, as the guidelines have not been adopted at the time of the preparation of this IS/MND, the VMT analysis prepared for the project herein is based on Office of Planning and Research's (OPR) *Technical* Advisory *on Evaluating Transportation Impacts in CEQA* (December 2018). VMT is a measure of the total number of miles driven for various purposes and is sometimes expressed as an average per trip or per person.

The Technical Advisory includes screening criteria for all land development projects. A project that meets at least one of the screening criteria would have a less than significant VMT impact due to project characteristics and/or location. Analysis in the Transportation Impact Study concluded that the project meets the screening criteria of a project located in a VMT Efficient Area, which is an area with VMT more than 15 percent below the regional average VMT. Since at least one of the VMT screening criteria is satisfied, a detailed VMT analysis is not required, and the proposed project is presumed to have a less than significant transportation impact. The following text substantiates the VMT Efficient Area designation.

According to the Technical Advisory, the metric for evaluating VMT for residential projects is Home Based VMT per Capita. The City of El Centro is currently updating its 2040 General Plan. As part of this effort, the Imperial County Transportation Model (ICTM) Base Year 2014 was utilized to establish the baseline VMT in the City and Imperial County region. Based on modeling efforts conducted for the General Plan, the Imperial County baseline (2014) Total Home Based VMT is 2,192,401 with a population of 183,309. Therefore, the regional Home Based VMT/capita is 11.96 (2,192,401/183,309). As noted above, the Technical Advisory suggests a threshold of significance of 15 percent below the baseline condition. As such, the threshold of significance for Imperial County is 10.17 VMT/capita.

Using the baseline (2014) ICTM, the Home-Based VMT/capita was extracted for the traffic analysis zone (TAZ) where the project is located. Since the existing TAZ has a very low number of residential units (10 households), the residential VMT/capita for TAZs within a one-mile radius of the project site was also extracted to compare and validate the VMT for the project TAZ.

The Home Based VMT per capita for each TAZ was compared to the threshold of significance to determine if the project TAZ and the area surrounding the project TAZ are considered to be VMT efficient (85 percent of the regional average). As shown in Table 17-1, all but one of the TAZs near the project site below the threshold of significance. It is reasonable to assume the project is located within a VMT efficient area and as such satisfies the VMT Efficient Area screening criteria.

Table 17-1: VMT/Capita for TAZs within One Mile of Project Site

TAZ	Total Home-Based VMT/Capita	Threshold (85% of Regional Average)[1]	Above or Below Threshold of Significance?	Consider VMT Efficient & Less-Than-Significant?
14037101	8.38	10.17	Below	Yes
14026102	5.88		Below	Yes
14046102	10.94		Above	No
14037103	9.77		Below	Yes
14026101	6.64		Below	Yes
14037201	7.85		Below	Yes
14037202	7.61		Below	Yes
14033101	3.33		Below	Yes
14040101	6.52		Below	Yes
14050101	7.65		Below	Yes
14033102	5.74		Below	Yes
14040201	6.03		Below	Yes
Average	**7.20**	**60%**	**Below**	**Yes**

Source: Transportation Impact Study, Michael Baker International, 2021; see Appendix E.

[1] Regional Home Based VMT/Capita in Imperial County is 11.96. Threshold of significance is 85% of Regional Average.

As the project meets at least one of the screening criteria set by OPR, the project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, Subdivision (b). Impacts would be less than significant.

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 design does not propose any features that would construct or modify local roads that would potentially increase hazards. No new roadway design or features (i.e., sharp curves, dangerous intersections, or other hazardous features) would be required that could result in transportation-related hazards or safety concerns. As shown in Figure 3A, Site Plan, no off-site road improvements are proposed.

The project would be served by three driveways with two driveways on N. 10th Street and one driveway on N. 8th Street. The project driveway on N. 8th Street and the southern driveway on N. 10th Street would be full access driveways with gates. The northern driveway on 10th Street would be configurated as an exit-only access and would be gated. These access points would be designed in accordance with the City's street standards that ensure safe ingress/egress. Analysis in the Transportation Impact Study found that the sight distance for N. 8th Street and N. 10th Street is equal to or greater than the required sight distance and drivers exiting from the project site have adequate visibility at the project driveway. Additionally, on-site structures would be set back from adjacent access roadways as required by the City's Zoning Code to ensure that views at the driveways are uninhibited.

The project would result in residential development of the subject site. No uses that would involve farm equipment or heavy machinery are proposed.

Therefore, the project would not substantially increase hazards due to a geometric design feature or incompatible uses. Impacts related to the project's design features would be less than significant.

d) Would the project result in inadequate emergency access? ***Less than Significant Impact.***

Construction of the project would not result in inadequate emergency access. The project would be designed to meet City and fire department standards for emergency access and circulation. The proposed project would not alter any established emergency vehicle routes or otherwise interfere with emergency access.

All construction would be staged on-site and would not interfere with emergency access to the site. As noted above, the project site would have multiple ingress/egress points along N. 8th Street and N. 10th Street. The project site and vicinity are accessible via a number of existing roads, with alternative roads allowing access in the event of an emergency. Emergency vehicle access would be maintained throughout construction activities, in accordance with the City's construction specifications. Further, construction activities would not be permitted to impede emergency access to any local roadways or surrounding properties. A traffic control plan would be prepared to ensure that adequate access and circulation is maintained on all surrounding streets during the project construction phase. As such, construction impacts are considered to be less than significant.

Project operation would not result in inadequate emergency access. As mentioned above, the project site would have multiple ingress/egress points along N. 8th Street and N. 10th Street. These access points would be gated and designed in accordance with the City's street standards that ensure safe ingress/egress. Access gates along N. 10th Street would be recessed to allow cars to pull in and wait for the gate to open so as not to impede traffic flows along the roadway. All gates would have a Knox Box, or similar system, to allow emergency personnel to access the site at any time in case of an emergency. As such, operation impacts are considered less than significant.

Therefore, the project would not result in inadequate emergency access. Impacts would be less than significant.

18. Tribal Cultural Resources

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
18. TRIBAL CULTURAL RESOURCES. Would the project cause 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, that is:				
a) Listed or eligible for listing in the California Register if Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?; or,	☐	☒	☐	☐
b) 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 3024.1. In applying the criteria set for in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe?	☐	☒	☐	☐

The following discussion considers the findings of the *Cultural Resources Inventory* prepared by ECORP (2020b; see Appendix C).

DISCUSSION OF IMPACTS

a) *Would the project cause 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, that is listed or eligible for listing in the California Register if Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?* ***Less than Significant with Mitigation Incorporated.***

California State AB 52 (Chapter 532, Statutes of 2014) establishes a formal consultation process for California Native American tribes as part of CEQA and equates significant impacts on tribal cultural resources with significant environmental impacts (California Public Resources Code Section 21084.2).

The project site is currently undeveloped. As discussed in Section 5, Cultural Resources, the site does not support any listed or eligible historical or cultural resources, as defined by Public Resources Code Section 5020.1(k). A cultural resources inventory was conducted for the project by ECORP Consulting (2020b; Appendix C). ECORP requested a records search for the property at the South Coastal Information Center of the California Historical Resources Information System at San Diego State University. No previously recorded resources were identified within the project area. In addition, ECORP contacted the California Native American Heritage Commission (NAHC) to request a search of the Sacred Lands File for the area of potential effect (APE). The search was negative and no Native American cultural resources were identified within the project area. Additionally, the entire project area was field surveyed on October 14, 2020. No cultural or tribal cultural resources were identified as a result of the field survey.

Pursuant to AB 52, the City initiated consultation with culturally affiliated tribes by sending initial notification letters on September 15, 2020. The City received one letter from the Jamul Indian Village of California in response to the notifications sent. The Tribe indicated that while the project site does not lie within the boundaries of the recognized Pala Indian Reservation, it does lie within the boundaries of the territory that the Tribe considers to be its Traditional Use Area. The Tribe requested further notification of any construction or ground disturbance.

While no specific tribal cultural resources that could be impacted by the project have been identified, mitigation measure **CUL-1** would be implemented to reduce potential impacts to unknown tribal cultural resources, including human remains, to less than significant.

b) Would the project cause 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, that is 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 3024.1? In applying the criteria set for in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe? ***Less than Significant Impact with Mitigation Incorporated.***

As noted above, while no specific tribal cultural resources that could be impacted by the project have been identified, mitigation measure **CUL-1** to reduce potential impacts to unknown tribal cultural resources, including human remains, to less than significant. Pending the outcome of consultation, these mitigation measures may be revised or additional mitigation may be implemented.

Mitigation Measures

Implement Mitigation Measure **CUL-1**.

Level of Significance after Mitigation:

Less than significant.

19. Utilities and Service Systems

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
19. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication 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 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?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) *Would the project require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?* ***Less than Significant Impact.***

According to the City's Service Area Plan (2016), the City purchases its untreated water from the Imperial Irrigation District (IID), which is conveyed to City facilities from the Colorado River via the IID's canal system. City facilities are developed and maintained by the Department of Public Works.

The average daily demand on the City's water system is approximately 8.6 million gallons per day (mgd) and the maximum daily demand is approximately 13.8 mgd. The existing storage and conveyance capacity of 21 mgd is sufficient for existing daily water demand and peak flow requirements through the planning horizon year 2025 and can be expanded in 21 mgd increments to provide the maximum daily demand of 42 mgd and ultimately 63 mgd (City of El Centro 2016). The system also has adequate capacity to accommodate anticipated near-term development. The City continues to make periodic improvements to modernize the facilities and materials over time. Any expansions would be considered when the maximum daily demand approaches 21 mgd (City of El Centro 2016).

The project would connect to an existing 12-inch water line in N. 10th Street. The existing water line would be adequate to serve the project site and no upgrades to or expansion of existing facilities would be required to serve the project as proposed.

Additionally, according to the City's Service Area Plan (2016), capacity of the City's wastewater treatment plant (WWTP) is 8.0 mgd. Current generation from City wastewater customers averages approximately 3.4 mgd, and existing peak flow is approximately 6 mgd. The WWTP consistently meets Secondary Treatment Standards and has adequate capacity to handle existing flows. As such, the facility operates at approximately 50 percent capacity (City of El Centro 2016). It is anticipated that the WWTP and delivery system would meet demand of growth through 2026, as well as that future expansion would be required when the monthly flow reaches 6.4 mgd, or 80 percent of the plant's capacity of the 8.0 mgd. Planned improvements to expand the WWTP and delivery system were considered during the 2016 update of the City's Sewer Master Plan. It is anticipated that provision of wastewater collection to the ultimate service area will require additional treatment capacity and extension of the wastewater collection and transmission system. The City has acknowledged such conditions and improvements may be required on a project-by-project basis by developers to identify the need for any upgrades (City of El Centro 2016).

The proposed project would connect to an existing 36-inch sewer line located in N. 10th Street. No expansion of or upgrades to existing facilities would be required to adequately serve the proposed residential uses.

In general, the City of El Centro drains in a northeasterly direction and is tributary to the Salton Sea. The City maintains its Drainage Master Plan to ensure that stormwater facilities are maintained over time and that new development is adequately served. The City reviews specific drainage needs on a project-by-project basis. Stormwater from the project site would be routed to an existing storm drain located in N. 10th Street. This storm drain outlets to an existing off-site detention basin, located north of the project site at the southwest corner of the intersection of N. 8th Street and Treshill Road. This detention basin was previously constructed as part of the El Centro Town Center Village project and was sized to accommodate all planned development within the Town Center Village. Further, drainage design for the project would not result in a change in stormwater volume, rate, or direction of flow from the site following project implementation; refer to Section 10, Hydrology and Water Quality. Therefore, no upgrades to the City's storm drain system would be required to accommodate stormwater runoff from the subject site with project implementation.

Electricity would be provided by IID. Lands adjoining the subject site are currently served by IID and the project would connect to the existing system for service. Natural gas is provided by Southern California Gas Company and telecommunication services currently exist in the area. Such services would be extended to the site to support project operation. No expansion or upgrades to these utility systems are required to serve the project site.

Therefore, the project would not require or result in the relocation or reconstruction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects. Impacts in this regard would be less than significant.

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?* ***Less than Significant Impact.***

The project site is currently undeveloped, and therefore, project-related development would increase demand for City water services. The City of El Centro would provide sewer services to the project site through connections to an existing line.

As stated above, the existing storage and conveyance capacity of the City's water storage system of 21 mgd is sufficient for the daily water demand and peak flow requirements through the planning horizon year 2025 and can be expanded as needed to serve future development (City of El Centro 2016). The system is considered to have adequate capacity to accommodate anticipated near-term development, and the City continues to make periodic improvements to modernize the facilities and materials over time. Future water demand with buildout of the City and the City's sphere of influence lands will reach an average daily demand of 28 mgd and a maximum daily demand of 44.8 mgd. As stated above, the City's system can be expanded in 21 mgd increments to provide the maximum daily demand of 42 mgd and ultimately 63 mgd; such expansions would be considered when the maximum daily demand approaches 21 mgd (City of El Centro 2016).

The project consists of 180 residential units, which are estimated to house a population of approximately 673 residents, with 3.74 persons per household assumed (US Census Bureau 2019). Daily per capita water demand for the City of El Centro is estimated at 194 gallons per day (IID 2021). Therefore, the project would generate additional demand for an estimated 130,562 gpd over existing conditions. Based on the service capacity of the City's existing and planned water systems, it is anticipated that existing and future water supplies would be adequate to serve the proposed development.

As stated above, the City purchases its untreated water from the IID. The City's Water System Master Plan indicates that the Colorado River Water Delivery Agreement of October 2003 allows the IID to receive 3.1 million acre-feet of water per year (City of El Centro 2008). Therefore, the existing and future water supply is considered adequate to accommodate the increased population and associated water demand anticipated with the proposed project. Impacts would be less than significant.

c) *Would the project result in 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?* ***Less than Significant Impact.***

Refer to Response 19(a), above. The project would result in construction of 180 multi-family units which would not substantially increase demands on the City's water treatment facilities. It is anticipated that the City's water treatment plant is adequate to accommodate future planned growth through the year 2026. Additional improvements are anticipated by the City to expand the WWTP as needed to ensure that adequate capacity is maintained.

Therefore, the project would not result in 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. Impacts would be less than significant.

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?* ***Less than Significant Impact.***

AB 939 established the California Integrated Waste Management Act of 1989 (PRC Sections 42900–42927) which required all California cities and counties to reduce the volume of solid waste deposited in landfills by 50 percent by the year 2000. It also requires that cities and counties continue to remain at 50 percent or higher for each subsequent year. The act is intended to reduce, recycle, and reuse solid waste generated to the maximum extent feasible.

The act requires each California city and county to prepare, adopt, and submit to the California Department of Resources Recycling and Recovery (CalRecycle) a source reduction and recycling element (SRRE) that demonstrates how the jurisdiction will meet the act's mandated diversion goals. Each jurisdiction's SRRE must include specific components as defined in PRC Sections 41003 and 41303. In addition, the SRRE must include a program for management of solid waste generated in the jurisdiction consistent with the following hierarchy: (1) source reduction; (2) recycling and composting; and (3) environmentally safe transformation and land disposal. The SRRE is required to emphasize and maximize the use of all feasible source reduction, recycling, and composting options in order to reduce the amount of solid waste to be disposed of by transformation and land disposal (PRC Sections 40051, 41002, and 41302).

The City of El Centro Municipal Code identifies certain regulations to ensure compliance with the state's waste reduction targets (i.e., AB 939). Chapter 12, Articles I and II, require the collection, transportation, and disposal of solid waste and green waste. The project would be required to comply with such City regulations to reduce the amount of waste generated on-site.

Solid waste collection services for the City of El Centro are provided by CR&R Waste Services. Solid waste is collected and disposed of at the South Yuma County Landfill in Arizona. Solid waste from project construction activities would be delivered to the South Yuma County Landfill, which has capacity to accommodate solid waste from the project. During project operations, the project would enable the collection and sorting of solid waste materials for diversion in order to ensure compliance with statewide mandates and reduce waste delivered to the affected landfill.

Therefore, the 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. Impacts would be less than significant.

e) *Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?* ***Less than Significant Impact.***

The project would be served by an existing waste handling service, provided by CR&R Waste Services. CR&R operates consistent with federal, state, and local statutes and regulations and the landfill serving the project would also conform to all applicable statutes and regulations. Therefore, the project would result in a less than significant impact.

20. Wildfire

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
20. WILDFIRE. 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?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

*a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan? **Less than Significant Impact**.*

Refer to Response 9(f), under Hazards and Hazardous Materials, above. The City of El Centro participates in implementation of the Imperial County Multi-Jurisdictional Mitigation Plan (MJMP), which is intended to provide guidance for responding to emergency situations through a coordinated system of emergency service providers and facilities. The MJMP addresses planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies. The plan focuses on potential large-scale disasters that represent unique situations requiring unusual emergency responses. Such threats addressed by the plan include major earthquakes, hazardous materials incidents, flooding, transportation, civil unrest, and threats to national security.

During construction, materials would be placed within the project boundaries adjacent to the current phase of construction to avoid any access conflicts in case of emergency evacuations. Direct access to the project site would be from N. 8th Street and from N. 10th Street. Any improvements needed to provide adequate access to the site would be subject to City review for the potential to interfere with emergency evacuation routes to ensure that access and circulation are maintained during the construction phase. The project does not propose any components that would be anticipated to obstruct or conflict with emergency response or evacuation during project operations. Additionally, the project would be subject to site plan review by City emergency services personnel to ensure that it would not result in components that potentially interfere with an emergency response plan or an emergency evacuation plan.

No revisions to emergency response operations or evacuation plans would be required as a result of the project. The provision of emergency services to the site and surrounding properties would not be impacted as primary access to all major roads would be maintained with project implementation. Therefore, the project would not impair or physically interfere with an adopted emergency response or evacuation plan. Impacts would be less than significant.

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?* ***Less than Significant Impact.***

The project site is not located within an area designated as having a high risk for wildfire potential. The site is not identified as being located in a Very High Fire Hazard Severity Zone (VHFHSZ); however, the site is identified as a Local Responsibility Area (LRA). Similarly, all surrounding lands within the vicinity of the site are designated as having a very low risk for wildfire hazard (CalFire 2020). The project site is relatively flat and is generally void of vegetation. Limited landscaping for visual enhancement purposes is proposed with the project; however, such plantings would not substantially change or increase the potential risk for wildfire.

The project would not exacerbate wildfire risks or expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Impacts would be less than significant.

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?* ***No Impact.***

Refer to Response 20(a), above. The installation or maintenance of associated infrastructure (such as roads, fuel breaks, power lines or other utilities) that may exacerbate fire risk would not occur with the project as proposed. Additionally, the Fire Department, as part of the City's discretionary review process, would review all project plans to ensure that adequate fire suppression, fire access, and emergency evacuation are maintained. Adherence to standard City policies relative to fire risk and prevention would ensure that no impact occurs. No impact would occur.

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***.

Refer to Response 20(a), above. The site is not located in or near lands classified as being in a VHFHSZ and is designated as having a low fire hazard risk relative to LRAs. Additionally, the project site is relatively flat, and no slopes that may be subject to slope instability, flooding, or landslides after a fire event are present, nor are such conditions present on adjoining lands. Development of the site as designed would not result in a change in runoff quantities or rates from the site.

Additionally, the City has adopted the most recent Uniform Building Code, Uniform Mechanical Code, Uniform Fire Code, and the National Electric Code. These codes identify structural requirements for existing and new buildings and are designed to ensure structural integrity during seismic and other hazardous events, and to prevent injury, loss of life, and substantial property damage. To protect public safety, all planned development in El Centro is subject to these structural codes.

As designed, and with conformance to adopted regulations intended to maintain public safety, the project would not expose people to flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes. No impact would occur.

21. Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
21. MANDATORY FINDINGS OF SIGNIFICANCE.				
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 rare or endangered plants or animals, 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 that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

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 rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?* ***Less than Significant Impact with Mitigation Incorporated.***

The analysis provided herein determined that the project has the potential to directly or indirectly impact sensitive species, namely burrowing owl and/or nesting birds. Mitigation requiring preconstruction biological surveys and construction worker education would be implemented to ensure potential impacts are reduced to less than significant. Refer to mitigation measures **BIO-1** and **BIO-2** in Section 4, Biological Resources. Additionally, mitigation measure **CUL-1** would be implemented to ensure that project impacts to unknown cultural and/or tribal cultural resources, including human remains, are reduced to less than significant; refer to Section 5, Cultural Resources, and Section 18, Tribal Cultural Resources.

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 Impact.***

A cumulative impact could occur if the project would result in an incrementally considerable contribution to a significant cumulative impact in consideration of past, present, and reasonably foreseeable future projects for each resource area. No direct significant impacts were identified for the proposed project that could not be mitigated to a less than significant level. However, when combined with other projects within the vicinity, the project may result in a contribution to a potentially significant cumulative impact.

The proposed project does not include any agricultural resources that could be impacted, and the project would have no effect on population and housing or recreation. In addition, impacts would be less than significant for aesthetics, air quality, energy, geology and soils, GHG emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, minerals, noise, public services, transportation, utilities and service systems, and wildfire. As a result, cumulative impacts related to these resources would not occur.

Biological resources, cultural resources, and tribal cultural resources impacts that are generated by construction activities would be short term and limited by a temporary construction period. Mitigation measures are proposed to reduce project impacts to less than significant. As a result of the evaluation provided herein, there is no substantial evidence that, after mitigation, there are cumulative effects associated with the proposed project. Impacts would be less than significant.

c) *Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?* ***No Impact.***

In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to certain questions in the following sections: Aesthetics; Air Quality; Geology and Soils; Hazards and Hazardous Materials; Hydrology and Water Quality; Noise; Population and Housing; and Transportation and Traffic. As a result of this evaluation, no potentially significant effects to human beings were identified. No impact would occur.

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Appendix A
Air Quality/Greenhouse Gas Emissions/
Energy Consumption Assessment

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Air Quality, Greenhouse Gas Emissions and Energy Consumption Assessment

City of El Centro Town Center Village Phase IV Project

El Centro, California

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March 2021

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ENVIRONMENTAL CONSULTANTS

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Attachment B- Project Construction and Operational Fuel Consumption

LIST OF ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit
µg/m3	Micrograms per cubic meter; ppm = parts per million
AB	Assembly Bill

LIST OF ACRONYMS AND ABBREVIATIONS

APCD	Air Pollution Control District
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
County	Imperial County
DPM	Diesel particulate matter
EO	Executive Order
GHG	Greenhouse gas
GWP	Global warming potential
ICAPCD	Imperial County Air Pollution Control District
Interstate 8	I-8
IPCC	Intergovernmental Panel on Climate Change
LOS	Level of service
LSTs	Localized significance threshold
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen dioxide
NO_x	Nitric oxides
O_3	Ozone
PM	Particulate matter
PM_{10}	Coarse particulate matter
$PM_{2.5}$	Fine particulate matter
ppb	Parts per billion
Project	El Centro Town Center Village Phase IV Project
ROGs	Reactive organic gases
SB	Senate Bill
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_x	Sulfur oxides
SR	State Route
SRA	Source receptor area
SSAB	Salton Sea Air Basin
TACs	Toxic air contaminants
USEPA	U.S. Environmental Protection Agency

LIST OF ACRONYMS AND ABBREVIATIONS

VOCs	Volatile organic compounds
VMT	Vehicle Miles Traveled

1.0 INTRODUCTION

This report documents the results of an Air Quality, Greenhouse Gas (GHG) Emissions, and Energy Consumption Assessment completed for the City of El Centro Town Center Village Phase IV Project (project), which includes the development of a 180-unit apartment complex in the City of El Centro, California. The purpose of this assessment is to estimate project-generated criteria air pollutants and GHG emissions as well as the increase in energy consumption attributable to the project and to determine the level of impact the project would have on the environment. This assessment was prepared using methodologies and assumptions recommended in the rules and regulations promulgated by the Imperial County Air Pollution Control District (ICAPCD). Regional and local existing conditions are presented, along with pertinent emissions standards and regulations.

1.1 Project Location

The project site is located in the northernmost portion of the City of El Centro in south-central Imperial County, California. The property site is located between Cruickshank Drive to the north and Bradshaw Avenue to the south, and between N. 8th Street to the east and N. 10th Street to the west. The affected County Assessor Parcel Numbers (APNs) include APN 044-620-049 and a portion of APN 044-620-051. Regional access to the project vicinity is provided via Interstate 8 (I-8) which is located approximately 2.6 miles to the south; refer to Figure 1, *Project Location and Vicinity*. The site is located within the boundaries of the Town Center Village Project and represents Phase IV of 4 planned phases of development.

1.2 Project Overview

The proposed project would result in the rezoning of two parcels located in the City of El Centro's Town Center Village from CG-General Commercial to R3-Multiple Family Residential. The project applicant is requesting the rezone to allow for future development of a 180-unit apartment complex. A General Plan Amendment is also required to change the existing General Plan land use designation from General Commercial to High Density Residential. The City of El Centro (City) will act as the lead agency for the project relative to California Environmental Quality Act (CEQA) requirements.

1.3 Applicable Land Use Regulations

As previously described, the project as proposed would require a General Plan Amendment to change the existing General Plan land use designation from General Commercial to High Density Residential. The project would also rezone the property from CG-General Commercial to R3-Multiple Family Residential.

Additionally, the Imperial County Airport Land Use Compatibility Plan (County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone. The Imperial County Airport Land Use Commission previously reviewed the request to rezone the subject property as proposed and found that the rezone would be inconsistent with the Imperial County Airport Land Use Compatibility Plan. However, the City retains the authority to make a final consistency determination that may ultimately preside over the Airport Land Use Commission's decision as to the appropriateness of the requested rezone.

1.4 Project Characteristics

Table 1-1, Project Summary, identifies the various components of the project. Rezoning of the property would allow for development of a 180-unit apartment complex at a density of 15.6 dwelling units per acre (du/ac).

Table 1-1. Project Summary

Apartment Summary

Unit Plan	Square Feet	Bed/Bath	# Units	Total Square Feet
Unit 1	643	1/1	60	38,580
Unit 2A	970	2/2	60	58,200
Unit 2B (2-Story)	924	2/2.5	60	55,440
Total	**--**	**--**	**180**	**152,220**

Parking Summary

Required		Provided	
1 Bedroom; 1.5 space/unit	90	Private Garages	60
2 Bedroom; 2 spaces/unit	240	Standard Parking Stalls (9'x20')	280
Guest: 0.25 spaces/unit	45	Compact Stalls (8.5'x17')	45
Total	**375**	**--**	**385**

Open Space Summary

Required		Provided	
150 SF per unit common open space (20' minimum width)	27,000	Recreation Amenity (Minus Clubhouse)	16,710
		Common Open Space & Dog Park	31,430
Total	**27,000**	**--**	**48,140**

Site Coverage

Required		Provided		
Standard	**Square Feet**	**Coverage**	**Square Feet**	**Percent**
Maximum Lot Coverage = 60%	302,000 – 304,000	Building Coverage	126,900	25%
		Roads and Parking	169,980	34%
Total			**296,880**	**59%**

1.5 Project Construction

Schedule

It is estimated that project construction would occur over a period of approximately 19 months, from initial site preparation through final construction and finishing (i.e., painting). It is anticipated that the work would be completed in 8- or 10-hour shifts, with a total of five shifts per week (Monday-Friday). Overtime and weekend work may occur as necessary to meet scheduled milestones or accelerate the schedule and would comply with all applicable California labor laws as well as local City regulations regulating construction activities.

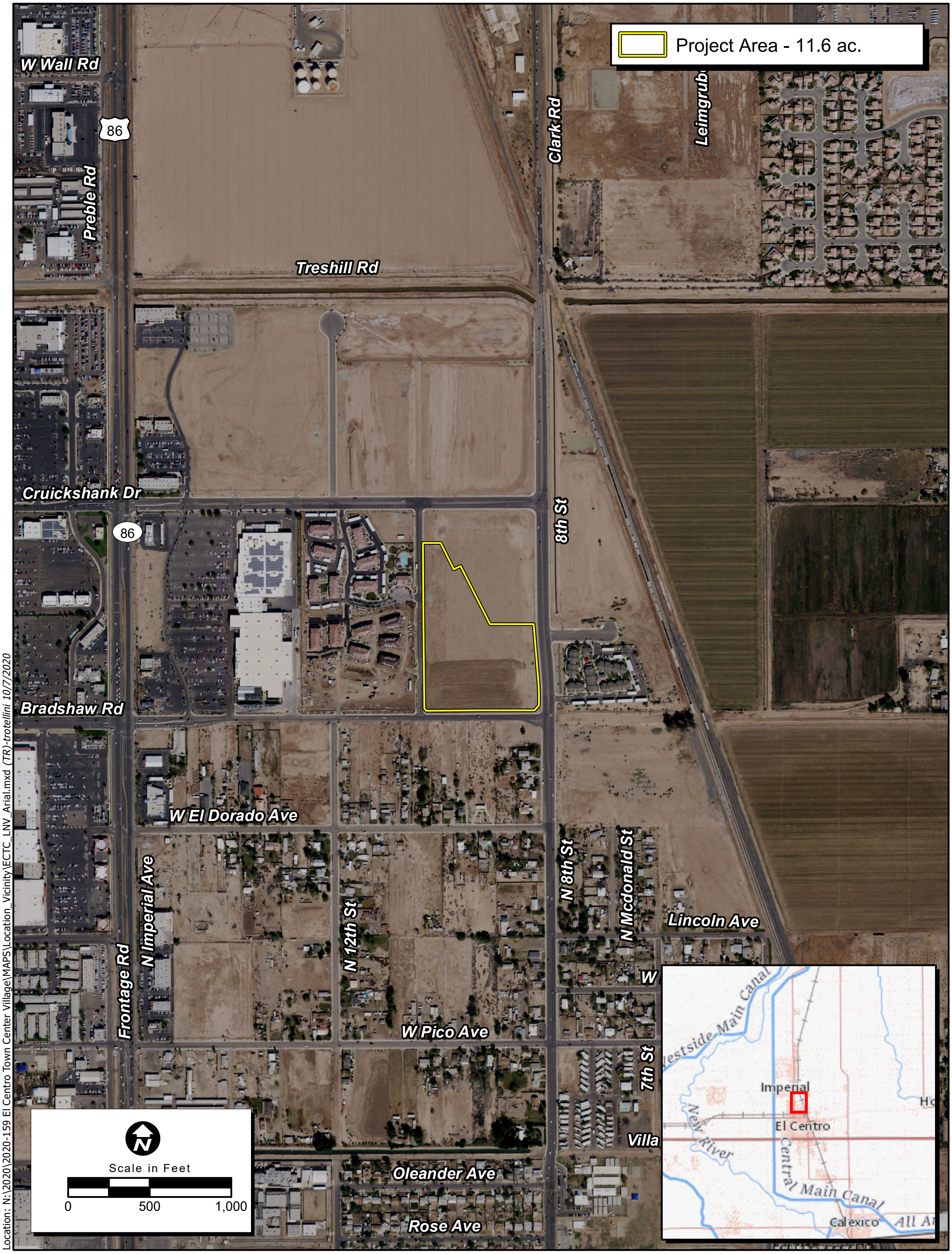

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Photo Source: NAIP (2018), Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Map Date: 10/7/2020

Figure 1. Project Location and Vicinity

2020-159 El Centro Town Center Village

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2.0 AIR QUALITY

2.1 Air Quality Setting

Air quality in a region is determined by its topography, meteorology, and existing air pollutant sources. These factors are discussed below, along with the current regulatory structure that applies to the Salton Sea Air Basin (SSAB), which encompasses the project site, pursuant to the regulatory authority of the ICAPCD.

Ambient air quality is commonly characterized by climate conditions, the meteorological influences on air quality, and the quantity and type of pollutants released. The air basin is subject to a combination of topographical and climatic factors that reduce the potential for high levels of regional and local air pollutants. The following section describes the pertinent characteristics of the air basin and provides an overview of the physical conditions affecting pollutant dispersion in the project area.

2.1.1 Salton Sea Air Basin

The California Air Resources Board (CARB) divides California (State) into air basins that share similar meteorological and topographical features. Imperial County, which extends over 4,482 square miles in the southeastern corner of California, lies in the SSAB, which includes the Imperial Valley and the central part of Riverside County, including the Coachella Valley. The province is characterized by the large-scale sinking and warming of air within the semi-permanent subtropical high-pressure center over the Pacific Ocean. The elevation in Imperial County ranges from about 230 feet below sea level in the Salton Sea to more than 2,800 feet on the mountain summits to the east.

Temperature and Precipitation

The flat terrain near the Salton Sea, intense heat from the sun during the day, and strong radiational cooling at night create deep convective thermals during the daytime and equally strong surface-based temperature inversions at night. The temperature inversions and light nighttime winds trap any local air pollution emissions near the ground. The area is subject to frequent hazy conditions at sunrise, followed by rapid daytime dissipation as winds pick up and the temperature warms. The lack of clouds and atmospheric moisture creates strong diurnal and seasonal temperature variations ranging from an average summer maximum of 108 degrees Fahrenheit (° F) down to a winter morning minimum of 38° F. The most pleasant weather occurs from about mid-October to early May when daily highs are in the 70s and 80s with very infrequent cloudiness or rainfall. Imperial County experiences rainfall on an average of only four times per year (>0.10 inches in 24 hours). The local area usually has three days of rain in winter and one thunderstorm day in August. The annual rainfall in this region is less than three inches per year (ICAPCD 2010).

Wind

Winds in the area are driven by a complex pattern of local, regional and global forces, but primarily reflect the temperature difference between the cool ocean to the west and the heated interior of the entire desert southwest. For much of the year, winds flow predominantly from the west to the east. In summer, intense solar heating in the Imperial Valley creates a more localized wind pattern, as air comes up from the southeast via the Gulf of California. During periods of strong solar heating and intense convection, turbulent motion creates good mixing and low levels of air pollution. However, even strong turbulent mixing is insufficient to overcome the limited air pollution controls on sources in the Mexicali, Mexico area. Imperial County is predominately agricultural land. This is a factor in the cumulative air quality of the SSAB. The agricultural production generates dust and small particulate matter through the use of agricultural equipment on unpaved roads, land preparation, and harvest practices. The Imperial County experiences unhealthful air quality from photochemical smog and from dust due to extensive surface disturbance and the very arid climate (ICAPCD 2010).

Inversions

The entire county is affected by inversion layers, where warm air overlays cooler air. Inversion layers trap pollutants close to the ground. In the winter, these pollutant-trapping, ground-based inversions are formed during windless, clear-sky conditions, as cold air collects in low-lying areas such as valleys and canyons. Imperial County experiences surface inversions almost every day of the year. Due to strong surface heating, these inversions are usually broken allowing pollutants to be more easily dispersed (ICAPCD 2010).

2.1.2 Criteria Air Pollutants

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health with a determined margin of safety. Ozone (O_3), coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered a local pollutant. Health effects commonly associated with criteria pollutants are summarized in Table 2-1.

Table 2-1. Criteria Air Pollutants- Summary of Common Sources and Effects

Pollutant	Major Manmade Sources	Human Health & Welfare Effects
CO	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
NO_2	A reddish-brown gas formed during fuel combustion for motor vehicles, energy utilities and industrial sources.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Causes brown discoloration of the atmosphere.
O_3	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrous oxides (N_2O) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, solvents, paints and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield.
PM_{10} & $PM_{2.5}$	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
SO_2	A colorless, nonflammable gas formed when fuel containing sulfur is burned. Examples are refineries, cement manufacturing, and locomotives.	Respiratory irritant. Aggravates lung and heart problems. Can damage crops and natural vegetation. Impairs visibility.

Source: California Air Pollution Control Officers Association (CAPCOA 2013)

Carbon Monoxide

CO in the urban environment is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can cause headaches, aggravate cardiovascular disease and impair central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations of CO are typically found near crowded intersections and along heavy roadways with slow moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within relatively short distances of the source. Overall CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO levels in the SSAB are in compliance with the state and federal one- and eight-hour standards.

Nitrogen Oxides

Nitrogen gas comprises about 80 percent of the air and is naturally occurring. At high temperatures and under certain conditions, nitrogen can combine with oxygen to form several different gaseous compounds collectively called nitric oxides (NO_x). Motor vehicle emissions are the main source of NO_x in urban areas. NO_x is very toxic to animals and humans because of its ability to form nitric acid with water in the eyes, lungs, mucus membrane, and skin. In animals, long-term exposure to NO_x increases susceptibility to respiratory infections, and lowering resistance to such diseases as pneumonia and influenza. Laboratory studies show that susceptible humans, such as asthmatics, who are exposed to high concentrations can suffer from lung irritation or possible lung damage. Precursors of NO_x, such as NO and NO_2, attribute to the formation of O_3 and $PM_{2.5}$. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

Ozone

O_3 is a secondary pollutant, meaning it is not directly emitted. It is formed when volatile organic compounds (VOCs) or ROGs and NO_x undergo photochemical reactions that occur only in the presence of sunlight. The primary source of ROG emissions is unburned hydrocarbons in motor vehicle and other internal combustion engine exhaust. NO_x forms as a result of the combustion process, most notably due to the operation of motor vehicles. Sunlight and hot weather cause ground-level O_3 to form. Ground-level O_3 is the primary constituent of smog. Because O_3 formation occurs over extended periods of time, both O_3 and its precursors are transported by wind and high O_3 concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when O_3 levels exceed ambient air quality standards. Numerous scientific studies have linked ground-level O_3 exposure to a variety of problems including lung irritation, difficult breathing, permanent lung damage to those with repeated exposure, and respiratory illnesses.

Particulate Matter

PM includes both aerosols and solid particulates of a wide range of sizes and composition. Of concern are those particles smaller than or equal to 10 microns in diameter size (PM_{10}) and small than or equal to 2.5 microns in diameter ($PM_{2.5}$). Smaller particulates are of greater concern because they can penetrate deeper into the lungs than larger particles. PM_{10} is generally emitted directly as a result of mechanical processes that crush or grind larger particles or form the resuspension of dust, typically through construction activities and vehicular travel. PM_{10} generally settles out of the atmosphere rapidly and is not readily transported over large distances. $PM_{2.5}$ is directly emitted in combustion exhaust and is formed in atmospheric reactions between various gaseous pollutants, including NO_x, sulfur oxides (SO_x) and VOCs. $PM_{2.5}$ can remain suspended in the atmosphere for days and/or weeks and can be transported long distances.

The principal health effects of airborne PM are on the respiratory system. Short-term exposure of high $PM_{2.5}$ and PM_{10} levels are associated with premature mortality and increased hospital admissions and emergency room visits. Long-term exposure is associated with premature mortality and chronic respiratory disease. According to the U.S. Environmental Protection Agency (USEPA), some people are much more sensitive than others to breathing PM_{10} and $PM_{2.5}$. People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worse illnesses; people with bronchitis can expect aggravated symptoms; and children may experience decline in lung function due to breathing in PM_{10} and $PM_{2.5}$. Other groups considered sensitive include smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths.

2.1.3 Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Additionally, diesel engines emit a complex mixture of air pollutants composed of gaseous and solid material. The solid emissions in diesel exhaust are known as diesel particulate matter (DPM). In 1998, California identified DPM as a TAC based on its potential to cause cancer, premature death, and other health problems (e.g., asthma attacks and other respiratory symptoms). Those most vulnerable are children (whose lungs are still developing) and the elderly (who may have other serious health problems). Overall, diesel engine emissions are responsible for the majority of California's known cancer risk from outdoor air pollutants. Diesel engines also contribute to California's $PM_{2.5}$ air quality problems. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

Diesel Exhaust

Most recently, CARB identified DPM as a TAC. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine (USEPA 2002). Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs; due to their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

Asbestos

The term "asbestos" describes naturally occurring fibrous minerals found in certain types of rock formations. It is a mineral compound of silicon, oxygen, hydrogen, and various metal cations. When mined and processed, asbestos is typically separated into very thin fibers. When these fibers are present in the air, they are normally invisible to the naked eye. Once airborne, asbestos fibers can cause serious health problems. If inhaled, asbestos fibers can impair normal lung functions, and increase the risk of developing lung cancer, mesothelioma, or asbestosis.

Naturally-occurring asbestos, which was identified as a TAC in 1986 by ARB, is located in many parts of California and is commonly associated with ultramafic rock. The project site is not located in an area of known or suspected naturally-occurring asbestos (DOC 2000).

Valley Fever

Valley fever is an infection caused by the fungus *Coccidioides*. The scientific name for valley fever is "coccidioidomycosis," and it's also sometimes called "desert rheumatism." The term "valley fever" usually refers to *Coccidioides* infection in the lungs, but the infection can spread to other parts of the body in severe cases.

Coccidioides spores circulate in the air after contaminated soil and dust are disturbed by humans, animals, or the weather. The spores are too small to see without a microscope. When people breathe in the spores, they are at risk for developing valley fever. After the spores enter the lungs, the person's body temperature allows the spores to change shape and grow into spherules. When the spherules get large enough, they break open and releases smaller pieces (called endospores) which can then potentially spread within the lungs or to other organs and grow into new spherules. In extremely rare cases, the fungal spores can enter the skin through a cut, wound, or splinter and cause a skin infection.

Symptoms of valley fever may appear between 1 and 3 weeks after exposure. Symptoms commonly include fatigue, coughing, fever, shortness of breath, headaches, night sweats, muscle aches and joint pain, and rashes on upper body or legs.

Approximately 5 to 10 percent of people who get valley fever will develop serious or long-term problems in their lungs. In an even smaller percent of people (about 1 percent), the infection spreads from the lungs to other parts of the body, such as the central nervous system (brain and spinal cord), skin, or bones and joints. Certain groups of people may be at higher risk for developing the severe forms of valley fever, such as people who have weakened immune systems. The fungus that causes valley fever, *Coccidioides*, can't spread from the lungs between people or between people and animals. However, in extremely rare instances, a wound infection with *Coccidioides* can spread valley fever to someone else, or the infection can be spread through an organ transplant with an infected organ.

For many people, the symptoms of valley fever will go away within a few months without any treatment. Healthcare providers choose to prescribe antifungal medication for some people to try to reduce the severity of symptoms or prevent the infection from getting worse. Antifungal medication is typically given to people who are at higher risk for developing severe valley fever. The treatment typically occurs over a period of roughly 3 to 6 months. In some instances, longer treatment may be required. If Valley fever develops into meningitis life-long antifungal treatment is typically necessary.

Between the years 1998 to 2012, nearly 130,000 valley fever cases were reported to the Centers for Disease Control (CDC). In states where valley fever is endemic and reportable (Arizona, California, Nevada, New Mexico, and Utah), overall incidence in 2011 was 42.6 cases per 100,000 population and was highest among persons aged 60-79 years.

Scientists continue to study how weather and climate patterns affect the habitat of the fungus that causes valley fever. *Coccidioides* is thought to grow best in soil after heavy rainfall and then disperse into the air most effectively during hot, dry conditions. For example, hot and dry weather conditions have been shown to correlate with an increase in the number of valley fever cases in Arizona and in California. The ways in which climate change may be affecting the number of Valley fever infections, as well as the geographic range of *Coccidioides*, isn't known yet, but is a subject for further research.

2.1.4 Ambient Air Quality

Ambient air quality at the project site can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. CARB maintains more than 60 monitoring stations throughout California. O_3, PM_{10} and $PM_{2.5}$ are the pollutant species most potently affecting the project region. As described in detail below, the region is designated as a nonattainment area for the federal O_3, PM_{10} and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019). The El Centro air quality monitoring station, located at 150 9th Street approximately 1.38 miles south of the project site, monitors ambient concentrations of O_3, $PM_{2.5}$ and PM_{10}. Ambient emission concentrations will vary due to localized variations in emission sources and climate and should be considered "generally" representative of ambient concentrations in the project area.

Table 2-2 summarizes the published data concerning O_3, $PM_{2.5}$ and PM_{10} since 2017 for each year that the monitoring data is provided.

Table 2-2. Summary of Ambient Air Quality Data

Pollutant Standards	2017	2018	2019
O_3			
Max 1-hour concentration (ppm)	0.110	0.102	0.080
Max 8-hour concentration (ppm) (federal/state)	0.092 / 0.092	0.090 / 0.090	0.071 / 0.071
Number of days above 1-hour standard (federal/state)	0 / 4	0 / 2	0 / 0
Number of days above 8-hour standard (federal/state)	17 / 17	14 / 15	1 / 1
$PM_{2.5}$			
Max 24-hour concentration (µg/m3) (federal/state)	23.2 / 23.2	22.4 / 22.4	21.4 / 21.4
Number of days above federal 24-hour standard	0.0	0.0	0.0
PM_{10}			
Max 24-hour concentration (µg/m3) (federal/state)	268.5 / 186.4	256.3 / 253.0	123.9 / 130.0
Number of days above 24-hour standard (federal/state)	5.0 / *	5.1 / 113.0	0.0 / 53.7

Source: CARB 2020a
µg/m^3 = micrograms per cubic meter; ppm = parts per million
* = Insufficient data available

The USEPA and CARB designate air basins or portions of air basins and counties as being in "attainment" or "nonattainment" for each of the criteria pollutants. Areas that do not meet the standards are classified as nonattainment areas. The National Ambient Air Quality Standards (NAAQS) (other than O_3, PM_{10} and $PM_{2.5}$ and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Ambient Air Quality Standards (CAAQS) are not to be exceeded during a three-year period. The attainment status for the SSAB, which encompasses the project site, is included in Table 2-3.

Table 2-3. Attainment Status of Criteria Pollutants in the Salton Sea Air Basin

Pollutant	State Designation	Federal Designation
O_3	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Attainment	Nonattainment
CO	Attainment	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Unclassified/Attainment

Source: CARB 2019

The determination of whether an area meets the state and federal standards is based on air quality monitoring data. Some areas are unclassified, which means there is insufficient monitoring data for determining attainment or nonattainment. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant-specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant. The region is designated as a nonattainment area for the federal O_3 PM_{10}, and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10} (CARB 2019).

2.1.5 Sensitive Receptors

Sensitive receptors are defined as facilities or land uses that include members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. The nearest existing sensitive receptors to the project site are multi-family residences located to the east (across 8th Street) and west (across 10th Street) of the project site.

2.2 Regulatory Framework

2.2.1 Federal

Clean Air Act

The Federal Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the United States Environmental Protection Agency (USEPA) to establish the NAAQS, with states retaining the option to adopt more stringent standards or to include other specific pollutants. On April 2, 2007, the Supreme Court found that carbon dioxide (CO_2) is an air pollutant covered by the CAA; however, no NAAQS have been established for CO_2.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The USEPA has classified air basins (or portions thereof) as being in attainment, nonattainment, or unclassified for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. Table 2-3 lists the federal attainment status of the SSAB for the criteria pollutants.

2.2.2 State

California Clean Air Act

The California Clean Air Act (CCAA) allows the state to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. CARB, a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the CAAQS. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

California State Implementation Plan

The CCAA (and its subsequent amendments) requires the state to prepare an air quality control plan referred to as the SIP. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The USEPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register.

Local air districts, such as the ICAPCD, prepare air quality attainment plans or air quality management plans and submit them to CARB for review, approval, and incorporation into the applicable SIP. The air districts develop the strategies stated in the SIPs for achieving air quality standards on a regional basis.

For 8-Hour O_3, the ICAPCD adopted the 2017 8-hour Ozone State Implementation Plan in October 2018. The plan includes control measures which are an integral part of how the ICAPCD currently controls the ROG and NO_X emissions within the O_3 nonattainment areas. The overall strategy includes programs and control measures which represent the implementation of Reasonable Available Control Technology (40 CFR 51.912) and the assurance that stationary sources maintain a net decrease in emissions.

For PM_{10}, the ICAPCD adopted the PM_{10} State Implementation Plan in 2018, which maintained previously adopted fugitive dust control measures (Regulation VIII). The USEPA had previously approved Regulation VIII fugitive dust rules into the Imperial County portion of the California SIP in 2013.

For $PM_{2.5}$, the ICAPCD adopted the $PM_{2.5}$ SIP in April 2018. This SIP concluded that the majority of the $PM_{2.5}$ emissions resulted from transport in nearby Mexico. Specifically, the SIP demonstrates attainment of the 2006 $PM_{2.5}$ NAAQS "but for" transport of international emissions from Mexicali, Mexico. In accordance with the CCAA, the $PM_{2.5}$ SIP satisfies the attainment demonstration requirement satisfying the provisions of the CCAA.

The ICAPCD is working cooperatively with counterparts from Mexico to implement emissions reductions strategies and projects for air quality improvements at the border. The two countries strive to achieve these goals through local input from states, County governments, and citizens. Within the Mexicali and Imperial Valley area, the Air Quality Task Force (AQTF) has been organized to address those issues unique to the border region known as the Mexicali/Imperial air shed. The AQTF membership includes representatives from Federal, State, and local governments from both sides of the border, as well as representatives from academia, environmental organizations, and the general public. This group was created to promote regional efforts to improve the air quality monitoring network, emissions inventories, and air pollution transport modeling development, as well as the creation of programs and strategies to improve air quality.

Tanner Air Toxics Act & Air Toxics "Hot Spots" Information and Assessment Act

CARB's Statewide comprehensive air toxics program was established in 1983 with Assembly Bill (AB) 1807, the Toxic Air Contaminant Identification and Control Act (Tanner Air Toxics Act of 1983). AB 1807 created California's program to reduce exposure to air toxics and sets forth a formal procedure for CARB to designate substances as TACs. Once a TAC is identified, CARB adopts an airborne toxics control measure (ATCM) for sources that emit designated TACs. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology to minimize emissions.

CARB also administers the state's mobile source emissions control program and oversees air quality programs established by state statute, such as AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the air quality management district or air pollution control district. High priority facilities are required to perform a health risk assessment (HRA) and, if specific thresholds are exceeded, required to communicate the results to the public in the form of notices and public meetings. In September 1992, the "Hot Spots" Act was amended by Senate Bill (SB) 1731, which required facilities that pose a significant health risk to the community to reduce their risk through a risk management plan.

2.2.3 Local

Imperial County Air Pollution Control District

The ICAPCD is the local air quality agency and shares responsibility with CARB for ensuring that state and federal ambient air quality standards are achieved and maintained in the SSAB. Furthermore, ICAPCD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs and regulates agricultural burning. Other ICAPCD responsibilities include monitoring ambient air quality, preparing clean air plans, planning activities such as modeling and maintenance of the emission inventory, and responding to citizen air quality complaints.

To achieve and maintain ambient air quality standards, the ICAPCD has adopted various rules and regulations for the control of airborne pollutants. The ICAPCD Rules and Regulations that are applicable to the proposed project include, but are not limited to, ICAPCD Rule 801 requirements for construction activities. The purpose of this rule is to reduce the amount of PM_{10} entrained in the ambient air as a result of emissions generated from construction and other earthmoving activities by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. In addition, the project is required to adopt best available control measures to minimize emissions from surface-disturbing activities to comply with ICAPCD Regulation VIII (Fugitive Dust Rules). These measures include the following (ICAPCD 2017):

- All disturbed areas, including bulk material storage which is not being actively utilized, shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by using water, chemical stabilizers, dust suppressants, tarps, or other suitable material such as vegetative ground cover.
- All on-site and off-site unpaved roads will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants, and/or watering.
- All unpaved traffic areas of 1 acre or more with 75 or more average vehicle trips per day will be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emissions by paving, chemical stabilizers, dust suppressants, and/or watering.

- The transport of bulk materials shall be completely covered unless 6 inches of freeboard space from the top of the container is maintained with no spillage and loss of bulk material. In addition, the cargo compartment of all haul trucks is to be cleaned and/or washed at the delivery site after removal of bulk material.
- All track-out or carry-out will be cleaned at the end of each workday or immediately when mud or dirt extends a cumulative distance of 50 linear feet or more onto a paved road within an urban area.
- Bulk material handling or transfer shall be stabilized prior to handling or at points of transfer with application of sufficient water, chemical stabilizers, or by sheltering or enclosing the operation and transfer line.
- The construction of any new unpaved road is prohibited within any area with a population of 500 or more unless the road meets the definition of a temporary unpaved road. Any temporary unpaved road shall be effectively stabilized and visible emissions shall be limited to no greater than 20 percent opacity for dust emission by paving, chemical stabilizers, dust suppressants and/or watering.

In addition, there are other ICAPCD rules and regulations, not detailed here, which may apply to the proposed project but are administrative or descriptive in nature. These include rules associated with fees, enforcement and penalty actions, and variance procedures.

2.3 Air Quality Emissions Impact Assessment

2.3.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act (CEQA) Guidelines Appendix G thresholds of significance. The project would result in a significant impact to air quality if it would do any of the following:

1) Conflict with or obstruct implementation of any applicable air quality plan.
2) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors).
3) Expose sensitive receptors to substantial pollutant concentrations.
4) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

ICAPCD Thresholds

The significance criteria established by the applicable air quality management or air pollution control district (ICAPCD) may be relied upon to make the above determinations. The ICAPCD has identified significance thresholds for use in evaluating project impacts under CEQA. Accordingly, the ICAPCD-recommended thresholds of significance are used to determine whether implementation of the proposed project would result in a significant air quality impact. Significance thresholds for evaluation construction and operational air quality impacts are listed in Table 2-4.

Table 2-4. ICAPCD Significance Thresholds – Pounds per Day

Criteria Pollutant and Precursors	Construction Activities	Operations	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	
		Tier I Threshold	Tier II Threshold
ROG	75	<137	>137
NO_x	100	<137	>137
PM_{10}	150	<150	>150
$PM_{2.5}$	N/A	<550	>550
CO	550	<550	>550
SO_2	N/A	<150	>150

Source: ICAPCD 2017

Projects that are predicted to exceed Tier I thresholds require implementation of applicable ICAPCD standard mitigation measures to be considered less than significant. Projects exceeding Tier II thresholds are required to implement applicable ICAPCD standard mitigation measures, as well as applicable discretionary mitigation measures. Projects that exceed the Tier II thresholds after implementation of standard and discretionary mitigation measures would be considered to have a potentially significant impact to human health and welfare.

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to 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 individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds would not be considered cumulative considerable.

2.3.2 Methodology

Air quality impacts were assessed in accordance with methodologies recommended by the ICAPCD. Where project-related criteria air pollutant quantification was required, the California Emissions Estimator Model (CalEEMod), version 2016.3.2 emissions modeling software is employed. CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria pollutant emissions associated with both construction and operations from a variety of land use projects. Construction generated air pollutant emissions were calculated using a combination of model defaults for Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required. Operational emissions were calculated using a combination of model defaults for Imperial County and an estimated project trip generation rate of 1,320 average daily trips provided by Michael Baker International (2020).

2.3.3 Impact Analysis

Project Construction-Generated Criteria Air Quality Emissions

Emissions associated with project implementation would be temporary and short-term but have the potential to represent a significant air quality impact. Two basic sources of short-term emissions will be generated through project implementation: operation of the heavy-duty equipment (i.e., excavators, loaders, haul trucks) and the creation of fugitive dust during clearing and grading. Construction activities such as excavation and grading operations, construction vehicle traffic, and wind blowing over exposed soils would generate exhaust emissions and fugitive PM emissions that affect local air quality at various times during construction. Effects would be variable depending on the weather, soil conditions, the amount of activity taking place, and the nature of dust control efforts. The dry climate of the area during the summer months creates a high potential for dust generation. Construction activities would be subject to ICAPCD Rule 801 which, as previously described, requires taking reasonable precautions to reduce the amount of PM_{10} entrained in the ambient air as a result of emissions generated from construction and other earthmoving activities by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. In addition, the project is required to adopt best available control measures to minimize emissions from surface-disturbing activities to comply with ICAPCD Regulation VIII (Fugitive Dust Rules).

Emissions associated with project off-road equipment, worker commute trips, and ground disturbance were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects, based on typical construction requirements. See Attachment A for more information regarding the construction assumptions, including types of construction equipment used and project duration used in this analysis.

Predicted maximum daily emissions attributable to project construction are summarized in Table 2-5. Such emissions are short-term and of temporary duration, lasting only as long as project construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated exceeds the ICAPCD thresholds of significance.

Table 2-5. Project Construction -Related Emissions

Construction Year	Pollutant					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Daily (pounds per day)						
Construction 2021	10.03	45.87	26.67	0.11	11.77	2.99
Construction 2022	9.76	17.96	25.51	0.05	7.21	2.35
ICAPCD Daily Significance Threshold	*75*	*100*	*550*	-	*150*	-
Exceed ICAPCD Daily Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod version 2016.3.2. Construction generated air pollutant emissions were calculated using a combination of model defaults for Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required (14,000 cubic yards of cut material and 23,000 cubic yards of fill material). Road silt loading has been increased to more accurately account for PM generated by worker commute and vendor traffic. Refer to Attachment A for Model Data Outputs.

As shown in Table 2-5, emissions generated during project construction would not exceed the ICAPCD's construction thresholds of significance. Therefore, criteria pollutant emissions generated during project construction 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.

Project Operations Criteria Air Quality Emissions

Implementation of the project would result in long-term operational emissions of criteria air pollutants such as PM_{10}, $PM_{2.5}$, CO, and SO_2 as well as O_3 precursors such as ROGs and NO_X. Project-generated increases in emissions would be predominantly associated with motor vehicle use. As previously described, operational air pollutant emissions were based on the project site plans and the estimated traffic trip generation rates provided by Michael Baker International (2020). Long-terms operational emissions attributable to the project are identified in Table 2-6 and compared to the operational significance thresholds promulgated by the ICAPCD.

Table 2-6. Operational-Related Emissions (Regional Significance Analysis)						
Emission Source	**Pollutant (pounds per day)**					
	ROG	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Summer Emissions						
Area	4.99	0.17	14.89	0	0.08	0.08
Energy	0.08	0.71	0.30	0	0.06	0.06
Mobile	3.73	20.54	35.21	0.09	18.20	4.60
Total:	**8.80**	**21.42**	**50.40**	**0.09**	**18.34**	**4.74**
ICAPCD Daily Significance Threshold	*137*	*137*	*550*	*150*	*150*	*550*
Exceed ICAPCD Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Winter Emissions						
Area	4.99	0.17	14.89	0	0.08	0.08
Energy	0.08	0.71	0.30	0	0.06	0.06
Mobile	2.8	20.32	29.52	0.08	18.20	4.60
Total:	**7.87**	**21.20**	**44.71**	**0.08**	**18.34**	**4.74**
ICAPCD Daily Significance Threshold	*137*	*137*	*550*	*150*	*150*	*550*
Exceed ICAPCD Regional Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: CalEEMod version 2016.3.2. Operational emissions were calculated using a combination of model defaults for Imperial County and an estimated a project trip generation rate of 1,320 average daily trips. Road silt loading has been increased to more accurately account for PM generated by operational traffic. Refer to Attachment A for Model Data Outputs.

As shown in Table 2-6, the project's emissions would not exceed any ICAPCD thresholds for any criteria air pollutants during operation.

Project Consistency with ICAPCD Air Quality Planning

As part of its enforcement responsibilities, the USEPA requires each state with nonattainment areas to prepare and submit a SIP that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. The SIP is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. CARB is the lead agency for developing the SIP in California. Local air districts, such as the ICAPCD, prepare air quality attainment plans or air quality management plans and submit them to CARB for review, approval, and incorporation into the applicable SIP. The air districts develop the strategies stated in the SIPs for achieving air quality standards on a regional basis. As identified in Table 2-3, the project region of the SSAB is classified nonattainment for federal O_3, $PM_{2.5}$ and PM_{10} standards (CARB 2019).

The region's SIP is constituted of the ICAPCD air quality plans: 2018 PM_{10} SIP, the 2018 Annual $PM_{2.5}$ SIP, the 2017 8-Hour Ozone SIP, 2013 24-Hour $PM_{2.5}$ SIP, the 2009 1997 8-hour Ozone RACT SIP, and the 2009 PM10 SIP and the 2008 Ozone Early Progress Plans. These air quality attainment plans are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations, and federal controls describing how the state will attain ambient air quality standards. These SIP plans and associated control measures are based on information derived from projected growth in Imperial County in order to project future emissions and then determine strategies and regulatory controls for the reduction of emissions. Growth projections are based on the general plans developed by Imperial County and the incorporated cities in the county, including El Centro.

As such, projects that comply with all applicable district rules and regulations, comply with all proposed control measures from the applicable plan(s), and propose development consistent with the growth anticipated by the respective general plan of the jurisdiction in which the proposed development is located (e.g., El Centro), would be consistent with the SIP. A project is nonconforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan by failing to adhere to air district rules or control measures, exceeding air district thresholds of significance, or proposing a development substantially denser than that assumed in the general plan.

As demonstrated above, the project would generate criteria air pollutants at levels below all applicable ICAPCD thresholds of significance and would be required to adhere to ICAPCD control measures such as Rule 801 and ICAPCD Regulation VIII. However, as previously described a General Plan Amendment is proposed to change the existing General Plan land use designation from General Commercial to High Density Residential. Thus, the project as proposed is not consistent with the El Centro General Plan and is therefore potentially inconsistent with the types, intensity, and patterns of land use assumed for the site vicinity in ICAPCD's air quality planning efforts.

As previously described, the ICAPCD air quality plans are intended to reduce emissions of criteria pollutants for which the region is in nonattainment by establishing a program of rules and regulations directed at reducing air pollutant emissions and achieving state and national air quality standards. The project proposal to amend the General Plan land use designation from General Commercial to High Density Residential is consistent with this strategy. First, the project is considered 'infill development' as it proposes to develop a property in a rapidly urbanizing area with residential uses in close proximity to a wide range of commercial businesses and services (along N. Imperial Avenue). As a result of proposing residential land uses in proximity to N. Imperial Avenue and its large amount of commercial services, the project can be identified for its "location efficiency". Location efficiency describes the location of the project relative to the type of urban landscape its proposed to fit within. In general, compared to the statewide average, a project with location efficiency can realize automotive vehicle mile trip (VMT) reductions between 10 and 65 percent (CAPCOA 2017), which in turn results in reduced air pollutant emissions. The project would locate residences in close proximity to existing offsite commercial uses, thereby providing commercial and work options to the future residents that would live at the project site. The location efficiency of the project site would result in synergistic benefits that would reduce vehicle trips and VMT compared to the statewide average and would result in corresponding reductions in transportation-related emissions, a primary goal of the ICAPCD air quality planning efforts. Due to the wide range of commercial services located along N. Imperial Avenue, the proposed General Plan Amendment and zone change would thereby enhance the physical design of the urban environment by instigating land use diversity and positioning more residents within close proximity to existing commercial land uses. The increases in land use diversity and mix of uses in the project area would reduce vehicle trips and VMT by encouraging walking and non-automotive forms of transportation, which would result in corresponding reductions in transportation-related emissions, a primary goal of the ICAPCD.

For these reasons, the project proposal to amend the General Plan land use designation of the project site from General Commercial to High Density Residential would be consistent with ICAPCD strategies for integrating land use and transportation in a manner that reduces regional air pollutants, and thus is consistent with the applicable air quality management plans.

Exposure of Sensitive Receptors to Toxic Air Contaminants

As previously described, sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over age 65, children under age 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis. As previously stated, the nearest existing sensitive receptors to the project site are multi-family residences located to the east (across 8th Street) and west (across 10th Street) of the project site.

Construction-Generated Air Contaminants

Construction-related activities would result in temporary, short-term emissions of diesel particulate matter (DPM), ROG, NOx, CO, and PM_{10} from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., clearing, grading); soil hauling truck traffic; paving; and other miscellaneous activities. The El Centro portion of the SSAB is listed as a nonattainment area for the federal O_3, PM_{10}, and $PM_{2.5}$ standards and is also a nonattainment area for the state standards for O_3 and PM_{10}. Thus, existing O_3 and $PM_{2.5}$ levels in the Project portion of the SSAB are at unhealthy levels during certain periods. However, as shown in Table 2-5 the Project would not exceed the ICAPCD significance thresholds for construction emissions.

The health effects associated with O_3 are generally associated with reduced lung function. Because the Project would not involve construction activities that would result in O_3 precursor emissions (ROG or NOx) in excess of the ICAPCD thresholds, the Project is not anticipated to substantially contribute to regional O_3 concentrations and the associated health impacts.

CO tends to be a localized impact associated with congested intersections. In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions. The Project would not involve construction activities that would result in CO emissions in excess of the ICAPCD thresholds. Thus, the Project's CO emissions would not contribute to the health effects associated with this pollutant.

Particulate matter (PM_{10} and $PM_{2.5}$) contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Particulate matter exposure has been linked to a variety of problems, including premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing. For construction activity, DPM is the primary toxic air contaminant (TAC) of concern. Based on the emission modeling conducted, the maximum onsite construction-related daily emissions of exhaust $PM_{2.5}$, considered a surrogate for DPM, would be 0.72 pounds/day during construction in the year 2021, 0.43 pounds/day during construction in 2022 (see Attachment A). $PM_{2.5}$ exhaust is considered a surrogate for DPM because more than 90 percent of DPM is less than 1 microgram in diameter and therefore is a subset of particulate matter under 2.5 microns in diameter (i.e., $PM_{2.5}$). Most $PM_{2.5}$ derives from combustion, such as use of gasoline and diesel fuels by motor vehicles. As with O_3 and NOx, the project would not generate emissions of PM_{10} or $PM_{2.5}$ that would exceed the ICAPCD's thresholds. Accordingly, the project's PM_{10} and $PM_{2.5}$ emissions are not expected to cause any increase in related regional health effects for these pollutants.

In summary, project construction would not result in a potentially significant contribution to regional concentrations of nonattainment pollutants and would not result in a significant contribution to the adverse health impacts associated with those pollutants.

Operational Air Contaminants

Operation of the proposed project would not result in the development of any substantial sources of air toxics. There are no stationary sources associated with the operations of the project; nor would the project attract additional mobile sources that spend long periods queuing and idling at the site. Onsite Project emissions would not result in significant concentrations of pollutants at nearby sensitive receptors. The maximum operation-related emissions of exhaust $PM_{2.5}$, considered a surrogate for DPM, would be 0.17 pounds in a single day. Therefore, the Project would not be a substantial source of TACs. The Project will not result in a high carcinogenic or non-carcinogenic risk during operation.

Naturally Occurring Asbestos

Another potential air quality issue associated with construction-related activities is the airborne entrainment of asbestos due to the disturbance of naturally-occurring asbestos-containing soils. The proposed Project is not located within an area designated by the State of California as likely to contain naturally-occurring asbestos (Department of Conservation [DOC] 2000). As a result, construction-related activities would not be anticipated to result in increased exposure of sensitive land uses to asbestos.

Carbon Monoxide Hot Spots

It has long been recognized that CO exceedances are caused by vehicular emissions, primarily when idling at intersections. Concentrations of CO are a direct function of the number of vehicles, length of delay, and traffic flow conditions. Under certain meteorological conditions, CO concentrations close to congested intersections that experience high levels of traffic and elevated background concentrations may reach unhealthy levels, affecting nearby sensitive receptors. Given the high traffic volume potential, areas of high CO concentrations, or “hot spots,” are typically associated with intersections that are projected to operate at unacceptable levels of service during the peak commute hours. It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. However, transport of this criteria pollutant is extremely limited, and CO disperses rapidly with distance from the source under normal meteorological conditions. Furthermore, vehicle emissions standards have become increasingly more stringent in the last 20 years. In 1993, much of the state was designated nonattainment under the California Ambient Air Quality Standards (CAAQS) and NAAQS for CO. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration across the entire state is now designated as attainment. Detailed modeling of project-specific CO “hot spots” is not necessary and thus this potential impact is addressed qualitatively.

A CO “hot spot” would occur if an exceedance of the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9 ppm were to occur. The analysis prepared for CO attainment in the South Coast Air Quality Management District’s (SCAQMD’s) *1992 Federal Attainment Plan for Carbon Monoxide* in Los Angeles County and a Modeling and Attainment Demonstration prepared by the SCAQMD as part of the 2003 AQMP can be used to demonstrate the potential for CO exceedances of these standards. The SCAQMD conducted a CO hot spot analysis as part of the 1992 CO Federal Attainment Plan at four busy intersections in Los Angeles County during the peak morning and afternoon time periods. The intersections evaluated included Long Beach Boulevard and Imperial Highway (Lynwood), Wilshire Boulevard and Veteran Avenue (Westwood), Sunset Boulevard and Highland Avenue (Hollywood), and La Cienega Boulevard and Century Boulevard (Inglewood). The busiest intersection evaluated was at Wilshire Boulevard and Veteran Avenue, which has a traffic volume of approximately 100,000 vehicles per day. Despite this level of traffic, the CO analysis concluded that there was no violation of CO standards (SCAQMD 1992). In order to establish a more accurate record of baseline CO concentrations affecting the South Coast Air Basin, a CO “hot spot” analysis was conducted in 2003 at the same four busy intersections in Los Angeles at the peak morning and afternoon time periods. This “hot spot” analysis did not predict any violation of CO standards. The highest one-hour concentration was measured at 4.6 ppm at Wilshire Boulevard and Veteran Avenue and the highest eight-hour concentration was measured at 8.4 ppm at Long Beach Boulevard and Imperial Highway.

Similar considerations are also employed by other air districts when evaluating potential CO concentration impacts. Specifically, the Bay Area Air Quality Management District (BAAQMD), the air district for the San Francisco Bay Area, concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact.

According to the traffic analysis prepared for the project (Michael Baker International 2020), the Project is anticipated to generate 1,320 daily trips on average. Because the proposed project would not increase traffic volumes at any intersection to more than 100,000 vehicles per day, or even 44,000 vehicles per day, there is no likelihood of the Project traffic exceeding CO values. CO "hot spots" are not an environmental impact of concern for the Project. Localized air quality impacts related to mobile source emissions would not be a concern.

Odors

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Construction

During construction, the proposed project presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the site. However, these emissions are short-term in nature and will rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the construction area. Given that there are no natural topographic features (e.g., canyon walls) or manmade structures (e.g., tall buildings) that would potential trap such emissions, construction-related odors would occur at magnitudes that would not affect substantial numbers of people.

Operations

According the CARB Air Quality and Land Use Handbook: A Community Health Perspective (2020b), the sources of the most common operational odor complaints received by local air districts include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations. The project does not contain any of the land uses identified as typically associated with emissions of objectionable odors.

3.0 GREENHOUSE GAS EMISSIONS

3.1 Greenhouse Gas Setting

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead trapped, resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Prominent GHGs contributing to the greenhouse effect are CO_2, methane (CH_4), and N_2O. Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Fluorinated gases include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride; however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic factors together (Intergovernmental Panel on Climate Change [IPCC] 2014).

Table 3-1 describes the primary GHGs attributed to global climate change, including their physical properties, primary sources, and contributions to the greenhouse effect.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2 (IPCC 2014). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its global warming potential. Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, or other forms. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013).

Table 3-1. Greenhouse Gases

Greenhouse Gas	Description
CO_2	Carbon dioxide is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.[1]
CH_4	Methane is a colorless, odorless gas and is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH_4 is about12 years.[2]
N_2O	Nitrous oxide is a clear, colorless gas with a slightly sweet odor. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.[3]

Sources: [1]USEPA 2016a, [2] USEPA 2016b, [3] USEPA 2016c

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; it is sufficient to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

3.1.1 Sources of Greenhouse Gas Emissions

In 2020, CARB released the 2020 edition of the California GHG inventory covering calendar year 2018 emissions. In 2018, California emitted 425.3 million gross metric tons of CO_2e including from imported electricity. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2018, accounting for approximately 30 percent of total GHG emissions in the state. This sector was followed by the industrial sector (21 percent) and the electric power sector including both in-state and out-of-state sources (15 percent) (CARB 2020c). Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. Carbon dioxide sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water), respectively, two of the most common processes for removing CO_2 from the atmosphere.

3.2 Regulatory Framework

3.2.1 State

Executive Order S-3-05

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the EO established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

Assembly Bill 32 Climate Change Scoping Plan and Updates

In 2006, the California legislature passed Assembly Bill (AB) 32 (Health and Safety Code § 38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions). Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008, which outlines measures to meet the 2020 GHG reduction goals. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by the end of 2020.

The Scoping Plan is required by AB 32 to be updated at least every five years. The latest update, the 2017 Scoping Plan Update, addresses the 2030 target established by Senate Bill (SB) 32 as discussed below and establishes a proposed framework of action for California to meet a 40 percent reduction in GHG emissions by 2030 compared to 1990 levels. The key programs that the Scoping Plan Update builds on include increasing the use of renewable energy in the state, the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and reduction of methane emissions from agricultural and other wastes.

Senate Bill 32 and Assembly Bill 197 of 2016

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include § 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by Executive Order (EO) B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

Senate Bill 100 of 2018

In 2018, SB 100 was signed by Governor Brown, codifying a goal of 60 percent renewable procurement by 2030 and 100 percent by 2045 Renewables Portfolio Standard.

2019 Building Energy Efficiency Standards for Residential and Nonresidential Buildings

The Building and Efficiency Standards (Energy Standards) were first adopted and put into effect in 1978 and have been updated periodically in the intervening years. These standards are a unique California asset that have placed the State on the forefront of energy efficiency, sustainability, energy independence and climate change issues. The 2019 Building Energy Efficiency Standards improve upon the 2016 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 update to the Building Energy Efficiency Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The 2019 standards are a major step toward meeting Zero Net Energy. The most significant efficiency improvement to the residential Standards include the introduction of photovoltaic into the perspective package, improvements for attics, walls, water heating and lighting. Buildings permitted on or after January 1, 2020, must comply with the 2019 Standards.

In 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as CalGreen Building Standard (CalGreen), and establishes voluntary and mandatory standards pertaining to the planning and design of sustainable site development, energy efficiency, water conservation, material conservation, and interior air quality. Like Part 6 of Title 24, the CalGreen standards are periodically updated, with increasing energy savings and efficiencies associated with each code update. CalGreen contains voluntary "Tier 1" and "Tier 2" standards that are not mandatory statewide but could be required by a City or County. These are 'reach' standards that can be adopted by local jurisdictions and may be incorporated as mandatory standards in future code cycles.

3.3 Greenhouse Gas Emissions Impact Assessment

3.3.1 Thresholds of Significance

The impact analysis provided below is based on the following CEQA Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to greenhouse gas emissions if it would:

1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

2) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases or

The Appendix G thresholds for GHG's do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA. With respect to GHG emissions, the CEQA Guidelines § 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or other performance-based standards." (14 California Code of Regulations [CCR] 15064.4(b)). A lead agency may use a "model or methodology" to estimate GHG emissions and has the discretion to select the model or methodology it considers "most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change." (14 CCR 15064.4(c)). Section 15064.4(b) provides that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment:

1. The extent a project may increase or reduce GHG emissions as compared to the existing environmental setting.

2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

In addition, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence" (14 CCR 15064.7(c)). The CEQA Guidelines also clarify that the effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see CEQA Guidelines § 15130(f)). As a note, the CEQA Guidelines were amended in response to SB 97. In particular, the CEQA Guidelines were amended to specify that compliance with a GHG emissions reduction plan renders a cumulative impact insignificant.

Per CEQA Guidelines § 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project would comply with an approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include a "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plans [and] plans or regulations for the reduction of greenhouse gas emissions." Put another way, CEQA Guidelines § 15064(h)(3) allows a lead agency to make a finding of less than significant for GHG emissions if a project complies with adopted programs, plans, policies and/or other regulatory strategies to reduce GHG emissions.

The significance of the Project's GHG emissions is evaluated consistent with CEQA Guidelines § 15064.4(b)(2) by considering whether the Project complies with applicable plans, policies, regulations and requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

3.3.2 Project Significance Thresholds

To date neither the ICAPCD nor the City of El Centro have adopted GHG significance thresholds applicable to potential development. As previously described, Section 15064.7(c) of the CEQA Guidelines specifies that "[w]hen adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence" (14 CCR 15064.7(c)). Thus, in the absence of any GHG emissions significance thresholds the projected emissions are compared to the South Coast Air Quality Management (SCAQMD) numeric threshold of 3,000 metric tons of CO_2e annually. While significance thresholds used in the South Coast Air Basin are not binding on the ICAPCD or El Centro, they are instructive for comparison purposes. This threshold is also appropriate as the SCAQMD GHG thresholds were formulated based on similar geography and climate patterns as found in Imperial County and are also employed for use in CEQA GHG analyses in the Riverside County portion of the SSAB, the same air basin that encompasses the proposed project. Therefore, the 3,000-metric ton of CO_2e threshold is appropriate for this analysis. The Project is also assessed for consistency with regulations or requirements adopted by the 2008 Climate Change Scoping Plan and subsequent updates.

In *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal. 4th 2014, 213, 221, 227, following its review of various potential GHG thresholds proposed in an academic study [Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203], the California Supreme Court identified the use of numeric bright-line thresholds as a potential pathway for compliance with CEQA GHG requirements. The study found numeric bright line thresholds designed to determine when small projects were so small as to not cause a cumulatively considerable impact on global climate change was consistent with CEQA. Specifically, Public Resources Code section 21003(f) provides it is a policy of the state that "[a]ll persons and public agencies involved in the environmental review process be responsible for carrying out the process in the most efficient, expeditious manner in order to conserve the available financial, governmental, physical and social resources with the objective that those resources may be better applied toward the mitigation of actual significant effects on the environment." The Supreme Court-reviewed study noted, "[s]ubjecting the smallest projects to the full panoply of CEQA requirements, even though the public benefit would be minimal, would not be consistent with implementing the statute in the most efficient, expeditious manner. Nor would it be consistent with applying lead agencies' scarce resources toward mitigating actual significant climate change impacts." (Crockett, *Addressing the Significance of Greenhouse Gas Emissions: California's Search for Regulatory Certainty in an Uncertain World* (July 2011), 4 Golden Gate U. Envtl. L. J. 203, 221, 227.)

3.3.3 Methodology

Where GHG emission quantification was required, emissions were modeled using CalEEMod, version 2016.3.2. CalEEMod is a statewide land use emissions computer model designed to quantify potential GHG emissions associated with both construction and operations from a variety of land use projects. Construction generated GHG emissions were calculated using a combination of model defaults for

Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required. Operational GHG emissions were calculated using a combination of model defaults for Imperial County and an estimated a project trip generation rate of 1,320 average daily trips provided by Michael Baker International (2020).

3.3.4 Impact Analysis

Generation of GHG Emissions

Construction

Construction-related activities that would generate GHG emissions include worker commute trips, haul trucks carrying supplies and materials to and from the project site, and off-road construction equipment (e.g., dozers, loaders, excavators). Table 3-2 illustrates the specific construction generated GHG emissions that would result from construction of the project. Once construction is complete, the generation of these GHG emissions would cease.

Table 3-2. Construction-Related Greenhouse Gas Emissions

Emissions Source	CO_2e (Metric Tons/ Year)
Year 2021	498
Year 2022	309
Significance Threshold	*3,000*
Exceed Significance Threshold?	**No**

Source: CalEEMod version 2016.3.2. Construction generated air pollutant emissions were calculated using a combination of model defaults for Imperial County, project site plans, and specific data provided by the project applicant including equipment used, duration of specific construction phases, and the amount of soil movement required (14,000 cubic yards of cut material and 23,000 cubic yards of fill material). Refer to Attachment A for Model Data Outputs.

As shown in Table 3-2, Project construction would not exceed the significance threshold for GHG emissions. Once construction is complete, the generation of these GHG emissions would cease.

Operations

Operation of the Project would result in an increase in GHG emissions primarily associated with motor vehicle trips and onsite energy sources. Long-term operational GHG emissions attributed to the project are identified in Table 3-3.

Table 3-3. Operational-Related Greenhouse Gas Emissions

Emission Source	CO_2e (Metric Tons/ Year)
Area Source	2
Energy	687
Mobile	1,453
Waste	42
Water	152
Total	2,336
Significance Threshold	*3,000*
Exceed Significance Threshold?	**No**

Source: CalEEMod version 2016.3.2. Operational emissions were calculated using a combination of model defaults for Imperial County and an estimated project trip generation rate of 1,320 average daily trips. Refer to Attachment A for Model Data Outputs.

As shown in Table 3-3, the proposed project would generate approximately 2,336 metric tons of CO_2e per year during operations, which is below the significance threshold of 3,000 metric tons of CO_2e per year.

Conflict with any Applicable Plan, Policy, or Regulation of an Agency Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases

The City of El Centro does not currently have an adopted plan for the purpose of reducing GHG emissions. However, as previously described the State of California promulgates several mandates and goals to reduce statewide GHG emissions, including the goal to reduce statewide GHG emissions to 40 percent below 1990 levels by the year 2030 and 80 percent below 1990 levels by the year 2050 (SB 32). The proposed project is subject to compliance with SB 32. As discussed previously, the proposed project generated GHG emissions would not surpass GHG significance thresholds, which were prepared with the purpose of complying with these requirements. Additionally, the project is consistent with regulations or requirements adopted by the 2008 Climate Change Scoping Plan and subsequent updates. The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of SB 32 and establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan (approved by CARB in 2008 and updated in 2014 and 2017) provides a framework for actions to reduce California's GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. The Scoping Plan is not directly applicable to specific projects, nor is it intended to be used for project-level evaluations. It does not provide recommendations for lead agencies to develop evidence-based numeric thresholds consistent with the Scoping Plan, the state's long-term GHG goals, and climate change science. Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others.

Table 3-4 highlights measures that have been, or will be, developed under the Scoping Plan and presents the project's consistency with Scoping Plan measures.

Table 3-4. Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Proposed Project Consistency
Transportation Sector		
Advanced Clean Cars	T-1	*Consistent*. The project's residents would purchase vehicles in compliance with CARB vehicle standards that are in effect at the time of vehicle purchase.
Low Carbon Fuel Standard	T-2	*Consistent*. Motor vehicles driven by the project's residents and customers would use compliant fuels.
Regional Transportation-Related GHG Targets	T-3	*Consistent*. The project would result in a GHG per capita that is less than that project for the region within the Southern California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy planning area.
Advanced Clean Transit	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
Last-Mile Delivery	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
Reduction in VMT	N/A	*Consistent*. According to the VMT analysis prepared for the project (Chen Ryan 2020), the project would result in a GHG per capita that is less than that projected for the county.
Vehicle Efficiency Measure 1. Tire Pressure 2. Fuel Efficiency Tire Program 3. Low-Friction Oil 4. Solar-Reflective Automotive Paint and Window Glazing	T-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Ship Electrification at Ports (Shore Power)	T-5	*Not applicable*. The project would not prevent CARB from implementing this measure.
Goods Movement Efficiency Measures 1. Port Drayage Trucks 2. Transport Refrigeration Units Cold Storage Prohibition 3. Cargo Handling Equipment, Anti-Idling, Hybrid, Electrification 4. Goods Movement Systemwide Efficiency Improvements 5. Commercial Harbor Craft Maintenance and Design Efficiency 6. Clean Ships 7. Vessel Speed Reduction	T-6	*Not applicable*. The project would not prevent CARB from implementing this measure.

Table 3-4. Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Proposed Project Consistency
Heavy-Duty Vehicle GHG Emission Reduction • Tractor-Trailer GHG Regulation • Heavy-Duty GHG Standards for New Vehicle and Engines (Phase I)	T-7	*Not applicable*. The project would not prevent CARB from implementing this measure.
Medium- and Heavy-Duty Vehicle Hybridization Voucher Incentive Proposed Project	T-8	*Not applicable*. The project would not prevent CARB from implementing this measure.
Medium and Heavy-Duty GHG Phase 2	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
High-Speed Rail	T-9	*Not applicable*. The project would not prevent CARB from implementing this measure.
Electricity and Natural Gas Sector		
Energy Efficiency Measures (Electricity)	E-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Energy Efficiency Measures (Natural Gas)	CR-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Solar Water Heating (California Solar Initiative Thermal Program)	CR-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Combined Heat and Power	E-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Renewables Portfolio Standard (33% by 2020)	E-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Renewables Portfolio Standard (60% by 2030)	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure.
SB 1 Million Solar Roofs (California Solar Initiative, New Solar Home Partnership, Public Utility Programs) and Earlier Solar Programs	E-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Water Sector		
Water Use Efficiency	W-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Water Recycling	W-2	*Not applicable*. The project would not prevent CARB from implementing this measure.
Water System Energy Efficiency	W-3	*Not applicable*. The project would not prevent CARB from implementing this measure.
Reuse Urban Runoff	W-4	*Not applicable*. The project would not prevent CARB from implementing this measure.
Renewable Energy Production	W-5	*Not applicable*. The project would not prevent CARB from implementing this measure.
Green Buildings		

Table 3-4. Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Proposed Project Consistency
State Green Building Initiative: Leading the Way with State Buildings (Greening New and Existing State Buildings)	GB-1	*Not applicable*. The project would not prevent CARB from implementing this measure.
Green Building Standards Code (Greening New Public Schools, Residential and Commercial Buildings)	GB-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Beyond Code: Voluntary Programs at the Local Level (Greening New Public Schools, Residential, and Commercial Buildings	GB-1	*Consistent.* The project would be constructed in accordance with Title 24 building standards.
Greening Existing Buildings (Greening Existing Homes and Commercial Buildings)	GB-1	*Not applicable*. The project would not prevent CARB from implementing this measure
Industry Sector		
Energy Efficiency and Co-Benefits Audits for Large Industrial Sources	I-1	*Not applicable*. The project would not prevent CARB from implementing this measure
Oil and Gas Extraction GHG Emissions Reduction	I-2	*Not applicable*. The project would not prevent CARB from implementing this measure
Reduce GHG Emissions by 20% in Oil Refinery Sector	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure
GHG Emissions Reduction from Natural Gas Transmission and Distribution	I-3	*Not applicable*. The project would not prevent CARB from implementing this measure
Refinery Flare Recovery Process Improvements	I-4	*Not applicable*. The project would not prevent CARB from implementing this measure
Work with the Local Air Districts to Evaluate Amendments to Their Existing Leak Detection and Repair Rules for Industrial Facilities to Include Methane Leaks	I-5	*Not applicable*. The project would not prevent CARB from implementing this measure
Recycling and Waste Management Sector		
Landfill Methane Control Measure	RW-1	*Not applicable.* The project would not prevent CARB from implementing this measure
Increasing the Efficiency of Landfill Methane Capture	RW-2	*Not applicable*. The project would not prevent CARB from implementing this measure
Mandatory Commercial Recycling	RW-3	*Consistent.* The project would include recycling during both construction and operation consistent with the requirements of the Title 24 Building Standards
Increase Production and Markets for Compost and Other Organics	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure
Anaerobic/Aerobic Digestion	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure
Extended Producer Responsibility	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure
Environmentally Preferable Purchasing	RW-3	*Not applicable*. The project would not prevent CARB from implementing this measure

Table 3-4. Project Consistency with Scoping Plan GHG Emission Reduction Strategies

Scoping Plan Measure	Measure Number	Proposed Project Consistency
	Forests Sector	
Sustainable Forest Target	F-1	*Not applicable*. The project would not prevent CARB from implementing this measure
Motor Vehicle Air Condition Systems: Reduction of Refrigerant Emissions from Non-Professional Servicing	H-1	*Not applicable*. The project would not prevent CARB from implementing this measure
SF_6 Limits in Non-Utility and Non-Semiconductor Applications	H-2	*Not applicable*. The project would not prevent CARB from implementing this measure
Reduction of Perfluorocarbons (PFCs) in Semiconductor Manufacturing	H-3	*Not applicable*. The project would not prevent CARB from implementing this measure
Limit High GWP Use in Consumer Products	H-4	*Not applicable*. The project would not prevent CARB from implementing this measure
Air Conditioning Refrigerant Leak Test During Vehicle Smog Check	H-5	*Not applicable.* The project would not prevent CARB from implementing this measure
Stationary Equipment Refrigerant Management Program – Refrigerant Tracking/Reporting/Repair Program	H-6	*Not applicable*. The project would not prevent CARB from implementing this measure
Stationary Equipment Refrigerant Management Program – Specifications for Commercial and Industrial Refrigeration	H-6	*Not applicable.* The project would not prevent CARB from implementing this measure
SF_6 Leak Reduction Gas Insulated Switchgear	H-6	*Not applicable*. The project would not prevent CARB from implementing this measure
40% Reduction in Methane and Hydrofluorocarbon (HFC) Emissions	N/A	*Not applicable*. The project would not prevent CARB from implementing this measure
50% Reduction in Black Carbon Emissions	N/A	*Not applicable.* The project would not prevent CARB from implementing this measure
	Agriculture Sector	
Methane Capture at Large Dairies	A-1	*Not applicable.* The project would not prevent CARB from implementing this measure

As shown, the project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law and to the extent that they are applicable to the project.

The project would not impede the attainment of the GHG reduction goals for 2030 or 2050 identified in EO S-03-05 and SB 32. EO S-03-05 establishes the following goals: GHG emissions should be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. SB 32 establishes for a statewide GHG emissions reduction target whereby CARB, in adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, shall ensure that statewide GHG emissions are reduced to at least 40 percent below 1990 levels by December 31, 2030. While there are no established protocols or thresholds of significance for that future year analysis, CARB forecasts that compliance with the current Scoping Plan puts the state on a trajectory toward meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014).

To begin, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the First Update to the Climate Change Scoping Plan that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014). With regard to the 2050 target for reducing GHG emissions to 80 percent below 1990 levels, the First Update to the Climate Change Scoping Plan states the following (CARB 2014):

> *This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions*.

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-03-05. This is confirmed in the Second Update, which states (CARB 2017a):

> *The Proposed Plan builds upon the successful framework established by the Initial Scoping Plan and First Update, while also identifying new, technologically feasibility and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health, including in disadvantaged communities. The Proposed Plan is developed to be consistent with requirements set forth in AB 32, SB 32, and AB 197.*

As discussed previously, the project is consistent with the GHG emission reduction measures in the Scoping Plan and would not conflict with the state's trajectory toward future GHG reductions. In addition, since the specific path to compliance for the state in regard to the long-term goals will likely require development of technology or other changes that are not currently known or available, specific additional mitigation measures for the project would be speculative and cannot be identified at this time. The project's consistency would assist in meeting the City's contribution to GHG emission reduction targets in California. With respect to future GHG targets under SB 32 and EO S-03-05, CARB has also made clear its legal interpretation is that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet SB 32's 40 percent reduction target by 2030 and EO S-03-05's 80 percent reduction target by 2050; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets. The project would not interfere with implementation of any of the previously described GHG reduction goals for 2030 or 2050 or impede the state's trajectory toward the previously described statewide GHG reduction goals for 2030 or 2050.

The project would not conflict with any adopted plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

4.0 ENERGY

4.1 Energy Environmental Setting

Energy consumption is analyzed in this analysis due to the potential direct and indirect environmental impacts associated with the project. Such impacts include the depletion of nonrenewable resources (oil, natural gas, coal, etc.) during both the construction and long-term operational phases.

4.2 Energy Types and Sources

California relies on a regional power system comprised of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Natural gas provides California with a majority of its electricity followed by renewables, large hydroelectric and nuclear (CEC 2019). The Imperial Irrigation District (IID) provides electricity to all of Imperial County, including the project site, along with parts of Riverside and San Diego Counties. Its service territory covers 6,471 square miles and serves more than 145,000 customers. IID Energy works to meet customers' demands at the best possible rates. Nearly 60 percent of their power is supplied locally using hydroelectric facilities, a steam generating facility, several gas turbines and a diesel unit. The Southern California Gas Company provides natural gas services to the Project area. Southern California Gas services approximately 21.6 million customers, spanning roughly 20,000 square miles of California.

4.3 Energy Consumption

Electricity use is measured in kilowatt-hours (kWh), and natural gas use is measured in therms. Vehicle fuel use is typically measured in gallons (e.g. of gasoline or diesel fuel), although energy use for electric vehicles is measured in kWh.

The electricity consumption associated with all residential uses in Imperial County from 2015 to 2019 is shown in Table 4-1. As indicated, the demand has increased since 2015.

Table 4-1. Residential Electricity Consumption in Imperial County 2015-2019

Year	Electricity Consumption (kilowatt hours)
2019	575,201,252
2018	636,271,713
2017	627,716,680
2016	544,540,489
2015	534,110,851

Source: California Energy Commission (CEC) 2019

The natural gas consumption associated with all residential uses in Imperial County from 2015 to 2019 is shown in Table 4-2. As indicated, the demand has increased since 2015.

Table 4-2. Residential Natural Gas Consumption in Imperial County 2015-2019	
Year	**Natural Gas Consumption (therms)**
2019	8,177,465
2018	7,570,068
2017	7,351,419
2016	7,381,508
2015	7,278,246

Source: CEC 2019

Automotive fuel consumption in Imperial County from 2016 to 2020 is shown in Table 4-3. Fuel consumption has decreased between 2016 and 2020.

Table 4-3. Automotive Fuel Consumption in Imperial County 2016-2020	
Year	**Total Fuel Consumption (gallons)**
2020	196,177,597
2019	198,822,094
2018	201,793,138
2017	204,312,157
2016	208,822,214

Source: CARB 2017b

4.4 Energy Impact Assessment

4.4.1 Thresholds of Significance

The impact analysis provided below is based on the following CEQA Guidelines Appendix G thresholds of significance. The Project would result in a significant impact to energy if it would do any of the following:

1. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

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

The analysis focuses on the four sources of energy that are relative to the proposed project: electricity, natural gas, the equipment-fuel necessary for project construction, and the automotive fuel necessary for project operations. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, and unnecessary consumption of energy for a proposed project. For the purpose of this analysis, the amount of electricity and natural gas estimated to be consumed by the project is quantified and compared to that consumed by all residential land uses in Imperial County. Similarly, the amount of fuel necessary for project construction and operations are calculated and compared to that consumed in Imperial County.

4.4.2 Methodology

Levels of construction and operational related energy consumption estimated to be consumed by the project include the number of kWh of electricity, therms of natural gas, and gallons of gasoline. Energy use quantification was based on project specific information such as the estimated traffic trip generation rates from Michael Baker International (2020) and project site plans. Energy consumption estimates were calculated using CalEEMod, version 2016.3.2. CalEEMod is a statewide land use computer model designed to quantify resources associated with both construction and operations from a variety of land use projects.

4.4.3 Impact Analysis

Would the Project Result in Potentially Significant Environmental Impact Due to Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources, during Project Construction or Operation?

The impact analysis focuses on the four sources of energy that are relevant to the proposed Project: electricity, natural gas, the equipment-fuel necessary for project construction, and the automotive fuel necessary for project operations. Addressing energy impacts requires an agency to make a determination as to what constitutes a significant impact. There are no established thresholds of significance, statewide or locally, for what constitutes a wasteful, inefficient, and unnecessary consumption of energy for a proposed land use project. For the purpose of this analysis, the amount of electricity and natural gas estimated to be consumed by the project is quantified and compared to that consumed by all residential land uses in Imperial County. Similarly, the amount of fuel necessary for project construction and operations are calculated and compared to that consumed in Imperial County.

The analysis of electricity gas usage is based on CalEEMod modeling conducted by ECORP Consulting, which quantifies energy use for project operations. The amount of operational automotive fuel use was estimated using the CARB's EMFAC2017 computer program, which provides projections for typical daily fuel usage in Imperial County. The amount of total construction-related fuel use was estimated using ratios provided in the Climate Registry's General Reporting Protocol for the Voluntary Reporting Program, Version 2.1. Energy consumption associated with the proposed project is summarized in Table 4-4.

Table 4-4. Proposed Project Energy and Fuel Consumption

Energy Type	Annual Energy Consumption	Percentage Increase Countywide
Electricity Consumption[1]	928,747 kilowatt-hours	0.16 percent
Natural Gas[1]	28,034 therms	0.34 percent
Automotive Fuel Consumption		
Project Construction 2021[2] Project Construction 2022[2]	49,064 gallons 30,443 gallons	0.02 percent 0.01 percent
Project Operations[3]	159,507 gallons	0.08 percent

Source: [1]CalEEMod; [2]Climate Registry 2016; [3]EMFAC2017 (CARB 2017b)

Notes: The Project increases in electricity and natural gas consumption are compared with all of the residential buildings in Imperial County in 2019, the latest data available. The Project increases in automotive fuel consumption are compared with the countywide fuel consumption in 2020, the most recent full year of data.

Operations of the proposed project would include electricity and natural gas usage from lighting, space and water heating, and landscape maintenance activities. As shown in Table 4-4, the annual electricity consumption due to operations would be 928,747 kilowatt-hours resulting in an approximate 0.16 percent increase in the typical annual electricity consumption attributable to all residential uses in Imperial County. However, this is potentially a conservative estimate. In September 2018 Governor Jerry Brown Signed EO B-55-18, which established a new statewide goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." Carbon neutrality refers to achieving a net zero CO_2 emissions. This can be achieved by reducing or eliminating carbon emissions, balancing carbon emissions with carbon removal, or a combination of the two. This goal is in addition to existing statewide targets for GHG emission reduction. Governor's Executive Order B-55-18 requires CARB to "work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal." Furthermore, the Project's increase in natural gas usage of 0.34 percent across all residential uses in the County would also be negligible. For these reasons, the project would not result in the inefficient, wasteful, or unnecessary consumption of building energy.

Fuel necessary for project construction would be required for the operation and maintenance of construction equipment and the transportation of materials to the project site. The fuel expenditure necessary to construct the physical building and infrastructure would be temporary, lasting only as long as project construction. As further indicated in Table 4-4, the project's gasoline fuel consumption during the one-time construction period is estimated to be 49,064 gallons of fuel during 2021 construction and 30,443 gallons of fuel during 2022 construction. This would increase the annual countywide gasoline fuel use in the county by 0.02 percent and 0.01 percent respectively. As such, project construction would have a nominal effect on local and regional energy supplies. No unusual project characteristics would necessitate the use of construction equipment that would be less energy efficient than at comparable construction sites in the region or the state. Construction contractors would purchase their own gasoline and diesel fuel from local suppliers and would judiciously use fuel supplies to minimize costs due to waste and subsequently maximize profits. Additionally, construction equipment fleet turnover and increasingly stringent state and federal regulations on engine efficiency combined with state regulations limiting engine idling times and requiring recycling of construction debris, would further reduce the amount of transportation fuel demand during project construction. For these reasons, it is expected that construction fuel consumption associated with the project would not be any more inefficient, wasteful, or unnecessary than other similar development projects of this nature.

Per information provided by Michael Baker International (2020), the project is estimated to generate approximately 1,320 daily trips. As indicated in Table 4-4, this would estimate to a consumption of approximately 159,507 gallons of automotive fuel per year, which would increase the annual countywide automotive fuel consumption by 0.08 percent. The amount of operational fuel use was estimated using CARB's EMFAC2017 computer program, which provides projections for typical daily fuel usage in Imperial County. This analysis conservatively assumes that all of the automobile trips projected to arrive at the project during operations would be new to Imperial County. Further, a liberal approach was taken for vehicle trip estimation to ensure potential impacts due to operational gasoline usage were adequately accounted. Fuel consumption associated with vehicle trips generated by the project would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region.

Would the Project Conflict with or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency?

The project would be designed in a manner that is consistent with relevant energy conservation plans designed to encourage development that results in the efficient use of energy resources. The project would be built to the Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations (Title 24). Title 24 was established in 1978 in response to a legislative mandate to reduce California's energy consumption. Title 24 is updated approximately every three years; the 2013 standards became effective July 1, 2014. The 2016 Title 24 updates went into effect on January 1, 2017. The 2019 Energy Standards improve upon the 2016 Energy Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 update to the Energy Standards focuses on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The 2019 Energy Standards are a major step toward meeting Zero Net Energy. Buildings permitted on or after January 1, 2020, must comply with the 2019 Standards. Compliance with Title 24 is mandatory at the time new building permits are issued by city and county governments. Additionally, in January 2010, the State of California adopted the California Green Building Standards Code (CalGreen) that establishes mandatory green building standards for all buildings in California. The code was subsequently updated in 2013. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. Furthermore, the project would also be consistent with the City's General Plan, specifically Energy Conservation Implementation Program COS-20, which encourages project proponents to incorporate energy conservation techniques through the implementation of State energy performance standards.

5.0 REFERENCES

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LIST OF ATTACHMENTS

Attachment A – CalEEMod Output Files Criteria Air Pollutants & Greenhouse Gas Emissions

Attachment B- Project Construction and Operational Fuel Consumption

ATTACHMENT A

CalEEMod Output Files – Criteria Air Pollutants & Greenhouse Gas Emissions

El Centro Town Center

Imperial County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	385.00	Space	3.46	154,000.00	0
Apartments Low Rise	180.00	Dwelling Unit	8.10	180,000.00	581

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage updated to match project site plan

Construction Phase - Building contrtuction, paving and architectural coating will be conducted at the same time

Off-road Equipment -

Off-road Equipment - information supplied by applicant

Off-road Equipment - Information supplied by applicant

Off-road Equipment - information supplied by applicant

Off-road Equipment - Information provided by applicant

On-road Fugitive Dust - location surrounded by paved roads

Grading - Import/Export material information obtained from construction questionnaire

Vehicle Trips - Updated to match traffic report. ADT= 1320

Road Dust - site location surrounded by paved roadways

Woodstoves - Assumed no fireplaces or wood stoves based on project type and location

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	40
tblConstructionPhase	NumDays	20.00	347.00
tblConstructionPhase	NumDays	300.00	347.00
tblConstructionPhase	NumDays	30.00	21.00
tblConstructionPhase	NumDays	20.00	86.00
tblConstructionPhase	NumDays	10.00	23.00
tblFireplaces	FireplaceWoodMass	2,080.00	0.00
tblFireplaces	NumberGas	99.00	0.00

tblGrading	AcresOfGrading	42.00	75.00
tblGrading	MaterialExported	0.00	7,000.00
tblGrading	MaterialExported	0.00	7,000.00
tblGrading	MaterialImported	0.00	11,500.00
tblGrading	MaterialImported	0.00	11,500.00
tblLandUse	LotAcreage	11.25	8.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	RoadSiltLoading	0.10	0.50

tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblRoadDust	RoadPercentPave	50	100
tblRoadDust	RoadSiltLoading	0.1	0.5
tblTripsAndVMT	HaulingTripNumber	2,313.00	2,312.00
tblTripsAndVMT	HaulingTripNumber	2,313.00	2,312.00
tblVehicleTrips	ST_TR	7.16	7.35
tblVehicleTrips	SU_TR	6.07	7.35
tblVehicleTrips	WD_TR	6.59	7.35

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	10.0341	45.8747	26.6638	0.1140	10.9067	0.9115	11.7710	2.1965	0.8466	2.9944	0.0000	11,726.0499	11,726.0499	1.2291	0.0000	11,756.7778
2022	9.7611	17.9586	25.5051	0.0475	6.4312	0.7867	7.2179	1.6206	0.7306	2.3512	0.0000	4,729.4964	4,729.4964	0.7352	0.0000	4,747.8754
Maximum	**10.0341**	**45.8747**	**26.6638**	**0.1140**	**10.9067**	**0.9115**	**11.7710**	**2.1965**	**0.8466**	**2.9944**	**0.0000**	**11,726.0499**	**11,726.0499**	**1.2291**	**0.0000**	**11,756.7778**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	10.0341	45.8747	26.6638	0.1140	10.9067	0.9115	11.7710	2.1965	0.8466	2.9944	0.0000	11,726.0499	11,726.0499	1.2291	0.0000	11,756.7778
2022	9.7611	17.9586	25.5051	0.0475	6.4312	0.7867	7.2179	1.6206	0.7306	2.3512	0.0000	4,729.4964	4,729.4964	0.7352	0.0000	4,747.8754
Maximum	**10.0341**	**45.8747**	**26.6638**	**0.1140**	**10.9067**	**0.9115**	**11.7710**	**2.1965**	**0.8466**	**2.9944**	**0.0000**	**11,726.0499**	**11,726.0499**	**1.2291**	**0.0000**	**11,756.7778**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720
Energy	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Mobile	3.7342	20.5361	35.2109	0.0909	18.1647	0.0395	18.2043	4.5669	0.0370	4.6039		9,295.7037	9,295.7037	0.6459		9,311.8517
Total	**8.8094**	**21.4155**	**50.4050**	**0.0963**	**18.1647**	**0.1791**	**18.3439**	**4.5669**	**0.1766**	**4.7435**	**0.0000**	**10,226.1245**	**10,226.1245**	**0.6892**	**0.0166**	**10,248.2905**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720
Energy	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Mobile	3.4883	19.2931	28.1444	0.0723	12.7153	0.0301	12.7454	3.1968	0.0282	3.2250		7,400.6788	7,400.6788	0.5630		7,414.7541
Total	**8.5636**	**20.1725**	**43.3384**	**0.0776**	**12.7153**	**0.1697**	**12.8850**	**3.1968**	**0.1677**	**3.3646**	**0.0000**	**8,331.0996**	**8,331.0996**	**0.6063**	**0.0166**	**8,351.1928**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	2.79	5.80	14.02	19.41	30.00	5.26	29.76	30.00	5.01	29.07	0.00	18.53	18.53	12.03	0.00	18.51

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2021	3/31/2021	5	23	
2	Grading	Grading	4/1/2021	4/29/2021	5	21	
3	Building Construction	Building Construction	5/1/2021	8/30/2022	5	347	
4	Architectural Coating	Architectural Coating	5/1/2021	8/30/2022	5	347	
5	Paving	Paving	12/1/2021	3/30/2022	5	86	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 3.46

Residential Indoor: 364,500; Residential Outdoor: 121,500; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,240 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	0	8.00	158	0.38
Grading	Graders	2	8.00	187	0.41
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Trenchers	1	8.00	78	0.50
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	3.00	0.00	2,312.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	2,312.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	194.00	44.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	39.00	0.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1602	0.0000	0.1602	0.0243	0.0000	0.0243			0.0000			0.0000
Off-Road	0.1873	1.8958	2.2602	3.1100e-003		0.1118	0.1118		0.1028	0.1028		300.9001	300.9001	0.0973		303.3330
Total	**0.1873**	**1.8958**	**2.2602**	**3.1100e-003**	**0.1602**	**0.1118**	**0.2720**	**0.0243**	**0.1028**	**0.1271**		**300.9001**	**300.9001**	**0.0973**		**303.3330**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5005	21.2660	2.8462	0.0778	6.1821	0.0660	6.2481	1.5683	0.0632	1.6314		8,154.4216	8,154.4216	0.3066		8,162.0860
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0194	0.0118	0.1397	1.7000e-004	0.0648	1.1000e-004	0.0649	0.0162	1.0000e-004	0.0163		16.4014	16.4014	1.3200e-003		16.4344
Total	**0.5199**	**21.2778**	**2.9858**	**0.0779**	**6.2469**	**0.0661**	**6.3131**	**1.5845**	**0.0633**	**1.6478**		**8,170.8230**	**8,170.8230**	**0.3079**		**8,178.5204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1602	0.0000	0.1602	0.0243	0.0000	0.0243			0.0000			0.0000
Off-Road	0.1873	1.8958	2.2602	3.1100e-003		0.1118	0.1118		0.1028	0.1028	0.0000	300.9001	300.9001	0.0973		303.3330
Total	**0.1873**	**1.8958**	**2.2602**	**3.1100e-003**	**0.1602**	**0.1118**	**0.2720**	**0.0243**	**0.1028**	**0.1271**	**0.0000**	**300.9001**	**300.9001**	**0.0973**		**303.3330**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5005	21.2660	2.8462	0.0778	6.1821	0.0660	6.2481	1.5683	0.0632	1.6314		8,154.4216	8,154.4216	0.3066		8,162.0860
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0194	0.0118	0.1397	1.7000e-004	0.0648	1.1000e-004	0.0649	0.0162	1.0000e-004	0.0163		16.4014	16.4014	1.3200e-003		16.4344
Total	**0.5199**	**21.2778**	**2.9858**	**0.0779**	**6.2469**	**0.0661**	**6.3131**	**1.5845**	**0.0633**	**1.6478**		**8,170.8230**	**8,170.8230**	**0.3079**		**8,178.5204**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9630	0.0000	3.9630	0.4355	0.0000	0.4355			0.0000			0.0000
Off-Road	1.8354	22.5519	10.5391	0.0284		0.7918	0.7918		0.7284	0.7284		2,751.2798	2,751.2798	0.8898		2,773.5252
Total	**1.8354**	**22.5519**	**10.5391**	**0.0284**	**3.9630**	**0.7918**	**4.7547**	**0.4355**	**0.7284**	**1.1640**		**2,751.2798**	**2,751.2798**	**0.8898**		**2,773.5252**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5482	23.2913	3.1173	0.0852	6.7709	0.0723	6.8432	1.7177	0.0692	1.7868		8,931.033 2	8,931.033 2	0.3358		8,939.427 5
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0518	0.0315	0.3724	4.4000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		43.7370	43.7370	3.5200e-003		43.8250
Total	**0.6000**	**23.3228**	**3.4897**	**0.0856**	**6.9437**	**0.0726**	**7.0163**	**1.7610**	**0.0694**	**1.8304**		**8,974.770 2**	**8,974.770 2**	**0.3393**		**8,983.252 6**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9630	0.0000	3.9630	0.4355	0.0000	0.4355			0.0000			0.0000
Off-Road	1.8354	22.5519	10.5391	0.0284		0.7918	0.7918		0.7284	0.7284	0.0000	2,751.279 7	2,751.279 7	0.8898		2,773.525 2
Total	**1.8354**	**22.5519**	**10.5391**	**0.0284**	**3.9630**	**0.7918**	**4.7547**	**0.4355**	**0.7284**	**1.1640**	**0.0000**	**2,751.279 7**	**2,751.279 7**	**0.8898**		**2,773.525 2**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5482	23.2913	3.1173	0.0852	6.7709	0.0723	6.8432	1.7177	0.0692	1.7868		8,931.0332	8,931.0332	0.3358		8,939.4275
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0518	0.0315	0.3724	4.4000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		43.7370	43.7370	3.5200e-003		43.8250
Total	**0.6000**	**23.3228**	**3.4897**	**0.0856**	**6.9437**	**0.0726**	**7.0163**	**1.7610**	**0.0694**	**1.8304**		**8,974.7702**	**8,974.7702**	**0.3393**		**8,983.2526**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6757	6.3500	5.7519	7.6200e-003		0.4365	0.4365		0.4016	0.4016		738.2409	738.2409	0.2388		744.2100
Total	**0.6757**	**6.3500**	**5.7519**	**7.6200e-003**		**0.4365**	**0.4365**		**0.4016**	**0.4016**		**738.2409**	**738.2409**	**0.2388**		**744.2100**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1721	4.5055	1.2098	0.0142	1.2244	0.0115	1.2358	0.3160	0.0110	0.3269		1,487.6349	1,487.6349	0.0736		1,489.4746
Worker	1.2558	0.7640	9.0310	0.0107	4.1914	7.0700e-003	4.1984	1.0502	6.5200e-003	1.0567		1,060.6225	1,060.6225	0.0854		1,062.7572
Total	**1.4279**	**5.2694**	**10.2408**	**0.0250**	**5.4158**	**0.0185**	**5.4343**	**1.3662**	**0.0175**	**1.3836**		**2,548.2574**	**2,548.2574**	**0.1590**		**2,552.2318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6757	6.3500	5.7519	7.6200e-003		0.4365	0.4365		0.4016	0.4016	0.0000	738.2409	738.2409	0.2388		744.2100
Total	**0.6757**	**6.3500**	**5.7519**	**7.6200e-003**		**0.4365**	**0.4365**		**0.4016**	**0.4016**	**0.0000**	**738.2409**	**738.2409**	**0.2388**		**744.2100**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1721	4.5055	1.2098	0.0142	1.2244	0.0115	1.2358	0.3160	0.0110	0.3269		1,487.6349	1,487.6349	0.0736		1,489.4746
Worker	1.2558	0.7640	9.0310	0.0107	4.1914	7.0700e-003	4.1984	1.0502	6.5200e-003	1.0567		1,060.6225	1,060.6225	0.0854		1,062.7572
Total	**1.4279**	**5.2694**	**10.2408**	**0.0250**	**5.4158**	**0.0185**	**5.4343**	**1.3662**	**0.0175**	**1.3836**		**2,548.2574**	**2,548.2574**	**0.1590**		**2,552.2318**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6216	5.9008	5.7109	7.6200e-003		0.3882	0.3882		0.3571	0.3571		738.5643	738.5643	0.2389		744.5360
Total	**0.6216**	**5.9008**	**5.7109**	**7.6200e-003**		**0.3882**	**0.3882**		**0.3571**	**0.3571**		**738.5643**	**738.5643**	**0.2389**		**744.5360**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1594	4.2279	1.1001	0.0141	1.2244	9.7100e-003	1.2341	0.3160	9.2800e-003	0.3252		1,476.4977	1,476.4977	0.0695		1,478.2356
Worker	1.1703	0.7010	8.2719	0.0103	4.1914	6.7600e-003	4.1981	1.0502	6.2300e-003	1.0564		1,021.9379	1,021.9379	0.0780		1,023.8869
Total	**1.3298**	**4.9289**	**9.3720**	**0.0245**	**5.4158**	**0.0165**	**5.4322**	**1.3662**	**0.0155**	**1.3817**		**2,498.4356**	**2,498.4356**	**0.1475**		**2,502.1225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6216	5.9008	5.7109	7.6200e-003		0.3882	0.3882		0.3571	0.3571	0.0000	738.5643	738.5643	0.2389		744.5360
Total	**0.6216**	**5.9008**	**5.7109**	**7.6200e-003**		**0.3882**	**0.3882**		**0.3571**	**0.3571**	**0.0000**	**738.5643**	**738.5643**	**0.2389**		**744.5360**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1594	4.2279	1.1001	0.0141	1.2244	9.7100e-003	1.2341	0.3160	9.2800e-003	0.3252		1,476.4977	1,476.4977	0.0695		1,478.2356
Worker	1.1703	0.7010	8.2719	0.0103	4.1914	6.7600e-003	4.1981	1.0502	6.2300e-003	1.0564		1,021.9379	1,021.9379	0.0780		1,023.8869
Total	**1.3298**	**4.9289**	**9.3720**	**0.0245**	**5.4158**	**0.0165**	**5.4322**	**1.3662**	**0.0155**	**1.3817**		**2,498.4356**	**2,498.4356**	**0.1475**		**2,502.1225**

3.5 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**6.8957**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2525	0.1536	1.8155	2.1600e-003	0.8426	1.4200e-003	0.8440	0.2111	1.3100e-003	0.2124		213.2179	213.2179	0.0172		213.6471
Total	**0.2525**	**0.1536**	**1.8155**	**2.1600e-003**	**0.8426**	**1.4200e-003**	**0.8440**	**0.2111**	**1.3100e-003**	**0.2124**		**213.2179**	**213.2179**	**0.0172**		**213.6471**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**6.8957**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2525	0.1536	1.8155	2.1600e-003	0.8426	1.4200e-003	0.8440	0.2111	1.3100e-003	0.2124		213.2179	213.2179	0.0172		213.6471
Total	**0.2525**	**0.1536**	**1.8155**	**2.1600e-003**	**0.8426**	**1.4200e-003**	**0.8440**	**0.2111**	**1.3100e-003**	**0.2124**		**213.2179**	**213.2179**	**0.0172**		**213.6471**

3.5 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**6.8813**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.5 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2353	0.1409	1.6629	2.0800e-003	0.8426	1.3600e-003	0.8440	0.2111	1.2500e-003	0.2124		205.4411	205.4411	0.0157		205.8329
Total	**0.2353**	**0.1409**	**1.6629**	**2.0800e-003**	**0.8426**	**1.3600e-003**	**0.8440**	**0.2111**	**1.2500e-003**	**0.2124**		**205.4411**	**205.4411**	**0.0157**		**205.8329**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**6.8813**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.5 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2353	0.1409	1.6629	2.0800e-003	0.8426	1.3600e-003	0.8440	0.2111	1.2500e-003	0.2124		205.4411	205.4411	0.0157		205.8329
Total	**0.2353**	**0.1409**	**1.6629**	**2.0800e-003**	**0.8426**	**1.3600e-003**	**0.8440**	**0.2111**	**1.2500e-003**	**0.2124**		**205.4411**	**205.4411**	**0.0157**		**205.8329**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6252	6.4435	6.6657	9.9500e-003		0.3607	0.3607		0.3318	0.3318		963.2386	963.2386	0.3115		971.0269
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7307**	**6.4435**	**6.6657**	**9.9500e-003**		**0.3607**	**0.3607**		**0.3318**	**0.3318**		**963.2386**	**963.2386**	**0.3115**		**971.0269**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0518	0.0315	0.3724	4.4000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		43.7370	43.7370	3.5200e-003		43.8250
Total	**0.0518**	**0.0315**	**0.3724**	**4.4000e-004**	**0.1728**	**2.9000e-004**	**0.1731**	**0.0433**	**2.7000e-004**	**0.0436**		**43.7370**	**43.7370**	**3.5200e-003**		**43.8250**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6252	6.4435	6.6657	9.9500e-003		0.3607	0.3607		0.3318	0.3318	0.0000	963.2386	963.2386	0.3115		971.0269
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7307**	**6.4435**	**6.6657**	**9.9500e-003**		**0.3607**	**0.3607**		**0.3318**	**0.3318**	**0.0000**	**963.2386**	**963.2386**	**0.3115**		**971.0269**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0518	0.0315	0.3724	4.4000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		43.7370	43.7370	3.5200e-003		43.8250
Total	**0.0518**	**0.0315**	**0.3724**	**4.4000e-004**	**0.1728**	**2.9000e-004**	**0.1731**	**0.0433**	**2.7000e-004**	**0.0436**		**43.7370**	**43.7370**	**3.5200e-003**		**43.8250**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5395	5.5507	6.6046	9.9500e-003		0.2987	0.2987		0.2748	0.2748		963.4656	963.4656	0.3116		971.2557
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6449**	**5.5507**	**6.6046**	**9.9500e-003**		**0.2987**	**0.2987**		**0.2748**	**0.2748**		**963.4656**	**963.4656**	**0.3116**		**971.2557**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0483	0.0289	0.3411	4.3000e-004	0.1728	2.8000e-004	0.1731	0.0433	2.6000e-004	0.0436		42.1418	42.1418	3.2100e-003		42.2221
Total	**0.0483**	**0.0289**	**0.3411**	**4.3000e-004**	**0.1728**	**2.8000e-004**	**0.1731**	**0.0433**	**2.6000e-004**	**0.0436**		**42.1418**	**42.1418**	**3.2100e-003**		**42.2221**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5395	5.5507	6.6046	9.9500e-003		0.2987	0.2987		0.2748	0.2748	0.0000	963.4656	963.4656	0.3116		971.2557
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6449**	**5.5507**	**6.6046**	**9.9500e-003**		**0.2987**	**0.2987**		**0.2748**	**0.2748**	**0.0000**	**963.4656**	**963.4656**	**0.3116**		**971.2557**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0483	0.0289	0.3411	4.3000e-004	0.1728	2.8000e-004	0.1731	0.0433	2.6000e-004	0.0436		42.1418	42.1418	3.2100e-003		42.2221
Total	**0.0483**	**0.0289**	**0.3411**	**4.3000e-004**	**0.1728**	**2.8000e-004**	**0.1731**	**0.0433**	**2.6000e-004**	**0.0436**		**42.1418**	**42.1418**	**3.2100e-003**		**42.2221**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	3.4883	19.2931	28.1444	0.0723	12.7153	0.0301	12.7454	3.1968	0.0282	3.2250		7,400.678 8	7,400.678 8	0.5630		7,414.754 1
Unmitigated	3.7342	20.5361	35.2109	0.0909	18.1647	0.0395	18.2043	4.5669	0.0370	4.6039		9,295.703 7	9,295.703 7	0.6459		9,311.851 7

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,323.00	1,323.00	1323.00	2,217,745	1,552,422
Parking Lot	0.00	0.00	0.00		
Total	1,323.00	1,323.00	1,323.00	2,217,745	1,552,422

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	7.30	3.90	3.70	40.20	19.20	40.60	86	11	3
Parking Lot	6.70	5.00	8.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Parking Lot	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
NaturalGas Unmitigated	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7680.58	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0828**	**0.7078**	**0.3012**	**4.5200e-003**		**0.0572**	**0.0572**		**0.0572**	**0.0572**		**903.5971**	**903.5971**	**0.0173**	**0.0166**	**908.9667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.68058	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0828**	**0.7078**	**0.3012**	**4.5200e-003**		**0.0572**	**0.0572**		**0.0572**	**0.0572**		**903.5971**	**903.5971**	**0.0173**	**0.0166**	**908.9667**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720
Unmitigated	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.6348					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9066					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4511	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824		26.8237	26.8237	0.0259		27.4720
Total	**4.9924**	**0.1716**	**14.8928**	**7.9000e-004**		**0.0824**	**0.0824**		**0.0824**	**0.0824**	**0.0000**	**26.8237**	**26.8237**	**0.0259**	**0.0000**	**27.4720**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.6348					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9066					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4511	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824		26.8237	26.8237	0.0259		27.4720
Total	**4.9924**	**0.1716**	**14.8928**	**7.9000e-004**		**0.0824**	**0.0824**		**0.0824**	**0.0824**	**0.0000**	**26.8237**	**26.8237**	**0.0259**	**0.0000**	**27.4720**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

El Centro Town Center

Imperial County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	385.00	Space	3.46	154,000.00	0
Apartments Low Rise	180.00	Dwelling Unit	8.10	180,000.00	581

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage updated to match project site plan

Construction Phase - Building contrtuction, paving and architectural coating will be conducted at the same time

Off-road Equipment -

Off-road Equipment - information supplied by applicant

Off-road Equipment - Information supplied by applicant

Off-road Equipment - information supplied by applicant

Off-road Equipment - Information provided by applicant

On-road Fugitive Dust - location surrounded by paved roads

Grading - Import/Export material information obtained from construction questionnaire

Vehicle Trips - Updated to match traffic report. ADT= 1320

Road Dust - site location surrounded by paved roadways

Woodstoves - Assumed no fireplaces or wood stoves based on project type and location

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	40
tblConstructionPhase	NumDays	20.00	347.00
tblConstructionPhase	NumDays	300.00	347.00
tblConstructionPhase	NumDays	30.00	21.00
tblConstructionPhase	NumDays	20.00	86.00
tblConstructionPhase	NumDays	10.00	23.00
tblFireplaces	FireplaceWoodMass	2,080.00	0.00
tblFireplaces	NumberGas	99.00	0.00

tblGrading	AcresOfGrading	42.00	75.00
tblGrading	MaterialExported	0.00	7,000.00
tblGrading	MaterialExported	0.00	7,000.00
tblGrading	MaterialImported	0.00	11,500.00
tblGrading	MaterialImported	0.00	11,500.00
tblLandUse	LotAcreage	11.25	8.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	RoadSiltLoading	0.10	0.50

tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	RoadSiltLoading	0.10	0.50
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblRoadDust	RoadPercentPave	50	100
tblRoadDust	RoadSiltLoading	0.1	0.5
tblTripsAndVMT	HaulingTripNumber	2,313.00	2,312.00
tblTripsAndVMT	HaulingTripNumber	2,313.00	2,312.00
tblVehicleTrips	ST_TR	7.16	7.35
tblVehicleTrips	SU_TR	6.07	7.35
tblVehicleTrips	WD_TR	6.59	7.35

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	9.7397	46.4750	24.0834	0.1114	10.9067	0.9119	11.7727	2.1965	0.8469	2.9959	0.0000	11,456.5733	11,456.5733	1.2698	0.0000	11,488.3170
2022	9.4920	18.0351	23.1381	0.0449	6.4312	0.7870	7.2182	1.6206	0.7310	2.3516	0.0000	4,471.2390	4,471.2390	0.7253	0.0000	4,489.3718
Maximum	**9.7397**	**46.4750**	**24.0834**	**0.1114**	**10.9067**	**0.9119**	**11.7727**	**2.1965**	**0.8469**	**2.9959**	**0.0000**	**11,456.5733**	**11,456.5733**	**1.2698**	**0.0000**	**11,488.3170**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	9.7397	46.4750	24.0834	0.1114	10.9067	0.9119	11.7727	2.1965	0.8469	2.9959	0.0000	11,456.5733	11,456.5733	1.2698	0.0000	11,488.3169
2022	9.4920	18.0351	23.1381	0.0449	6.4312	0.7870	7.2182	1.6206	0.7310	2.3516	0.0000	4,471.2390	4,471.2390	0.7253	0.0000	4,489.3718
Maximum	**9.7397**	**46.4750**	**24.0834**	**0.1114**	**10.9067**	**0.9119**	**11.7727**	**2.1965**	**0.8469**	**2.9959**	**0.0000**	**11,456.5733**	**11,456.5733**	**1.2698**	**0.0000**	**11,488.3169**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720
Energy	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Mobile	2.8032	20.3214	29.5159	0.0814	18.1647	0.0405	18.2052	4.5669	0.0379	4.6048		8,333.8281	8,333.8281	0.6447		8,349.9448
Total	**7.8785**	**21.2008**	**44.7099**	**0.0867**	**18.1647**	**0.1800**	**18.3448**	**4.5669**	**0.1775**	**4.7444**	**0.0000**	**9,264.2489**	**9,264.2489**	**0.6879**	**0.0166**	**9,286.3836**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720
Energy	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Mobile	2.6002	18.9730	24.7971	0.0645	12.7153	0.0310	12.7463	3.1968	0.0290	3.2259		6,614.8825	6,614.8825	0.5792		6,629.3616
Total	**7.6755**	**19.8524**	**39.9912**	**0.0698**	**12.7153**	**0.1706**	**12.8859**	**3.1968**	**0.1686**	**3.3655**	**0.0000**	**7,545.3033**	**7,545.3033**	**0.6224**	**0.0166**	**7,565.8004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	2.58	6.36	10.55	19.48	30.00	5.24	29.76	30.00	4.99	29.06	0.00	18.55	18.55	9.52	0.00	18.53

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2021	3/31/2021	5	23	
2	Grading	Grading	4/1/2021	4/29/2021	5	21	
3	Building Construction	Building Construction	5/1/2021	8/30/2022	5	347	
4	Architectural Coating	Architectural Coating	5/1/2021	8/30/2022	5	347	
5	Paving	Paving	12/1/2021	3/30/2022	5	86	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 3.46

Residential Indoor: 364,500; Residential Outdoor: 121,500; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,240 (Architectural Coating – sqft)

OffRoad Equipment

El Centro Town Center - Imperial County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	0	8.00	158	0.38
Grading	Graders	2	8.00	187	0.41
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Trenchers	1	8.00	78	0.50
Building Construction	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	3.00	0.00	2,312.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	2,312.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	194.00	44.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	39.00	0.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1602	0.0000	0.1602	0.0243	0.0000	0.0243			0.0000			0.0000
Off-Road	0.1873	1.8958	2.2602	3.1100e-003		0.1118	0.1118		0.1028	0.1028		300.9001	300.9001	0.0973		303.3330
Total	**0.1873**	**1.8958**	**2.2602**	**3.1100e-003**	**0.1602**	**0.1118**	**0.2720**	**0.0243**	**0.1028**	**0.1271**		**300.9001**	**300.9001**	**0.0973**		**303.3330**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5315	21.8127	3.4214	0.0755	6.1821	0.0675	6.2496	1.5683	0.0646	1.6329		7,914.8200	7,914.8200	0.3443		7,923.4273
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0157	0.0124	0.1053	1.4000e-004	0.0648	1.1000e-004	0.0649	0.0162	1.0000e-004	0.0163		13.7554	13.7554	1.0700e-003		13.7821
Total	**0.5471**	**21.8250**	**3.5266**	**0.0756**	**6.2469**	**0.0676**	**6.3145**	**1.5845**	**0.0647**	**1.6492**		**7,928.5754**	**7,928.5754**	**0.3454**		**7,937.2094**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1602	0.0000	0.1602	0.0243	0.0000	0.0243			0.0000			0.0000
Off-Road	0.1873	1.8958	2.2602	3.1100e-003		0.1118	0.1118		0.1028	0.1028	0.0000	300.9001	300.9001	0.0973		303.3330
Total	**0.1873**	**1.8958**	**2.2602**	**3.1100e-003**	**0.1602**	**0.1118**	**0.2720**	**0.0243**	**0.1028**	**0.1271**	**0.0000**	**300.9001**	**300.9001**	**0.0973**		**303.3330**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5315	21.8127	3.4214	0.0755	6.1821	0.0675	6.2496	1.5683	0.0646	1.6329		7,914.820 0	7,914.820 0	0.3443		7,923.427 3
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0157	0.0124	0.1053	1.4000e-004	0.0648	1.1000e-004	0.0649	0.0162	1.0000e-004	0.0163		13.7554	13.7554	1.0700e-003		13.7821
Total	**0.5471**	**21.8250**	**3.5266**	**0.0756**	**6.2469**	**0.0676**	**6.3145**	**1.5845**	**0.0647**	**1.6492**		**7,928.575 4**	**7,928.575 4**	**0.3454**		**7,937.209 4**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9630	0.0000	3.9630	0.4355	0.0000	0.4355			0.0000			0.0000
Off-Road	1.8354	22.5519	10.5391	0.0284		0.7918	0.7918		0.7284	0.7284		2,751.279 8	2,751.279 8	0.8898		2,773.525 2
Total	**1.8354**	**22.5519**	**10.5391**	**0.0284**	**3.9630**	**0.7918**	**4.7547**	**0.4355**	**0.7284**	**1.1640**		**2,751.279 8**	**2,751.279 8**	**0.8898**		**2,773.525 2**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5821	23.8901	3.7472	0.0827	6.7709	0.0739	6.8448	1.7177	0.0707	1.7884		8,668.612 4	8,668.612 4	0.3771		8,678.039 4
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0418	0.0330	0.2807	3.7000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		36.6811	36.6811	2.8500e-003		36.7523
Total	**0.6239**	**23.9231**	**4.0280**	**0.0830**	**6.9437**	**0.0742**	**7.0180**	**1.7610**	**0.0710**	**1.8320**		**8,705.293 5**	**8,705.293 5**	**0.3799**		**8,714.791 7**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9630	0.0000	3.9630	0.4355	0.0000	0.4355			0.0000			0.0000
Off-Road	1.8354	22.5519	10.5391	0.0284		0.7918	0.7918		0.7284	0.7284	0.0000	2,751.279 7	2,751.279 7	0.8898		2,773.525 2
Total	**1.8354**	**22.5519**	**10.5391**	**0.0284**	**3.9630**	**0.7918**	**4.7547**	**0.4355**	**0.7284**	**1.1640**	**0.0000**	**2,751.279 7**	**2,751.279 7**	**0.8898**		**2,773.525 2**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.5821	23.8901	3.7472	0.0827	6.7709	0.0739	6.8448	1.7177	0.0707	1.7884		8,668.6124	8,668.6124	0.3771		8,678.0394
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0418	0.0330	0.2807	3.7000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		36.6811	36.6811	2.8500e-003		36.7523
Total	**0.6239**	**23.9231**	**4.0280**	**0.0830**	**6.9437**	**0.0742**	**7.0180**	**1.7610**	**0.0710**	**1.8320**		**8,705.2935**	**8,705.2935**	**0.3799**		**8,714.7917**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6757	6.3500	5.7519	7.6200e-003		0.4365	0.4365		0.4016	0.4016		738.2409	738.2409	0.2388		744.2100
Total	**0.6757**	**6.3500**	**5.7519**	**7.6200e-003**		**0.4365**	**0.4365**		**0.4016**	**0.4016**		**738.2409**	**738.2409**	**0.2388**		**744.2100**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1788	4.5602	1.3915	0.0137	1.2244	0.0118	1.2362	0.3160	0.0113	0.3273		1,434.2372	1,434.2372	0.0822		1,436.2912
Worker	1.0134	0.8002	6.8076	9.0000e-003	4.1914	7.0700e-003	4.1984	1.0502	6.5200e-003	1.0567		889.5175	889.5175	0.0691		891.2441
Total	**1.1922**	**5.3604**	**8.1991**	**0.0227**	**5.4158**	**0.0189**	**5.4347**	**1.3662**	**0.0178**	**1.3840**		**2,323.7548**	**2,323.7548**	**0.1512**		**2,327.5354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6757	6.3500	5.7519	7.6200e-003		0.4365	0.4365		0.4016	0.4016	0.0000	738.2409	738.2409	0.2388		744.2100
Total	**0.6757**	**6.3500**	**5.7519**	**7.6200e-003**		**0.4365**	**0.4365**		**0.4016**	**0.4016**	**0.0000**	**738.2409**	**738.2409**	**0.2388**		**744.2100**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1788	4.5602	1.3915	0.0137	1.2244	0.0118	1.2362	0.3160	0.0113	0.3273		1,434.2372	1,434.2372	0.0822		1,436.2912
Worker	1.0134	0.8002	6.8076	9.0000e-003	4.1914	7.0700e-003	4.1984	1.0502	6.5200e-003	1.0567		889.5175	889.5175	0.0691		891.2441
Total	**1.1922**	**5.3604**	**8.1991**	**0.0227**	**5.4158**	**0.0189**	**5.4347**	**1.3662**	**0.0178**	**1.3840**		**2,323.7548**	**2,323.7548**	**0.1512**		**2,327.5354**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6216	5.9008	5.7109	7.6200e-003		0.3882	0.3882		0.3571	0.3571		738.5643	738.5643	0.2389		744.5360
Total	**0.6216**	**5.9008**	**5.7109**	**7.6200e-003**		**0.3882**	**0.3882**		**0.3571**	**0.3571**		**738.5643**	**738.5643**	**0.2389**		**744.5360**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1660	4.2645	1.2731	0.0136	1.2244	0.0101	1.2345	0.3160	9.6200e-003	0.3256		1,423.0389	1,423.0389	0.0778		1,424.9849
Worker	0.9484	0.7330	6.2273	8.6600e-003	4.1914	6.7600e-003	4.1981	1.0502	6.2300e-003	1.0564		857.0793	857.0793	0.0633		858.6626
Total	**1.1145**	**4.9976**	**7.5003**	**0.0223**	**5.4158**	**0.0168**	**5.4326**	**1.3662**	**0.0159**	**1.3820**		**2,280.1182**	**2,280.1182**	**0.1412**		**2,283.6475**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6216	5.9008	5.7109	7.6200e-003		0.3882	0.3882		0.3571	0.3571	0.0000	738.5643	738.5643	0.2389		744.5360
Total	**0.6216**	**5.9008**	**5.7109**	**7.6200e-003**		**0.3882**	**0.3882**		**0.3571**	**0.3571**	**0.0000**	**738.5643**	**738.5643**	**0.2389**		**744.5360**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1660	4.2645	1.2731	0.0136	1.2244	0.0101	1.2345	0.3160	9.6200e-003	0.3256		1,423.0389	1,423.0389	0.0778		1,424.9849
Worker	0.9484	0.7330	6.2273	8.6600e-003	4.1914	6.7600e-003	4.1981	1.0502	6.2300e-003	1.0564		857.0793	857.0793	0.0633		858.6626
Total	**1.1145**	**4.9976**	**7.5003**	**0.0223**	**5.4158**	**0.0168**	**5.4326**	**1.3662**	**0.0159**	**1.3820**		**2,280.1182**	**2,280.1182**	**0.1412**		**2,283.6475**

3.5 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**6.8957**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2037	0.1609	1.3685	1.8100e-003	0.8426	1.4200e-003	0.8440	0.2111	1.3100e-003	0.2124		178.8205	178.8205	0.0139		179.1676
Total	**0.2037**	**0.1609**	**1.3685**	**1.8100e-003**	**0.8426**	**1.4200e-003**	**0.8440**	**0.2111**	**1.3100e-003**	**0.2124**		**178.8205**	**178.8205**	**0.0139**		**179.1676**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**6.8957**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.5 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2037	0.1609	1.3685	1.8100e-003	0.8426	1.4200e-003	0.8440	0.2111	1.3100e-003	0.2124		178.8205	178.8205	0.0139		179.1676
Total	**0.2037**	**0.1609**	**1.3685**	**1.8100e-003**	**0.8426**	**1.4200e-003**	**0.8440**	**0.2111**	**1.3100e-003**	**0.2124**		**178.8205**	**178.8205**	**0.0139**		**179.1676**

3.5 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**6.8813**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.5 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1907	0.1474	1.2519	1.7400e-003	0.8426	1.3600e-003	0.8440	0.2111	1.2500e-003	0.2124		172.2994	172.2994	0.0127		172.6177
Total	**0.1907**	**0.1474**	**1.2519**	**1.7400e-003**	**0.8426**	**1.3600e-003**	**0.8440**	**0.2111**	**1.2500e-003**	**0.2124**		**172.2994**	**172.2994**	**0.0127**		**172.6177**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	6.6768					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**6.8813**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

3.5 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1907	0.1474	1.2519	1.7400e-003	0.8426	1.3600e-003	0.8440	0.2111	1.2500e-003	0.2124		172.2994	172.2994	0.0127		172.6177
Total	**0.1907**	**0.1474**	**1.2519**	**1.7400e-003**	**0.8426**	**1.3600e-003**	**0.8440**	**0.2111**	**1.2500e-003**	**0.2124**		**172.2994**	**172.2994**	**0.0127**		**172.6177**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6252	6.4435	6.6657	9.9500e-003		0.3607	0.3607		0.3318	0.3318		963.2386	963.2386	0.3115		971.0269
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7307**	**6.4435**	**6.6657**	**9.9500e-003**		**0.3607**	**0.3607**		**0.3318**	**0.3318**		**963.2386**	**963.2386**	**0.3115**		**971.0269**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0418	0.0330	0.2807	3.7000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		36.6811	36.6811	2.8500e-003		36.7523
Total	**0.0418**	**0.0330**	**0.2807**	**3.7000e-004**	**0.1728**	**2.9000e-004**	**0.1731**	**0.0433**	**2.7000e-004**	**0.0436**		**36.6811**	**36.6811**	**2.8500e-003**		**36.7523**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6252	6.4435	6.6657	9.9500e-003		0.3607	0.3607		0.3318	0.3318	0.0000	963.2386	963.2386	0.3115		971.0269
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.7307**	**6.4435**	**6.6657**	**9.9500e-003**		**0.3607**	**0.3607**		**0.3318**	**0.3318**	**0.0000**	**963.2386**	**963.2386**	**0.3115**		**971.0269**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0418	0.0330	0.2807	3.7000e-004	0.1728	2.9000e-004	0.1731	0.0433	2.7000e-004	0.0436		36.6811	36.6811	2.8500e-003		36.7523
Total	**0.0418**	**0.0330**	**0.2807**	**3.7000e-004**	**0.1728**	**2.9000e-004**	**0.1731**	**0.0433**	**2.7000e-004**	**0.0436**		**36.6811**	**36.6811**	**2.8500e-003**		**36.7523**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5395	5.5507	6.6046	9.9500e-003		0.2987	0.2987		0.2748	0.2748		963.4656	963.4656	0.3116		971.2557
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6449**	**5.5507**	**6.6046**	**9.9500e-003**		**0.2987**	**0.2987**		**0.2748**	**0.2748**		**963.4656**	**963.4656**	**0.3116**		**971.2557**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0391	0.0302	0.2568	3.6000e-004	0.1728	2.8000e-004	0.1731	0.0433	2.6000e-004	0.0436		35.3435	35.3435	2.6100e-003		35.4088
Total	**0.0391**	**0.0302**	**0.2568**	**3.6000e-004**	**0.1728**	**2.8000e-004**	**0.1731**	**0.0433**	**2.6000e-004**	**0.0436**		**35.3435**	**35.3435**	**2.6100e-003**		**35.4088**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5395	5.5507	6.6046	9.9500e-003		0.2987	0.2987		0.2748	0.2748	0.0000	963.4656	963.4656	0.3116		971.2557
Paving	0.1054					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.6449**	**5.5507**	**6.6046**	**9.9500e-003**		**0.2987**	**0.2987**		**0.2748**	**0.2748**	**0.0000**	**963.4656**	**963.4656**	**0.3116**		**971.2557**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0391	0.0302	0.2568	3.6000e-004	0.1728	2.8000e-004	0.1731	0.0433	2.6000e-004	0.0436		35.3435	35.3435	2.6100e-003		35.4088
Total	**0.0391**	**0.0302**	**0.2568**	**3.6000e-004**	**0.1728**	**2.8000e-004**	**0.1731**	**0.0433**	**2.6000e-004**	**0.0436**		**35.3435**	**35.3435**	**2.6100e-003**		**35.4088**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.6002	18.9730	24.7971	0.0645	12.7153	0.0310	12.7463	3.1968	0.0290	3.2259		6,614.8825	6,614.8825	0.5792		6,629.3616
Unmitigated	2.8032	20.3214	29.5159	0.0814	18.1647	0.0405	18.2052	4.5669	0.0379	4.6048		8,333.8281	8,333.8281	0.6447		8,349.9448

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,323.00	1,323.00	1323.00	2,217,745	1,552,422
Parking Lot	0.00	0.00	0.00		
Total	1,323.00	1,323.00	1,323.00	2,217,745	1,552,422

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	7.30	3.90	3.70	40.20	19.20	40.60	86	11	3
Parking Lot	6.70	5.00	8.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Parking Lot	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
NaturalGas Unmitigated	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7680.58	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0828**	**0.7078**	**0.3012**	**4.5200e-003**		**0.0572**	**0.0572**		**0.0572**	**0.0572**		**903.5971**	**903.5971**	**0.0173**	**0.0166**	**908.9667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	7.68058	0.0828	0.7078	0.3012	4.5200e-003		0.0572	0.0572		0.0572	0.0572		903.5971	903.5971	0.0173	0.0166	908.9667
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0828**	**0.7078**	**0.3012**	**4.5200e-003**		**0.0572**	**0.0572**		**0.0572**	**0.0572**		**903.5971**	**903.5971**	**0.0173**	**0.0166**	**908.9667**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720
Unmitigated	4.9924	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824	0.0000	26.8237	26.8237	0.0259	0.0000	27.4720

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.6348					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9066					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4511	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824		26.8237	26.8237	0.0259		27.4720
Total	**4.9924**	**0.1716**	**14.8928**	**7.9000e-004**		**0.0824**	**0.0824**		**0.0824**	**0.0824**	**0.0000**	**26.8237**	**26.8237**	**0.0259**	**0.0000**	**27.4720**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.6348					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.9066					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4511	0.1716	14.8928	7.9000e-004		0.0824	0.0824		0.0824	0.0824		26.8237	26.8237	0.0259		27.4720
Total	**4.9924**	**0.1716**	**14.8928**	**7.9000e-004**		**0.0824**	**0.0824**		**0.0824**	**0.0824**	**0.0000**	**26.8237**	**26.8237**	**0.0259**	**0.0000**	**27.4720**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

El Centro Town Center

Imperial County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	385.00	Space	3.46	154,000.00	0
Apartments Low Rise	180.00	Dwelling Unit	8.10	180,000.00	581

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	12
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage updated to match project site plan

Construction Phase - Building contrtuction, paving and architectural coating will be conducted at the same time

Off-road Equipment -

Off-road Equipment - information supplied by applicant

Off-road Equipment - Information supplied by applicant

Off-road Equipment - information supplied by applicant

Off-road Equipment - Information provided by applicant

On-road Fugitive Dust - location surrounded by paved roads

Grading - Import/Export material information obtained from construction questionnaire

Road Dust - site location surrounded by paved roadways

Woodstoves - Assumed no fireplaces or wood stoves based on project type and location

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Vehicle Trips - Updated to match traffic report. ADT= 1320

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	0.5
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	40
tblConstructionPhase	NumDays	20.00	347.00
tblConstructionPhase	NumDays	300.00	347.00
tblConstructionPhase	NumDays	30.00	21.00
tblConstructionPhase	NumDays	20.00	86.00
tblConstructionPhase	NumDays	10.00	23.00
tblFireplaces	FireplaceWoodMass	2,080.00	0.00
tblFireplaces	NumberGas	99.00	0.00

tblGrading	AcresOfGrading	42.00	75.00
tblGrading	MaterialExported	0.00	7,000.00
tblGrading	MaterialExported	0.00	7,000.00
tblGrading	MaterialImported	0.00	11,500.00
tblGrading	MaterialImported	0.00	11,500.00
tblLandUse	LotAcreage	11.25	8.10
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	HaulingPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00

tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	VendorPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblOnRoadDust	WorkerPercentPave	50.00	100.00
tblRoadDust	RoadPercentPave	50	100
tblTripsAndVMT	HaulingTripNumber	2,313.00	2,312.00
tblTripsAndVMT	HaulingTripNumber	2,313.00	2,312.00
tblVehicleTrips	ST_TR	7.16	7.35
tblVehicleTrips	SU_TR	6.07	7.35
tblVehicleTrips	WD_TR	6.59	7.35

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.8306	2.0144	1.8406	5.4000e-003	0.2290	0.0635	0.2924	0.0552	0.0592	0.1143	0.0000	497.1429	497.1429	0.0532	0.0000	498.4734
2022	0.7819	1.2495	1.6613	3.4000e-003	0.1430	0.0514	0.1944	0.0387	0.0479	0.0865	0.0000	308.3045	308.3045	0.0411	0.0000	309.3324
Maximum	**0.8306**	**2.0144**	**1.8406**	**5.4000e-003**	**0.2290**	**0.0635**	**0.2924**	**0.0552**	**0.0592**	**0.1143**	**0.0000**	**497.1429**	**497.1429**	**0.0532**	**0.0000**	**498.4734**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.8306	2.0144	1.8406	5.4000e-003	0.2290	0.0635	0.2924	0.0552	0.0592	0.1143	0.0000	497.1427	497.1427	0.0532	0.0000	498.4733
2022	0.7819	1.2495	1.6613	3.4000e-003	0.1430	0.0514	0.1944	0.0387	0.0479	0.0865	0.0000	308.3043	308.3043	0.0411	0.0000	309.3323
Maximum	**0.8306**	**2.0144**	**1.8406**	**5.4000e-003**	**0.2290**	**0.0635**	**0.2924**	**0.0552**	**0.0592**	**0.1143**	**0.0000**	**497.1427**	**497.1427**	**0.0532**	**0.0000**	**498.4733**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-13-2021	4-12-2021	0.4778	0.4778
2	4-13-2021	7-12-2021	0.8813	0.8813
3	7-13-2021	10-12-2021	0.7402	0.7402
4	10-13-2021	1-12-2022	0.8372	0.8372
5	1-13-2022	4-12-2022	0.8565	0.8565
6	4-13-2022	7-12-2022	0.6970	0.6970
7	7-13-2022	9-30-2022	0.3753	0.3753
		Highest	0.8813	0.8813

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8694	0.0154	1.3404	7.0000e-005		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	2.1901	2.1901	2.1200e-003	0.0000	2.2430
Energy	0.0151	0.1292	0.0550	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	684.9958	684.9958	0.0151	5.2700e-003	686.9435
Mobile	0.5588	3.7393	5.4988	0.0156	0.8621	7.2600e-003	0.8693	0.2313	6.7900e-003	0.2381	0.0000	1,450.0025	1,450.0025	0.1042	0.0000	1,452.6080
Waste						0.0000	0.0000		0.0000	0.0000	16.8077	0.0000	16.8077	0.9933	0.0000	41.6403
Water						0.0000	0.0000		0.0000	0.0000	3.7207	135.3837	139.1043	0.3852	9.6600e-003	151.6147
Total	**1.4433**	**3.8839**	**6.8941**	**0.0165**	**0.8621**	**0.0251**	**0.8872**	**0.2313**	**0.0246**	**0.2560**	**20.5283**	**2,272.5720**	**2,293.1003**	**1.5000**	**0.0149**	**2,335.0494**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8694	0.0154	1.3404	7.0000e-005		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	2.1901	2.1901	2.1200e-003	0.0000	2.2430
Energy	0.0151	0.1292	0.0550	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	684.9958	684.9958	0.0151	5.2700e-003	686.9435
Mobile	0.5189	3.4964	4.4876	0.0124	0.6035	5.5400e-003	0.6090	0.1619	5.1800e-003	0.1671	0.0000	1,154.5897	1,154.5897	0.0923	0.0000	1,156.8975
Waste						0.0000	0.0000		0.0000	0.0000	16.8077	0.0000	16.8077	0.9933	0.0000	41.6403
Water						0.0000	0.0000		0.0000	0.0000	2.9765	117.7775	120.7540	0.3084	7.7700e-003	130.7810
Total	**1.4034**	**3.6411**	**5.8829**	**0.0133**	**0.6035**	**0.0234**	**0.6269**	**0.1619**	**0.0230**	**0.1850**	**19.7842**	**1,959.5531**	**1,979.3373**	**1.4112**	**0.0130**	**2,018.5052**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.77**	**6.25**	**14.67**	**19.44**	**30.00**	**6.85**	**29.34**	**30.00**	**6.53**	**27.74**	**3.62**	**13.77**	**13.68**	**5.92**	**12.66**	**13.56**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2021	3/31/2021	5	23	
2	Grading	Grading	4/1/2021	4/29/2021	5	21	
3	Building Construction	Building Construction	5/1/2021	8/30/2022	5	347	
4	Architectural Coating	Architectural Coating	5/1/2021	8/30/2022	5	347	
5	Paving	Paving	12/1/2021	3/30/2022	5	86	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 3.46

Residential Indoor: 364,500; Residential Outdoor: 121,500; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 9,240 (Architectural Coating – sqft)

OffRoad Equipment

El Centro Town Center - Imperial County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Excavators	0	8.00	158	0.38
Grading	Graders	2	8.00	187	0.41
Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	0	7.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Trenchers	1	8.00	78	0.50
Building Construction	Welders	0	8.00	46	0.45
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	3.00	0.00	2,312.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	2,312.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	194.00	44.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	39.00	0.00	0.00	7.30	8.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8400e-003	0.0000	1.8400e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1500e-003	0.0218	0.0260	4.0000e-005		1.2900e-003	1.2900e-003		1.1800e-003	1.1800e-003	0.0000	3.1392	3.1392	1.0200e-003	0.0000	3.1646
Total	**2.1500e-003**	**0.0218**	**0.0260**	**4.0000e-005**	**1.8400e-003**	**1.2900e-003**	**3.1300e-003**	**2.8000e-004**	**1.1800e-003**	**1.4600e-003**	**0.0000**	**3.1392**	**3.1392**	**1.0200e-003**	**0.0000**	**3.1646**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.9000e-003	0.2530	0.0355	8.8000e-004	0.0201	7.7000e-004	0.0209	5.5300e-003	7.3000e-004	6.2600e-003	0.0000	84.0222	84.0222	3.3600e-003	0.0000	84.1062
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.4000e-004	1.3100e-003	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1549	0.1549	1.0000e-005	0.0000	0.1552
Total	**6.0900e-003**	**0.2531**	**0.0368**	**8.8000e-004**	**0.0203**	**7.7000e-004**	**0.0211**	**5.5800e-003**	**7.3000e-004**	**6.3100e-003**	**0.0000**	**84.1770**	**84.1770**	**3.3700e-003**	**0.0000**	**84.2613**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.8400e-003	0.0000	1.8400e-003	2.8000e-004	0.0000	2.8000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1500e-003	0.0218	0.0260	4.0000e-005		1.2900e-003	1.2900e-003		1.1800e-003	1.1800e-003	0.0000	3.1392	3.1392	1.0200e-003	0.0000	3.1646
Total	**2.1500e-003**	**0.0218**	**0.0260**	**4.0000e-005**	**1.8400e-003**	**1.2900e-003**	**3.1300e-003**	**2.8000e-004**	**1.1800e-003**	**1.4600e-003**	**0.0000**	**3.1392**	**3.1392**	**1.0200e-003**	**0.0000**	**3.1646**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.9000e-003	0.2530	0.0355	8.8000e-004	0.0201	7.7000e-004	0.0209	5.5300e-003	7.3000e-004	6.2600e-003	0.0000	84.0222	84.0222	3.3600e-003	0.0000	84.1062
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.4000e-004	1.3100e-003	0.0000	1.9000e-004	0.0000	1.9000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1549	0.1549	1.0000e-005	0.0000	0.1552
Total	**6.0900e-003**	**0.2531**	**0.0368**	**8.8000e-004**	**0.0203**	**7.7000e-004**	**0.0211**	**5.5800e-003**	**7.3000e-004**	**6.3100e-003**	**0.0000**	**84.1770**	**84.1770**	**3.3700e-003**	**0.0000**	**84.2613**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0416	0.0000	0.0416	4.5700e-003	0.0000	4.5700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0193	0.2368	0.1107	3.0000e-004		8.3100e-003	8.3100e-003		7.6500e-003	7.6500e-003	0.0000	26.2072	26.2072	8.4800e-003	0.0000	26.4191
Total	**0.0193**	**0.2368**	**0.1107**	**3.0000e-004**	**0.0416**	**8.3100e-003**	**0.0499**	**4.5700e-003**	**7.6500e-003**	**0.0122**	**0.0000**	**26.2072**	**26.2072**	**8.4800e-003**	**0.0000**	**26.4191**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.9000e-003	0.2530	0.0355	8.8000e-004	0.0201	7.7000e-004	0.0209	5.5300e-003	7.3000e-004	6.2600e-003	0.0000	84.0222	84.0222	3.3600e-003	0.0000	84.1062
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.4000e-004	3.1900e-003	0.0000	4.6000e-004	0.0000	4.7000e-004	1.2000e-004	0.0000	1.3000e-004	0.0000	0.3770	0.3770	3.0000e-005	0.0000	0.3778
Total	**6.3500e-003**	**0.2533**	**0.0386**	**8.8000e-004**	**0.0206**	**7.7000e-004**	**0.0214**	**5.6500e-003**	**7.3000e-004**	**6.3900e-003**	**0.0000**	**84.3992**	**84.3992**	**3.3900e-003**	**0.0000**	**84.4839**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0416	0.0000	0.0416	4.5700e-003	0.0000	4.5700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0193	0.2368	0.1107	3.0000e-004		8.3100e-003	8.3100e-003		7.6500e-003	7.6500e-003	0.0000	26.2071	26.2071	8.4800e-003	0.0000	26.4190
Total	**0.0193**	**0.2368**	**0.1107**	**3.0000e-004**	**0.0416**	**8.3100e-003**	**0.0499**	**4.5700e-003**	**7.6500e-003**	**0.0122**	**0.0000**	**26.2071**	**26.2071**	**8.4800e-003**	**0.0000**	**26.4190**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.9000e-003	0.2530	0.0355	8.8000e-004	0.0201	7.7000e-004	0.0209	5.5300e-003	7.3000e-004	6.2600e-003	0.0000	84.0222	84.0222	3.3600e-003	0.0000	84.1062
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	3.4000e-004	3.1900e-003	0.0000	4.6000e-004	0.0000	4.7000e-004	1.2000e-004	0.0000	1.3000e-004	0.0000	0.3770	0.3770	3.0000e-005	0.0000	0.3778
Total	**6.3500e-003**	**0.2533**	**0.0386**	**8.8000e-004**	**0.0206**	**7.7000e-004**	**0.0214**	**5.6500e-003**	**7.3000e-004**	**6.3900e-003**	**0.0000**	**84.3992**	**84.3992**	**3.3900e-003**	**0.0000**	**84.4839**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0591	0.5556	0.5033	6.7000e-004		0.0382	0.0382		0.0351	0.0351	0.0000	58.6006	58.6006	0.0190	0.0000	59.0744
Total	**0.0591**	**0.5556**	**0.5033**	**6.7000e-004**		**0.0382**	**0.0382**		**0.0351**	**0.0351**	**0.0000**	**58.6006**	**58.6006**	**0.0190**	**0.0000**	**59.0744**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0151	0.4028	0.1119	1.2300e-003	0.0316	1.0200e-003	0.0326	9.1100e-003	9.7000e-004	0.0101	0.0000	116.3063	116.3063	6.1200e-003	0.0000	116.4592
Worker	0.0918	0.0689	0.6446	8.5000e-004	0.0936	6.2000e-004	0.0943	0.0249	5.7000e-004	0.0254	0.0000	76.1933	76.1933	5.9000e-003	0.0000	76.3407
Total	**0.1069**	**0.4718**	**0.7565**	**2.0800e-003**	**0.1253**	**1.6400e-003**	**0.1269**	**0.0340**	**1.5400e-003**	**0.0355**	**0.0000**	**192.4995**	**192.4995**	**0.0120**	**0.0000**	**192.7999**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0591	0.5556	0.5033	6.7000e-004		0.0382	0.0382		0.0351	0.0351	0.0000	58.6005	58.6005	0.0190	0.0000	59.0743
Total	**0.0591**	**0.5556**	**0.5033**	**6.7000e-004**		**0.0382**	**0.0382**		**0.0351**	**0.0351**	**0.0000**	**58.6005**	**58.6005**	**0.0190**	**0.0000**	**59.0743**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0151	0.4028	0.1119	1.2300e-003	0.0316	1.0200e-003	0.0326	9.1100e-003	9.7000e-004	0.0101	0.0000	116.3063	116.3063	6.1200e-003	0.0000	116.4592
Worker	0.0918	0.0689	0.6446	8.5000e-004	0.0936	6.2000e-004	0.0943	0.0249	5.7000e-004	0.0254	0.0000	76.1933	76.1933	5.9000e-003	0.0000	76.3407
Total	**0.1069**	**0.4718**	**0.7565**	**2.0800e-003**	**0.1253**	**1.6400e-003**	**0.1269**	**0.0340**	**1.5400e-003**	**0.0355**	**0.0000**	**192.4995**	**192.4995**	**0.0120**	**0.0000**	**192.7999**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.5075	0.4911	6.6000e-004		0.0334	0.0334		0.0307	0.0307	0.0000	57.6212	57.6212	0.0186	0.0000	58.0871
Total	**0.0535**	**0.5075**	**0.4911**	**6.6000e-004**		**0.0334**	**0.0334**		**0.0307**	**0.0307**	**0.0000**	**57.6212**	**57.6212**	**0.0186**	**0.0000**	**58.0871**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0137	0.3705	0.1003	1.2000e-003	0.0311	8.5000e-004	0.0319	8.9500e-003	8.1000e-004	9.7600e-003	0.0000	113.4415	113.4415	5.6900e-003	0.0000	113.5838
Worker	0.0843	0.0621	0.5804	8.0000e-004	0.0920	5.8000e-004	0.0926	0.0244	5.4000e-004	0.0250	0.0000	72.1560	72.1560	5.3100e-003	0.0000	72.2888
Total	**0.0981**	**0.4326**	**0.6807**	**2.0000e-003**	**0.1231**	**1.4300e-003**	**0.1245**	**0.0334**	**1.3500e-003**	**0.0347**	**0.0000**	**185.5975**	**185.5975**	**0.0110**	**0.0000**	**185.8725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0535	0.5075	0.4911	6.6000e-004		0.0334	0.0334		0.0307	0.0307	0.0000	57.6212	57.6212	0.0186	0.0000	58.0871
Total	**0.0535**	**0.5075**	**0.4911**	**6.6000e-004**		**0.0334**	**0.0334**		**0.0307**	**0.0307**	**0.0000**	**57.6212**	**57.6212**	**0.0186**	**0.0000**	**58.0871**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0137	0.3705	0.1003	1.2000e-003	0.0311	8.5000e-004	0.0319	8.9500e-003	8.1000e-004	9.7600e-003	0.0000	113.4415	113.4415	5.6900e-003	0.0000	113.5838
Worker	0.0843	0.0621	0.5804	8.0000e-004	0.0920	5.8000e-004	0.0926	0.0244	5.4000e-004	0.0250	0.0000	72.1560	72.1560	5.3100e-003	0.0000	72.2888
Total	**0.0981**	**0.4326**	**0.6807**	**2.0000e-003**	**0.1231**	**1.4300e-003**	**0.1245**	**0.0334**	**1.3500e-003**	**0.0347**	**0.0000**	**185.5975**	**185.5975**	**0.0110**	**0.0000**	**185.8725**

3.5 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5842					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0192	0.1336	0.1590	2.6000e-004		8.2300e-003	8.2300e-003		8.2300e-003	8.2300e-003	0.0000	22.3410	22.3410	1.5300e-003	0.0000	22.3793
Total	**0.6034**	**0.1336**	**0.1590**	**2.6000e-004**		**8.2300e-003**	**8.2300e-003**		**8.2300e-003**	**8.2300e-003**	**0.0000**	**22.3410**	**22.3410**	**1.5300e-003**	**0.0000**	**22.3793**

3.5 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0185	0.0139	0.1296	1.7000e-004	0.0188	1.2000e-004	0.0190	5.0000e-003	1.1000e-004	5.1100e-003	0.0000	15.3172	15.3172	1.1900e-003	0.0000	15.3468
Total	**0.0185**	**0.0139**	**0.1296**	**1.7000e-004**	**0.0188**	**1.2000e-004**	**0.0190**	**5.0000e-003**	**1.1000e-004**	**5.1100e-003**	**0.0000**	**15.3172**	**15.3172**	**1.1900e-003**	**0.0000**	**15.3468**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5842					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0192	0.1336	0.1590	2.6000e-004		8.2300e-003	8.2300e-003		8.2300e-003	8.2300e-003	0.0000	22.3409	22.3409	1.5300e-003	0.0000	22.3793
Total	**0.6034**	**0.1336**	**0.1590**	**2.6000e-004**		**8.2300e-003**	**8.2300e-003**		**8.2300e-003**	**8.2300e-003**	**0.0000**	**22.3409**	**22.3409**	**1.5300e-003**	**0.0000**	**22.3793**

3.5 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0185	0.0139	0.1296	1.7000e-004	0.0188	1.2000e-004	0.0190	5.0000e-003	1.1000e-004	5.1100e-003	0.0000	15.3172	15.3172	1.1900e-003	0.0000	15.3468
Total	**0.0185**	**0.0139**	**0.1296**	**1.7000e-004**	**0.0188**	**1.2000e-004**	**0.0190**	**5.0000e-003**	**1.1000e-004**	**5.1100e-003**	**0.0000**	**15.3172**	**15.3172**	**1.1900e-003**	**0.0000**	**15.3468**

3.5 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5742					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1211	0.1560	2.6000e-004		7.0300e-003	7.0300e-003		7.0300e-003	7.0300e-003	0.0000	21.9580	21.9580	1.4300e-003	0.0000	21.9937
Total	**0.5918**	**0.1211**	**0.1560**	**2.6000e-004**		**7.0300e-003**	**7.0300e-003**		**7.0300e-003**	**7.0300e-003**	**0.0000**	**21.9580**	**21.9580**	**1.4300e-003**	**0.0000**	**21.9937**

3.5 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0170	0.0125	0.1167	1.6000e-004	0.0185	1.2000e-004	0.0186	4.9100e-003	1.1000e-004	5.0200e-003	0.0000	14.5056	14.5056	1.0700e-003	0.0000	14.5323
Total	**0.0170**	**0.0125**	**0.1167**	**1.6000e-004**	**0.0185**	**1.2000e-004**	**0.0186**	**4.9100e-003**	**1.1000e-004**	**5.0200e-003**	**0.0000**	**14.5056**	**14.5056**	**1.0700e-003**	**0.0000**	**14.5323**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.5742					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1211	0.1560	2.6000e-004		7.0300e-003	7.0300e-003		7.0300e-003	7.0300e-003	0.0000	21.9580	21.9580	1.4300e-003	0.0000	21.9937
Total	**0.5918**	**0.1211**	**0.1560**	**2.6000e-004**		**7.0300e-003**	**7.0300e-003**		**7.0300e-003**	**7.0300e-003**	**0.0000**	**21.9580**	**21.9580**	**1.4300e-003**	**0.0000**	**21.9937**

3.5 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0170	0.0125	0.1167	1.6000e-004	0.0185	1.2000e-004	0.0186	4.9100e-003	1.1000e-004	5.0200e-003	0.0000	14.5056	14.5056	1.0700e-003	0.0000	14.5323
Total	**0.0170**	**0.0125**	**0.1167**	**1.6000e-004**	**0.0185**	**1.2000e-004**	**0.0186**	**4.9100e-003**	**1.1000e-004**	**5.0200e-003**	**0.0000**	**14.5056**	**14.5056**	**1.0700e-003**	**0.0000**	**14.5323**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1900e-003	0.0741	0.0767	1.1000e-004		4.1500e-003	4.1500e-003		3.8200e-003	3.8200e-003	0.0000	10.0491	10.0491	3.2500e-003	0.0000	10.1304
Paving	1.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.4000e-003**	**0.0741**	**0.0767**	**1.1000e-004**		**4.1500e-003**	**4.1500e-003**		**3.8200e-003**	**3.8200e-003**	**0.0000**	**10.0491**	**10.0491**	**3.2500e-003**	**0.0000**	**10.1304**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.7000e-004	3.4900e-003	0.0000	5.1000e-004	0.0000	5.1000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4130	0.4130	3.0000e-005	0.0000	0.4138
Total	**5.0000e-004**	**3.7000e-004**	**3.4900e-003**	**0.0000**	**5.1000e-004**	**0.0000**	**5.1000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4130**	**0.4130**	**3.0000e-005**	**0.0000**	**0.4138**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	7.1900e-003	0.0741	0.0767	1.1000e-004		4.1500e-003	4.1500e-003		3.8200e-003	3.8200e-003	0.0000	10.0491	10.0491	3.2500e-003	0.0000	10.1304
Paving	1.2100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.4000e-003**	**0.0741**	**0.0767**	**1.1000e-004**		**4.1500e-003**	**4.1500e-003**		**3.8200e-003**	**3.8200e-003**	**0.0000**	**10.0491**	**10.0491**	**3.2500e-003**	**0.0000**	**10.1304**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-004	3.7000e-004	3.4900e-003	0.0000	5.1000e-004	0.0000	5.1000e-004	1.3000e-004	0.0000	1.4000e-004	0.0000	0.4130	0.4130	3.0000e-005	0.0000	0.4138
Total	**5.0000e-004**	**3.7000e-004**	**3.4900e-003**	**0.0000**	**5.1000e-004**	**0.0000**	**5.1000e-004**	**1.3000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.4130**	**0.4130**	**3.0000e-005**	**0.0000**	**0.4138**

3.6 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0170	0.1749	0.2081	3.1000e-004		9.4100e-003	9.4100e-003		8.6500e-003	8.6500e-003	0.0000	27.5323	27.5323	8.9000e-003	0.0000	27.7549
Paving	3.3200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0203**	**0.1749**	**0.2081**	**3.1000e-004**		**9.4100e-003**	**9.4100e-003**		**8.6500e-003**	**8.6500e-003**	**0.0000**	**27.5323**	**27.5323**	**8.9000e-003**	**0.0000**	**27.7549**

3.6 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2700e-003	9.4000e-004	8.7700e-003	1.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.0899	1.0899	8.0000e-005	0.0000	1.0919
Total	**1.2700e-003**	**9.4000e-004**	**8.7700e-003**	**1.0000e-005**	**1.3900e-003**	**1.0000e-005**	**1.4000e-003**	**3.7000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.0899**	**1.0899**	**8.0000e-005**	**0.0000**	**1.0919**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0170	0.1749	0.2080	3.1000e-004		9.4100e-003	9.4100e-003		8.6500e-003	8.6500e-003	0.0000	27.5323	27.5323	8.9000e-003	0.0000	27.7549
Paving	3.3200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0203**	**0.1749**	**0.2080**	**3.1000e-004**		**9.4100e-003**	**9.4100e-003**		**8.6500e-003**	**8.6500e-003**	**0.0000**	**27.5323**	**27.5323**	**8.9000e-003**	**0.0000**	**27.7549**

3.6 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2700e-003	9.4000e-004	8.7700e-003	1.0000e-005	1.3900e-003	1.0000e-005	1.4000e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.0899	1.0899	8.0000e-005	0.0000	1.0919
Total	**1.2700e-003**	**9.4000e-004**	**8.7700e-003**	**1.0000e-005**	**1.3900e-003**	**1.0000e-005**	**1.4000e-003**	**3.7000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.0899**	**1.0899**	**8.0000e-005**	**0.0000**	**1.0919**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5189	3.4964	4.4876	0.0124	0.6035	5.5400e-003	0.6090	0.1619	5.1800e-003	0.1671	0.0000	1,154.5897	1,154.5897	0.0923	0.0000	1,156.8975
Unmitigated	0.5588	3.7393	5.4988	0.0156	0.8621	7.2600e-003	0.8693	0.2313	6.7900e-003	0.2381	0.0000	1,450.0025	1,450.0025	0.1042	0.0000	1,452.6080

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,323.00	1,323.00	1323.00	2,217,745	1,552,422
Parking Lot	0.00	0.00	0.00		
Total	1,323.00	1,323.00	1,323.00	2,217,745	1,552,422

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	7.30	3.90	3.70	40.20	19.20	40.60	86	11	3
Parking Lot	6.70	5.00	8.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624
Parking Lot	0.519925	0.031155	0.160764	0.115847	0.015498	0.004819	0.018987	0.121625	0.003553	0.001235	0.005240	0.000729	0.000624

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	535.3952	535.3952	0.0122	2.5300e-003	536.4538
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	535.3952	535.3952	0.0122	2.5300e-003	536.4538
NaturalGas Mitigated	0.0151	0.1292	0.0550	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	149.6006	149.6006	2.8700e-003	2.7400e-003	150.4896
NaturalGas Unmitigated	0.0151	0.1292	0.0550	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	149.6006	149.6006	2.8700e-003	2.7400e-003	150.4896

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.80341e +006	0.0151	0.1292	0.0550	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	149.6006	149.6006	2.8700e-003	2.7400e-003	150.4896
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0151**	**0.1292**	**0.0550**	**8.2000e-004**		**0.0104**	**0.0104**		**0.0104**	**0.0104**	**0.0000**	**149.6006**	**149.6006**	**2.8700e-003**	**2.7400e-003**	**150.4896**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.80341e +006	0.0151	0.1292	0.0550	8.2000e-004		0.0104	0.0104		0.0104	0.0104	0.0000	149.6006	149.6006	2.8700e-003	2.7400e-003	150.4896
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0151**	**0.1292**	**0.0550**	**8.2000e-004**		**0.0104**	**0.0104**		**0.0104**	**0.0104**	**0.0000**	**149.6006**	**149.6006**	**2.8700e-003**	**2.7400e-003**	**150.4896**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	874847	504.3234	0.0115	2.3800e-003	505.3206
Parking Lot	53900	31.0718	7.1000e-004	1.5000e-004	31.1332
Total		**535.3952**	**0.0122**	**2.5300e-003**	**536.4538**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	874847	504.3234	0.0115	2.3800e-003	505.3206
Parking Lot	53900	31.0718	7.1000e-004	1.5000e-004	31.1332
Total		**535.3952**	**0.0122**	**2.5300e-003**	**536.4538**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8694	0.0154	1.3404	7.0000e-005		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	2.1901	2.1901	2.1200e-003	0.0000	2.2430
Unmitigated	0.8694	0.0154	1.3404	7.0000e-005		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	2.1901	2.1901	2.1200e-003	0.0000	2.2430

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1158					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7129					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0406	0.0154	1.3404	7.0000e-005		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	2.1901	2.1901	2.1200e-003	0.0000	2.2430
Total	**0.8694**	**0.0154**	**1.3404**	**7.0000e-005**		**7.4100e-003**	**7.4100e-003**		**7.4100e-003**	**7.4100e-003**	**0.0000**	**2.1901**	**2.1901**	**2.1200e-003**	**0.0000**	**2.2430**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1158					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7129					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0406	0.0154	1.3404	7.0000e-005		7.4100e-003	7.4100e-003		7.4100e-003	7.4100e-003	0.0000	2.1901	2.1901	2.1200e-003	0.0000	2.2430
Total	**0.8694**	**0.0154**	**1.3404**	**7.0000e-005**		**7.4100e-003**	**7.4100e-003**		**7.4100e-003**	**7.4100e-003**	**0.0000**	**2.1901**	**2.1901**	**2.1200e-003**	**0.0000**	**2.2430**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	120.7540	0.3084	7.7700e-003	130.7810
Unmitigated	139.1043	0.3852	9.6600e-003	151.6147

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.7277 / 7.39357	139.1043	0.3852	9.6600e-003	151.6147
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**139.1043**	**0.3852**	**9.6600e-003**	**151.6147**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	9.38218 / 7.39357	120.7540	0.3084	7.7700e-003	130.7810
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**120.7540**	**0.3084**	**7.7700e-003**	**130.7810**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	16.8077	0.9933	0.0000	41.6403
Unmitigated	16.8077	0.9933	0.0000	41.6403

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	82.8	16.8077	0.9933	0.0000	41.6403
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**16.8077**	**0.9933**	**0.0000**	**41.6403**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	82.8	16.8077	0.9933	0.0000	41.6403
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**16.8077**	**0.9933**	**0.0000**	**41.6403**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ATTACHMENT B

Project Construction and Operational Fuel Consumption

Action	Carbon Dioxide Equivalents (CO_2e) in Metric Tons[1]	Conversion of Metric Tons to Kilograms[2]	Construction Equipment Emission Factor[2]	Total Gallons of Fuel Consumed
Project Construction	**498**	**498000**	**10.15**	**49,064**
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

Total Gallons Consumed During 2021 Project Construction: 49,064

Action	Carbon Dioxide Equivalents (CO_2e) in Metric Tons[1]	Conversion of Metric Tons to Kilograms[2]	Construction Equipment Emission Factor[2]	Total Gallons of Fuel Consumed
Project Construction	**309**	**309000**	**10.15**	**30,443**
	Per CalEEMod Output Files.	Per Climate Registry Equation 13e	Per Climate Registry Equation 13e	

Total Gallons Consumed During 2022 Project Construction: 30,443

Notes:

Fuel used by all construction equipment, including vehicle hauling trucks, assumed to be diesel.

Sources:

[1]ECORP Consulting, 2021.

[2]Climate Registry. 2016. *General Reporting Protocol for the Voluntary Reporting Program version 2.1.* January 2016. http://www.theclimateregistry.org/wp-content/uploads/2014/11/General-Reporting-Protocol-Version-2.1.pdf

Total Gallons During Project Operations [3]

Area	Sub-Area	Cal. Year	Season	Veh_tech	EMFAC 2011 Category	Fuel_GAS Output	Daily Total	ANNUAL TOTAL
Sub-Areas	Imperial	2023	Annual	All Vehicles	All Vehicles	0.437004555	437.0045551	**159,506.7**

Sources:

[3]Californai Air Resource Board. 2017. EMFAC2017 Mobile Emissions Model.

Appendix B
Biological Resources Report

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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

October 30, 2020

Mr. Bob Stark
Michael Baker International, Inc.
9755 Clairemont Mesa Boulevard
San Diego, California 92124

RE: Biological Resources Report for the El Centro Town Center Phase IV Project

Dear Mr. Stark:

This letter report describes the field assessment methods, existing biological resources, biological constraints that may exist, and potential for sensitive biological resources to be present on the property proposed for the El Centro Town Center Village Phase IV Project (proposed Project). Regulated biological resources that may occur on the property or in adjacent areas that could be affected with future development of the proposed Project are discussed as consideration for resource avoidance measures, mitigation measures, and compliance measures during construction. The purpose of this document is to inform the California Environmental Quality Act (CEQA) analysis of the proposed Project.

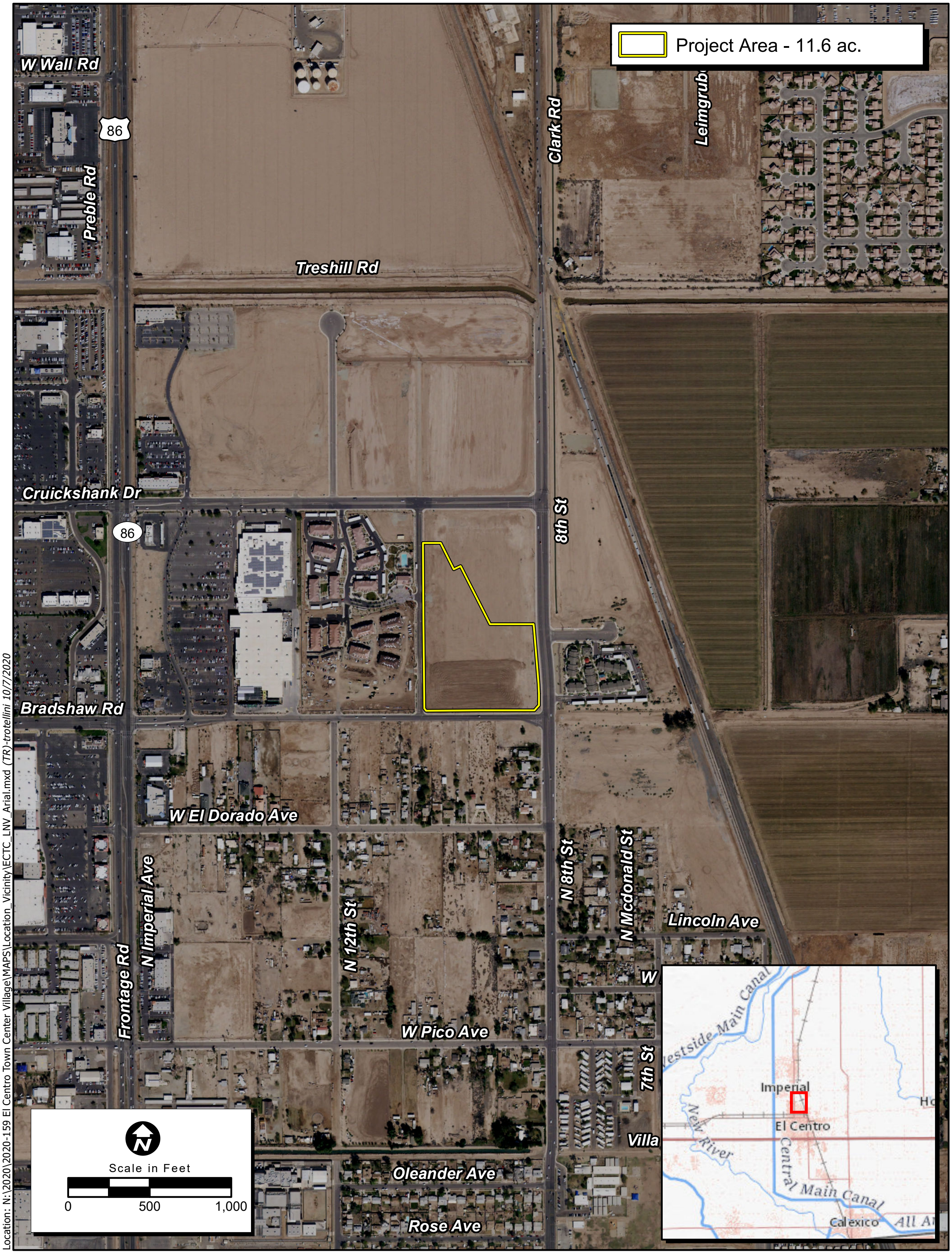
PROJECT LOCATION AND DESCRIPTION

The proposed Project is located within the City of El Centro (City), Imperial County (County), California (Figure 1). The property is located at the northeast corner of Bradshaw Avenue and North 10th Street in El Centro and the includes California Assessor's Parcel Number [APN] 044-620-049-001 and a portion of APN 044-620-051). As depicted on the United States Geological Survey (USGS) 7.5-minute El Centro topographic quadrangle, the proposed Project is located in Section 30 of Township 15 South, Range 14 East, San Bernardino Base and Meridian. The area assessed for this report includes the approximately 11.6 acre property (Project Area) and a 500-foot buffer around the property (cumulatively referred to as the Survey Area).

The El Centro Town Center Village Phase IV Project would result in the rezoning of two parcels located in the City of El Centro's Town Center Village from CG-General Commercial to R3-Multiple Family Residential. The project applicant is requesting the rezone to allow for future development of a 180-unit apartment complex. A General Plan Amendment is also required to change the existing General Plan land use designation from General Commercial to High Density Residential. The City will act as the lead agency for the project relative to California Environmental Quality Act (CEQA) requirements.

REGIONAL AND REGULATORY CONTEXT

The proposed Project is subject to the policies outlined in the El Centro General Plan Conservation/Open Space Element (City of El Centro 2004). The element establishes a comprehensive and long-range conservation plan for of local resources such as agricultural land, deserts, water, air quality and energy



Location: N:\2020\2020-159 El Centro Town Center Village\MAPS\Location_Vicinity\ECTC_LNV_Arial.mxd (TR)-trotellini 10/7/2020

Photo Source: NAIP (2018), Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Map Date: 10/7/2020

Figure 1. Project Location and Vicinity

2020-159 El Centro Town Center Village

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ENVIRONMENTAL CONSULTANTS

and other open space areas. This element of the General Plan also provides guidance related to the protection of habitat/wildlife resources. The element was reviewed for any City policies relating to potentially affected biological resources. Policy 3.2 of the element specifies to "utilize the environmental review process to evaluate and mitigate impacts to natural resources and plant and animal habitats that may be affected by proposed development" (City of El Centro 2004). This document is in support of that review process.

Additional federal, state, and local regulations also apply to the proposed Project. Table 1 provides a summary of the regulations considered and under which the resources on the property were evaluated for this study.

Table 1. Applicable Federal, State, and Local Regulations

Federal Regulations		
Regulation	**Resource**	**Regulating Agency(ies)**
Federal Endangered Species Act	Listed "Endangered" or "Threatened" plant and animal species	USFWS
Migratory Bird Treaty Act	Migratory birds, or their parts, nests, or eggs	USFWS
Clean Water Act	"Waters of the U.S." – aquatic resources	USACE/SWRCB
State Regulations		
Regulation	**Resource**	**Regulating Agency**
California Endangered Species Act	Listed "Endangered," "Threatened," or "Candidate" native species and their habitats	CDFW
Fully Protected Species	Fish, wildlife, and native plants	CDFW
Native Plant Protection Act	64 species, subspecies, and varieties of endangered or rare native plants	CDFW
California Fish and Game Code	37 California ESA threatened or endangered species that are rare or face possible extinction; Section 1600 protection of streambeds and associated riparian habitat; Section 4150: protection of non game mammals	CDFW
Porter-Cologne Water Quality Control Act/ California Water Code	"Waters of the State" – aquatic resources	SWRCB
Local Regulations		
Regulation	**Resource**	**Regulating Agency**
CEQA Significance Criteria	Special status species, riparian habitat or sensitive natural communities, federal wetlands, and wildlife movement and nursery sites	City of El Centro
El Centro General Plan Conservation/Open Space Element	Natural resources such as water, soils, wildlife, minerals, and air quality.	City of El Centro

*ESA = Endangered Species Act; USFWS = U.S. Fish and Wildlife Service; MBTA = Migratory Bird Treaty Act; CWA = Clean Water Act; SWRCB = State Water Resources Control Board; CDFW = California Department of Fish and Wildlife; CEQA = California Environmental Quality Act

METHODS

Background Review

ECORP conducted background research, which included a review of standard resources including the latest version of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) within five miles of the Project Area (CNDDB; CDFW 2020a), CDFW Special Animals Lists (CDFW 2020b) U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal and Information for Planning and Consultation (IPaC) Trust Resource List (USFWS 2020a), California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Plants (CNPS 2020), Calflora Information on California Plants (Calflora 2020) and USFWS National Wetland Inventory (USFWS 2020b) as preparation for a field visit and reporting.

Using desktop review information and observations in the field, a list of special-status plant and wildlife species that have potential to occur within the Project Area and Survey Area was generated. For the purpose of this assessment, special-status species are defined as plants or wildlife that:

- have been designated as either rare, threatened, or endangered by CDFW, CNPS, or the USFWS, and/or are protected under either the federal or California Endangered Species Acts (ESAs);
- are candidate species being considered or proposed for listing under these same acts;
- are fully protected by the California Fish and Game Code, §§ 3511, 4700, 5050, or 5515; and/or
- are of expressed concern to resource and regulatory agencies or local jurisdictions.

Potential for occurrence of special-status species were determined based on the following guidelines:

- **Present:** The species was observed within the Survey Area during a site visit.
- **High:** Habitat (including soils and elevation factors) for the species occurs within the Survey Area and a known occurrence has recently been recorded (within the last 20 years) within five miles of the area.
- **Moderate:** Habitat (including soils and elevation factors) for the species occurs within the Survey Area and a documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within five miles of the Survey Area; or a recently documented observation occurs within five miles of the area and marginal or limited amounts of habitat occurs in the Survey Area.
- **Low:** Limited or marginal habitat for the species occurs within the Survey Area and a recently documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within five miles of the Survey Area; or suitable habitat strongly associated with the species occurs within the Survey Area, but no records or only historic records were found within the database search.
- **Presumed Absent:** Species was not observed during a site visit or focused surveys conducted in accordance with protocol guidelines at an appropriate time for identification; habitat (including

soils and elevation factors) does not exist within the Survey Area; or the known geographic range of the species does not include the Survey Area.

Field Survey

Following the literature review, qualified ECORP biologist Caroline Garcia conducted a field assessment throughout the Survey Area on October 1, 2020, from 6:45 a.m. to 9:30 a.m., to further examine the biological resources present on the property and to determine the potential presence for special-status biological resources.

The Survey Area was surveyed on foot by a biologist familiar with the biological resources located in the regional vicinity of the property. The Project Area was surveyed to provide for 100 percent visual coverage. Where access was restricted within the Survey Area, the biologist scanned for biological resources using binoculars. Focused protocol-level surveys were not conducted as a part of this visit. Vegetation mapping was conducting using aerial imagery and ground-truthed during field surveys. The habitat and vegetation community mapping follows the classifications described in A Manual of California Vegetation (Sawyer et al. 2009). Draft Vegetation Communities of San Diego County was also used as a reference (Oberbauer et al. 2008). The ArcGIS Collector™ application was utilized to map the vegetation communities and land covers and record any special-status biological resources directly in the field. Plant and wildlife species observed during the survey were recorded and representative photographs of the property were taken (Attachment A). Binoculars were used to aid in bird and butterfly identifications.

RESULTS

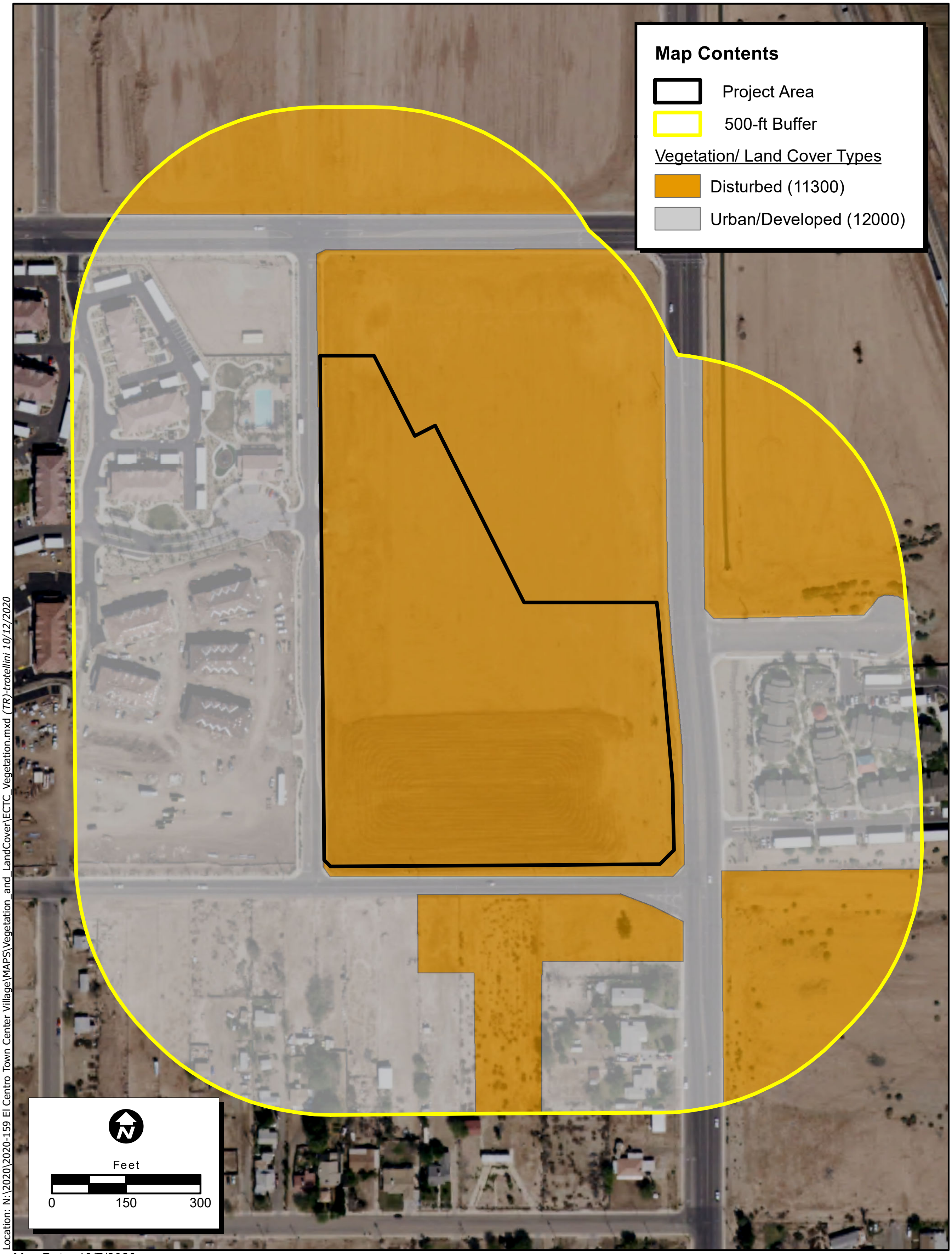
The field assessment confirmed that the proposed Project will be constructed within previously graded and disturbed grounds of the Town Center Village Apartments property. Other existing uses within the Survey Area include apartment complexes, private residences, and vacant disturbed lots. Topography is relatively flat with elevation ranging between -16 meters (-51 feet) and -12 meters (-39 feet) below mean sea level. Weather conditions consisted of temperatures ranging from 70° – 84° Fahrenheit, 0 percent cloud coverage, and wind speeds of 0 to 10 miles per hour.

Habitats and Vegetation Communities

Figure 2 identifies the location of each vegetation community and land cover in the Survey Area and is described in detail below. Representative photographs of the habitats within the Survey Area are included in Attachment A.

Disturbed Habitat (Holland Code 11300)

Disturbed habitat is characterized as an area that has been previously modified by anthropogenic effects but retains soils and largely comprises ruderal, nonnative vegetation (Oberbauer et al. 2008) that typically



Location: N:\2020\2020-159 El Centro Town Center Village\MAPS\Vegetation_and_LandCover\ECTC_Vegetation.mxd (TR)-trotellini 10/12/2020

Map Date: 10/7/2020
Photo Source: NAIP (2018)

Figure 2. Vegetation Communities and Land Cover

2020-159 El Centro Town Center Village

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has little ecological value. The entirety of the Project Area is classified as disturbed habitat (Figure 2). The dominant plant species observed included native herbs bush seepweed (*Suaeda nigra*) and silverscale saltbush (*Atriplex argentea*); and non-native herbs tamarisk (*Tamarix ramosissima*) and five-hook bassia (*Bassia hyssopifolia*). These plant species were located on the periphery of the Project Area as the central portion of the Project Area was recently graded and did not support vegetation. Portions of the buffer of the Project Area are also classified as Disturbed: vacant lots to the north, south, and east. Vegetation consists of native herbs bush seepweed and silverscale saltbush. Ruderal species include tamarisk, five-hook bassia, Russian thistle (Salsola tragus), and puncture vine (Tribulus terrestris), as well as nonnative grasses including red brome (Bromus madritensis ssp. rubens).

Urban/Developed (Holland Code 12000)

A majority of the buffer of the Project Area consists of Urban and Developed land. Urban/Developed areas do not constitute a vegetation classification, but rather a land cover type. Areas mapped as Developed have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported (Oberbauer et al. 2008). Apartment complexes comprise the majority of the western portion of the Survey Area, as well as some of the eastern portion. Private residences comprise a majority of the southern portion of the Survey Area. Vegetation consists of a mix of landscaped groundcovers, nonnative herbs, and ornamental and landscaped trees including Peruvian pepper tree (*Schinus molle*), Mexican fan palm (*Washingtonia robusta*), and date palm (*Phoenix dactylifera*).

General Wildlife Species

The Survey Area provides habitat for wildlife species that commonly occur in developed and disturbed areas. Wildlife observed within the Survey Area included rock pigeon (*Columba livia)*, mourning dove (*Zenaida macroura*), Eurasian collared dove (*Streptopelia decaocto*), house finch (*Haemorhous mexicanus*), great-tailed grackle (*Quiscalus mexicanus*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), and American crow (*Corvus brachyrhynchos*). Although the trees within the buffer of the Project Area provide suitable nesting and roosting opportunities for bird species, no nests (active or inactive) were observed during the field assessment.

Special-Status Species

No special-status plant or wildlife species were observed within the Survey Area during the field assessment. Special-status plants and wildlife species reported for the region in the literature review or for which suitable habitat occurs were evaluated for their potential to occur within the Project Area or in adjacent areas where indirect impacts could occur.

Special-Status Plants

No special-status plants were observed during the field assessment. All special-status plants were determined unlikely to occur within the Project Area and Survey Area due to the lack of suitable habitat and/or other conditions such as soil or elevation. Justifications for the conclusions regarding potential to occur are provided in Attachment B.

Special-Status Wildlife

No special-status wildlife were observed during the field assessment. The special-status wildlife species with occurrence records in the area were assessed for potential to occur within the Survey Area. Justifications for the conclusions regarding potential to occur are provided in Attachment C.

One special-status wildlife species, burrowing owl (*Athene cunicularia*), a federal Bird of Conservation Concern and a California Species of Special Concern, was determined to have a moderate potential to occur within the Survey Area.

Burrowing owl is a small owl typically found in dry open areas with few trees and short grasses such as prairie, pastures, and desert scrublands. This species is also found near human habitation in agricultural areas, vacant lots, and airports. It uses uninhabited mammal burrows for roosts and nests, oftentimes in close proximity to California ground squirrel (*Otospermophilus beecheyi*) colonies. It primarily feeds on large insects and small mammals, but will also eat birds and amphibians. The disturbed lot of the Project Area provides habitat for burrowing owl, however the soils in the Project Area are not suitable for burrowing. Some of the disturbed lots in the buffer of the Project Area have more suitable soils for burrowing. Materials are staged within the southwestern portion of the Project Area, some of which could be utilized by burrowing owl, but no burrowing owl sign was observed. No mammal burrows or berms were observed throughout the entirety of the Survey Area. There are 19 recent CNDDB records within five miles of the site with the closest being approximately two miles away. Due to the presence of moderately suitable habitat and known records within five miles of the site, this species was determined to have a moderate potential to occur.

U.S. Fish and Wildlife Service Designated Critical Habitat

The proposed project is not located within any USFWS-designated Critical Habitat.

Migratory Birds and Raptors

Native bird species and their nests are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 United States Code 703- 712). Potential nesting habitat within the Project Area is limited to birds that nest on the ground and in open, sparsely vegetated habitat. The Project Area provides limited foraging habitat for migratory bird species and raptors. The buffer of the Project Area contains ornamental, landscaped trees and shrubs that could provide nesting habitat for migratory bird species and, in some locations, for raptors; however, they are situated adjacent to highly trafficked areas (i.e., roads and structures). Therefore, raptor species are not expected to use these trees for nesting. Disturbed areas within the buffer of the Project Area appear to be consistently tended (i.e., graded lot) or contain little vegetation; therefore, foraging habitat is of low quality for raptors. No nests were observed within the Survey Area during the field survey.

Jurisdictional Wetlands and Waterways

There are no jurisdictional wetlands and/or waterways in the Project Area. A manmade concrete-lined channel, Date Canal, runs north-south in the buffer to the east of the Project Area between North 8th

Street and the railroad tracks. Date Canal is managed by the Imperial Irrigation District and is not considered a jurisdictional waterway.

Wildlife Corridors and Linkages

There are no wildlife corridors and/or linkages in the Survey Area. There is low potential for wildlife to use or pass through the area as a corridor, as most of the surrounding land is already developed residential, commercial, and agriculture land.

PROJECT EFFECTS AND SIGNIFICANCE DETERMINATION

For the purposes of this analysis, direct and indirect impacts will be analyzed for biological resources recorded within the Survey Area or those with the potential to occur within the Survey Area upon future development of the property. Direct impacts include the primary effects of construction that displace habitats and species. For the proposed Project, this includes the entirety of the Project Area. Indirect impacts occur from a secondary effect of construction activities or long-term effects of a development. This type of impact could include habitat isolation, urban edge effects, exotic species invasion, vehicular noise or increased human or pet intrusion. The magnitude of an indirect impact can be as significant as that of a direct impact, depending on the circumstances.

The proposed Project would not have significant impacts, either directly or indirectly, on a formally listed or candidate species for listing by the CDFW or USFWS. Impacts to habitats also to not apply to the proposed Project because the entirety of the Project Area is a graded, disturbed lot.

Following is a discussion of the biological resources, by type, and expected impacts.

Habitats and Vegetation Communities

Direct Impacts

All disturbance and staging will occur within previously graded areas, consisting of direct impacts to ±11.6 acres of disturbed land. Because this habitat is not considered a sensitive biological resource, there is no significant impact to habitats and vegetation communities due to implementation of the proposed Project.

Indirect Impacts

Habitats and land cover within the Survey Area are not considered sensitive biological resources; therefore there is no significant impact to habitats and vegetation communities due to implementation of the proposed Project.

Special-Status Species

Direct Impacts

There is potential for burrowing owl, migratory and nesting birds to be impacted by Project activities. Although no burrowing owl or potential burrows, and no nesting birds were identified during the field assessment, conditions may change by the time construction activities begin. More vegetation could grow within the Project Area if not maintained, and this along with the bare ground could provide suitable nesting habitat for ground dwelling/sparse shrub nesting birds. Approximately 2/3 of the burrowing owl population in California occurs in agricultural areas in the Imperial Valley (County of Imperial 2016), by which the Survey Area is bordered to the east. Soils within the Project Area could become compacted enough to become suitable for California ground squirrel and other mammal burrowing. Because the literature search found recent occurrences of burrowing owl in the area, an assessment closer to Project construction is recommended. Direct impacts to nesting raptors are not anticipated.

Direct impacts to special-status species are possible and, if they occur to the extent that a species or its nest is harmed or breeding activities cease, this impact would be considered significant. Mitigation for this impact can be found below in Mitigation Measures BIO-1 and BIO-2. Implementation of BIO-1 and BIO-2 will reduce direct impacts to special-status species to a less than significant level.

Indirect Impacts

There is potential for burrowing owl, and migratory and nesting birds to be indirectly impacted by Project activities as habitat for these species is of better quality within the buffer of the Project Area.

Indirect impacts to special-status species are possible and, if they occur to the extent that a species or its nest is harmed or breeding activities cease, then this impact would be considered significant. Mitigation for this impact can be found below in Mitigation Measures BIO-1 and BIO-2. Implementation of BIO-1 and BIO-2 will reduce indirect impacts to special-status species to a less than significant level.

RECOMMENDED MITIGATION MEASURES

The following mitigation measures are recommended to reduce identified impacts for the proposed Project to a level below significance:

BIO-1: **Compliance with Migratory Bird Treaty Act.** Construction activities (for example, but not limited to staging, site preparation, grading) for the Project shall be conducted during the non-breeding season for birds (September 16th through December 31st). This will avoid violations of the MBTA and California Fish and Game Code Sections 3503, 3503.5 and 3513. If activities with the potential to disrupt nesting birds are scheduled to occur or is ongoing during the bird breeding season (January 1st through July 31st for raptors and March 1st through September 15th for songbirds), a pre-construction nesting bird survey shall be conducted by a qualified biologist. These surveys should be performed within three days prior to the commencement of construction activities or if construction activities are ongoing, within three days prior to January 1st. Surveys should include the construction area plus a 500-foot buffer. Survey findings would be documented prior to initiating any construction activities. If no nesting birds are observed during the survey, implementation of Project activities may begin. If nesting birds (including nesting raptors) are found to be present, avoidance or minimization measures shall be undertaken. Measures shall include establishment of an avoidance buffer until nesting has been completed. The width of the buffer will be determined by the biologist based on CDFW recommendations. The qualified biologist will determine the appropriate buffer size and level of nest monitoring necessary for species not listed under the federal or California ESAs based on the species' life history, the species' sensitivity to disturbances (e.g., noise, vibration, human activity), individual behavior, status of nest, location of nest and site conditions, presence of screening vegetation, anticipated project activities, ambient noise levels compared to project-related noise levels, existing non-project-related disturbances in vicinity, and ambient levels of human activity.

Buffers will be marked (flagged or fenced with environmentally sensitive area fencing) around any active nests and periodic monitoring by the qualified biologist will occur to ensure the project does not result in the failure of the nest. The buffer(s) will be maintained around each nest until the nest becomes inactive as determined by the qualified biologist. At the discretion of the qualified biologist, if a nesting bird appears to be stressed as a result of project activities and the buffer does not appear to provide adequate protection, additional minimization measures may need to be implemented.

Construction may continue outside of the no-work buffers. The qualified biologist will ensure that restricted activities occur outside of the delineated buffers, check nesting birds for any potential indications of stress, and ensure that installed fencing or flagging is properly maintained during nest monitoring and any additional site visits. Buffer sizes may be adjusted (either increased or reduced), or the extent of nest monitoring may be adjusted, at the discretion of the qualified biologist based on the conditions of the surrounding area and/or the behavior of the nesting bird.

Any changes to buffer sizes and/or nest monitoring frequency will be documented.

If listed species are found to be nesting in the Survey Area, construction activity should not occur without coordination with regulating agencies and may require an agency-approved bird management plan.

BIO-2: **Burrowing Owl Habitat Assessment.** A pre-construction habitat assessment shall be required for burrowing owls within the one-month period prior to construction. The habitat assessment shall be conducted within the impact area and a 500-foot buffer (where practicable) to assess the area for suitable habitat and the presence of any burrows or burrow surrogates (e.g., culverts, open drain tiles, riprap, and/or discarded tires). If no burrows or burrow surrogates are present, a survey shall not be required. If burrows or burrow surrogates are present, a pre-construction burrowing owl survey shall be required between 14 and 30 days prior to the start of construction.

BIO-1 and BIO-2 can occur concurrently if Project and seasonal timing allows.

SIGNIFICANCE OF PROJECT EFFECTS

The proposed Project will not have significant direct effects on biological resource with appropriate mitigation measures implemented to avoid impacts to sensitive resources that could occupy the area such as covered species.

Sincerely,

Caroline Garcia

Caroline Garcia
Associate Biologist
ECORP Consulting, Inc.

Figures and Attachments

Figure 1: Project Location and Vicinity
Figure 2: Vegetation Communities and Land Cover
Attachment A: Site Photos
Attachment B: Special-Status Plant Potential for Occurrence
Attachment C: Special-Status Wildlife Potential for Occurrence

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ATTACHMENT A

Site Photos

Photo 1: View from the center of the Project Area (facing north, October 1, 2020).

Photo 2: View from the center of the Project Area (facing south, October 1, 2020).

Photo 3: View of the Project Area from eastern extent (facing west, October 1, 2020).

Photo 4: Staged materials in the southwestern portion of the Project Area (facing southwest, October 1, 2020).

Photo 5: Asphalt pile in the western section of the Project Area (facing south, October 1, 2020).

Photo 6: Eastern section of the Project Area with minor vegetation (facing north, October 1, 2020).

Photo 7: Disturbed lot directly east of the Project Area (facing northeast, October 1, 2020).

Photo 8: Date Canal directly east of the Project Area (facing north, October 1, 2020).

Photo 9: Apartments directly west of the Project Area (facing northwest, October 1, 2020).

Photo 10: View of a disturbed lot and adjacent private residence directly south of the Project Area (facing northeast, October 1, 2020).

ATTACHMENT B

Special-Status Plant Potential for Occurrence

Special-Status Plant Species with Potential for Occurrence				
Scientific Name **Common Name**	**Status**	**Blooming Period/ Elevation Range (meters)**	**Habitat**	**Potential for Occurrence**
Abronia villosa var. *aurita* chaparral sand-verbena	**USFWS**: None **CDFW**: None **CRPR**: 1B.1	Mar-Sep (75 - 1600)	Chaparral Coastal scrub Desert dunes	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Amaranthus watsonii Watson's amaranth	**USFWS**: None **CDFW**: None **CRPR**: 4.3	Apr-Sep (20 - 1700)	Mojavean desert scrub Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Astragalus magdalenae var. *peirsonii* Peirson's milk-vetch	**USFWS**: Threatened **CDFW**: Endangered **CRPR**: 1B.2	Dec-Apr (60 - 225)	Desert dunes	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Astragalus sabulonum gravel milk-vetch	**USFWS**: None **CDFW**: None **CRPR**: 2B.2	Feb-Jun (-60 - 930)	Desert dunes Mojavean desert scrub Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area but it is within the known elevation of the species; a historic record exists within 5 miles.
Cylindropuntia wolfii Wolf's cholla	**USFWS**: None **CDFW**: None **CRPR**: 4.3	Sep-May (100 – 1200)	Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.

Special-Status Plant Species with Potential for Occurrence				
Scientific Name **Common Name**	**Status**	**Blooming Period/ Elevation Range (meters)**	**Habitat**	**Potential for Occurrence**
Eucnide rupestris annual rock-nettle	**USFWS**: None **CDFW**: None **CRPR**: 2B.2	Dec-Apr (500-600)	Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Euphorbia abramsiana Abrams' spurge	**USFWS**: None **CDFW**: None **CRPR**: 2B.2	Sep-Nov (-5 - 1310)	Mojavean desert scrub Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Imperata brevifolia California satintail	**USFWS**: None **CDFW**: None **CRPR**: 2B.1	Sep-May (0 - 1215)	Chaparral Coastal scrub Mojavean desert scrub Meadows and seeps Riparian scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Johnstonella costata ribbed cryptantha	**USFWS**: None **CDFW**: None **CRPR**: 4.3	Feb-May (-60 - 500)	Desert dunes Mojavean desert scrub Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area but it is within the known elevation of the species; no records occur within 5 miles of the site.
Johnstonella holoptera winged cryptantha	**USFWS**: None **CDFW**: None **CRPR**: 4.3	Mar-Apr (100 - 1690)	Mojavean desert scrub Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.

Special-Status Plant Species with Potential for Occurrence				
Scientific Name **Common Name**	**Status**	**Blooming Period/ Elevation Range (meters)**	**Habitat**	**Potential for Occurrence**
Lycium parishii Parish's desert-thorn	**USFWS**: None **CDFW**: None **CRPR**: 2B.3	Mar-Apr (135 - 1000)	Coastal scrub Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Malperia tenuis brown turbans	**USFWS**: None **CDFW**: None **CRPR**: 2B.3	Mar-Apr (15 - 335)	Sonoran desert scrub Sandy, gravelly soils	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Mentzelia hirsutissima hairy stickleaf	**USFWS**: None **CDFW**: None **CRPR**: 4.3	Feb-Apr (0 – 700)	Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Nama stenocarpa mud nama	**USFWS**: None **CDFW**: None **CRPR**: 2B.2	Mar-Oct (0 – 700)	Marshes and swamps Lake margins Riverbanks	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.
Pholisma sonorae sand food	**USFWS**: None **CDFW**: None **CRPR**: 1B.2	Apr-Jun (0 - 200)	Desert dunes Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.

Special-Status Plant Species with Potential for Occurrence				
Scientific Name **Common Name**	**Status**	**Blooming Period/ Elevation Range (meters)**	**Habitat**	**Potential for Occurrence**
Pilostyles thurberi Thurber's pilostyles	**USFWS**: None **CDFW**: None **CRPR**: 4.3	Dec-Apr (0 - 365)	Sonoran desert scrub	**Presumed absent:** Suitable habitat is not present within the Project Area and it is outside the known elevation of the species; no records occur within 5 miles of the site.

California Native Plant Society (CNPS) Rare Plant Ranks:
1B: Plants rare, threatened, and endangered in California and elsewhere.
2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
4: Plants of limited distribution; a watch list.

CNPS Threat Ranks:
0.1: Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2: Fairly threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Sources:
California Natural Diversity Data Base (CNDDB) (CDFW 2020a)
CNPS Rare and Endangered Plant Inventory (CNPS 2020)
Calflora Information on California Plants (Calflora 2020)
IPaC (USFWS 2020a)

ATTACHMENT C

Special-Status Wildlife Potential for Occurrence

Special-Status Wildlife Species with Potential for Occurrence				
Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
AMPHIBIANS				
RANIDAE (true frogs)				
Lithobates pipiens northern leopard frog	USFWS: CDFW:	none SSC	Inhabits a variety of aquatic habitats that include slow-moving or still water along streams and rivers, wetlands, permanent or temporary pools, beaver ponds, bogs, marshes, and human-constructed habitats such as earthen stock tanks, canals, and borrow pits.	**Presumed absent:** Site is outside of native range of this species. One historic record within 5 miles of the site; noted to be a transplant outside of native range.
REPTILES				
PHRYNOSOMATIDAE (spiny lizards)				
Phrynosoma mcallii flat-tailed horned lizard	USFWS: CDFW:	none SSC	Desert scrub on sandy flats and valleys with little or no windblown sand, salt flats, and areas with gravelly soils.	**Presumed absent:** No suitable habitat present for this species. No records occur within 5 miles of the site.
VIPERIIDAE (vipers)				
Crotalus ruber red-diamond rattlesnake	USFWS: CDFW:	none SSC	Coastal chaparral, arid scrub, rocky grassland, oak and pine woodlands, desert mountain slopes and rocky desert flats.	**Presumed absent:** No suitable habitat present for this species. No records occur within 5 miles of the site.
BIRDS				
ALAUDIDAE (larks)				
Eremophila alpestris actia California horned lark	USFWS: CDFW:	none WL	Bare open areas dominated by low vegetation or widely scattered shrubs, includes prairies, deserts, and plowed fields. Nests in a hollow on the ground.	**Low:** The disturbed areas of the Project Area and buffer with scattered shrubs provide marginally suitable habitat. No records occur within 5 miles of the site.
LANIIDAE (shrikes)				
Lanius ludovicianus loggerhead shrike	USFWS: CDFW:	BCC SSC	Open country, with scattered shrubs and trees or other perches for hunting; includes agricultural fields, deserts, grasslands, savanna, and chaparral. Nests 2.5 to 4 feet off ground in thorny vegetation.	**Low:** The disturbed areas of the Project Area and buffer with scattered shrubs provides marginally suitable habitat. No records occur within 5 miles of the site.

Special-Status Wildlife Species with Potential for Occurrence				
Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
POLIOPTILIDAE (gnatcatchers)				
Polioptila melanura black-tailed gnatcatcher	USFWS: CDFW:	none WL	Semiarid and desert thorn scrub habitats. This species is well adapted to dry habitats and tend to be most common in areas with less than 8 inches of annual rainfall. They often live far from streams and other bodies of water.	**Presumed absent:** No suitable habitat present for this species. No records occur within 5 miles of the site.
TYRANNIDAE (tyrant flycatchers)				
Pyrocephalus rubinus vermilion flycatcher	USFWS: CDFW:	none SSC	Arid scrublands, farmlands, deserts, parks, and canyon mouths. They are especially reliant on stream corridors with presence of willow, cottonwood, sycamore, mesquite, and other trees.	**Presumed absent:** No suitable habitat present for this species. One historic record within 5 miles of the site.
STRIGIDAE (owls)				
Athene cunicularia burrowing owl	USFWS: CDFW:	BCC SSC	Open grasslands including prairies, plains, and savannah; desert scrub with washes and arroyos; fallow fields, former agricultural lands, vacant lots, and airports. Nests in abandoned mammal burrows. This species adapts well to areas of human disturbance.	**Moderate:** The disturbed lot provides habitat however the soils in the Project Area are not suitable for burrowing. The disturbed lots in the buffer have more suitable soils for burrowing. Twenty four records occur within 5 miles of the site: five are historic records and nineteen are recent records with the closest being approximately 2 miles away in 2006.
MAMMALS				
MOLOSSIDAE (free-tailed bats)				
Nyctinomops macrotis big free-tailed bat	USFWS: CDFW:	none SSC	Roosts in cliff crevices, and less often in buildings, caves, and tree cavities. Occurs in rocky areas of rugged and hilly country including woodlands, evergreen forests, river floodplain-arroyo habitats, and desert scrub.	**Presumed absent:** No suitable roosting habitat within site or in buffer. One historic record occurs within 5 miles of the site.

Special-Status Wildlife Species with Potential for Occurrence				
Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
VESPERTILIONIDAE (evening bats)				
Antrozous pallidus pallid bat	USFWS: CDFW:	none SSC	Roosts in rock crevices, caves, mines, buildings, bridges, and in trees. Generally, in mountainous areas, lowland desert scrub, arid grasslands near water and rocky outcrops, and open woodlands.	**Low:** There is limited suitable roosting habitat within the buffer. No records occur within 5 miles of the site.
Corynorhinus townsendii Townsend's big-eared bat	USFWS: CDFW:	none SSC	Roosts in mines, caves, buildings, or other crevices, sometimes trees. Usually requires large crevices. Most common in moist areas or those with access to water.	**Low:** There is limited suitable roosting habitat within the buffer. No records occur within 5 miles of the site.
Lasiurus xanthinus western yellow bat	USFWS: CDFW:	none SSC	Roosts in trees, particularly palms, in desert wash, desert riparian, valley foothill riparian, and palm oasis habitats.	**Low:** There is marginally suitable roosting habitat within the buffer in the palm trees. This species has a strong association with roosting under dead palm fronds. Three historic records occur within 5 miles of the site.
CRICETIDAE (New World rats and mice)				
Sigmodon hispidus eremicus Yuma hispid cotton rat	USFWS: CDFW:	none SSC	Inhabits a variety of habitats, but generally associated with drainage ditches, canals, and seeps vegetated with plants such as arrow weed, saltgrass, common reed, cattails, sedges, tamarisk, heliotrope, and annual grasses. They utilize runways through dense herbaceous growth and nests are built of woven grass. Noted presence in moist agricultural fields.	**Low:** There is marginally suitable habitat within the buffer in the form of a man-made channel; however, it lacks vegetation. One recent record occurs within 5 miles of the site. Species was found at the junction of Alder canal and a central drain in 2008, four miles northeast of El Centro.
MURIDAE (mice, rats, and voles)				
Neotoma albigula venusta Colorado Valley woodrat	USFWS: CDFW:	none none	Desert grasslands, semiarid shrublands, mesquite-creosote scrub, saguaro cactus communities, pinyon-juniper woodlands, and interior ponderosa pine forests.	**Presumed absent:** No suitable habitat present for this species. One historic record occurs within 5 miles of the site.

Special-Status Wildlife Species with Potential for Occurrence				
Scientific Name Common Name	**Status**		**Habitat Requirements**	**Potential for Occurrence**
MUSTELIDAE (weasels and relatives)				
Taxidea taxus American badger	USFWS: CDFW:	none SSC	Open habitats with friable soil such as grasslands, brushlands with sparse ground cover, open chaparral, and sometimes riparian zones.	**Presumed absent:** No suitable habitat present for this species. One historic record within 5 miles of the site.
Federal designations: (Federal Endangered Species Act, USFWS) **END**: Federally Listed, Endangered **THR**: Federally Listed, Threatened **CAN:** Federal Candidate Species FSC: Federal Species of Concern FPD: Federal Proposed for Delisting BCC: Bird of Conservation Concern			**State designations**: (California Endangered Species Act, CDFW) **END**: State Listed, Endangered **THR**: State Listed, Threatened **CAN:** State Candidate Species SSC: California Species of Special Concern FP: Fully Protected Species WL: Watch List	

Sources:

California Natural Diversity Data Base (CNDDB) (CDFW 2020a)
Special Animals List (CDFW 2020b)
IPaC (USFWS 2020a)

Appendix C
Cultural Resources Inventory

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Cultural Resources Inventory

El Centro Town Center Village Phase IV

Imperial County, California

Prepared For:

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John O'Connor, Ph.D., RPA

October 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

MANAGEMENT SUMMARY

In 2020, ECORP Consulting, Inc. was retained to conduct a cultural resources inventory and historic building evaluation for the proposed El Centro Town Center Village Phase IV Project in the City of El Centro, Imperial County, California. The City of El Centro is proposing the rezoning of the parcels identified as Assessor's Parcel Number (APN) 044-620-049-001 and a portion of APN 044-620-051, located at the northeastern corner of Bradshaw Avenue and North 10th Street in El Centro, California, from CG-General Commercial to R3-Multiple Family residential. The property owner is requesting rezoning to allow development of a 180-unit apartment complex.

The cultural resources inventory included a records search, literature review, and field survey. A records search of the California Historical Resources Information System at the South Coastal Information Center revealed that 28 cultural resources investigations had previously been conducted in or within one mile of the Project Area. Three cultural resources were previously recorded within one mile of the Project Area as a result of these investigations; however, no cultural resources have been previously identified within the Project Area itself. A search of the Sacred Lands File was completed by the California Native American Heritage Commission and resulted in a negative finding, meaning that no Native American Sacred Lands have been recorded in the Project Area.

No cultural resources were identified or recorded as a result of the field survey. Recommendations for the management of unanticipated discoveries are provided.

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LIST OF ATTACHMENTS

Attachment A – Records Search Confirmation
Attachment B – Sacred Lands File Coordination
Attachment C – Project Area Photographs

LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
APE	Area of Potential Effects
APN	Assessor Parcel Number
BLM	Bureau of Land Management
BP	Before present
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of El Centro
CRHR	California Register of Historical Resources
CHRIS	California Historical Resources Information System
GLO	General Land Office
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
Project	El Centro Town Center Village Phase IV Project
PRC	Public Resources Code
RPA	Registered Professional Archaeologist
SCIC	South Coastal Information Center
USC	U.S. Code
USGS	U.S. Geological Survey

1.0 INTRODUCTION

In 2020, ECORP Consulting, Inc. was retained by Michael Baker International to conduct a cultural resources inventory of the proposed El Centro Town Center Village Phase IV Project Area located at the northeastern corner of Bradshaw Avenue and North 10th Street in the City of El Centro, California (Assessor's Parcel Number [APN] 044-620-049-001 and a portion of APN 044-620-051). A survey of the property was required to identify potentially eligible cultural resources (archaeological sites and historic-period buildings, structures, and objects) that could be affected by the Project. The City is the Lead Agency for the Project. No cultural resources were recorded as a result of the inventory.

1.1 Project Location and Description

The Project Area consists of 11.6 acres of property located in Section 30 of Township 15 South, Range 14 East, San Bernardino Base and Meridian as depicted on the 1976 El Centro, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Figure 1). The Project Area is located north of Bradshaw Avenue, east of North 10th Street, and west of North 8th Street in El Centro, California. The Project Area is currently undeveloped.

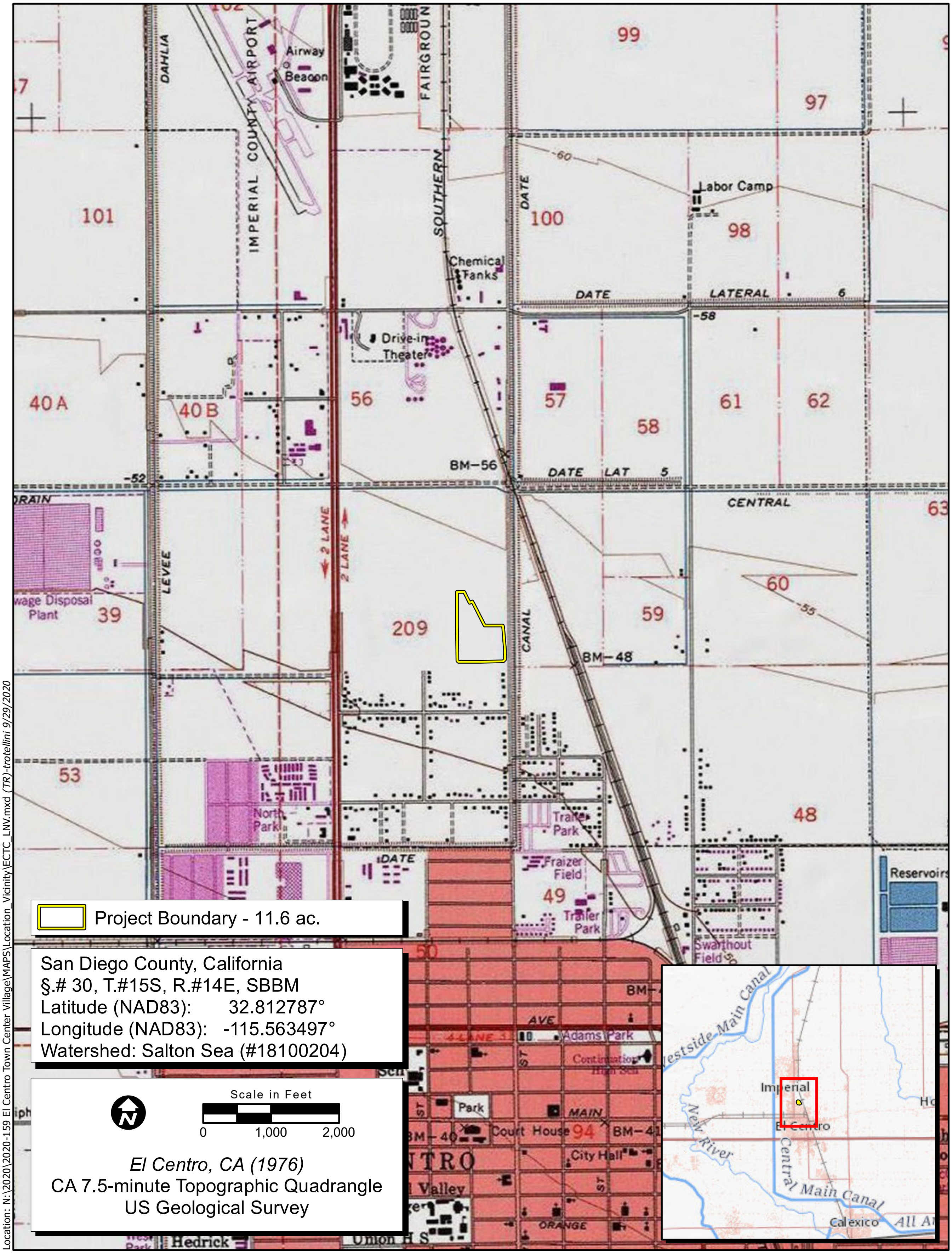
The proposed Project would result in the rezoning of two parcels located in the City of El Centro's Town Center Village from CG-General Commercial to R3-Multiple Family Residential. The project applicant is requesting the rezone to allow for future development of a 180-unit apartment complex. A General Plan Amendment is also required to change the existing General Plan land use designation from General Commercial to High Density Residential. The City of El Centro (City) will act as the lead agency for the project relative to California Environmental Quality Act (CEQA) requirements.

1.2 Area of Potential Effects

The Area of Potential Effects (APE), or Project Area, consists of the horizontal and vertical limits of a project and includes the area within which significant impacts or adverse effects to Historical Resources or Historic Properties could occur as a result of the project. The APE is defined for projects subject to regulations implementing Section 106 (federal law and regulations). For projects subject to the California Environmental Quality Act (CEQA), the term Project Area is used rather than APE. For the purpose of this document, the terms Project Area and APE are interchangeable.

The horizontal APE consists of all areas where activities associated with the Project are proposed and in the case of the current Project, equals the Project Area subject to environmental review under CEQA. This includes areas proposed for construction, vegetation removal, grading, trenching, stockpiling, staging, paving, and other elements described in the official Project description. The horizontal APE is shown on Figure 1 and also represents the survey coverage area. It measures approximately 1,060 feet in length by 730 feet in width.

Location: N:\2020\2020-159 El Centro Town Center Village\MAPS\Location_Vicinity\ECTC_LNV.mxd (TR)-trotellini 9/29/2020



Map Date: 9/29/2020

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location and Vicinity

2020-159 El Centro Town Center Village Phase IV

The vertical APE is described as the maximum depth below the surface to which excavations for project foundations and facilities will extend. Therefore, the vertical APE includes all subsurface areas where archaeological deposits could be affected. The subsurface vertical APE varies across the Project, depending on the depth of the grading or trenching for installation of facilities. This study assumes it could extend as deep as 10 feet below the current surface; therefore, review of geologic and soils maps was necessary to determine the potential for buried archaeological sites that cannot be seen on the surface.

The vertical APE also is described as the maximum height of structures that could impact the physical integrity and integrity of setting of cultural resources, including districts and traditional cultural properties. The current study assumes the above-surface vertical APE is up to 30 feet above the surface.

1.3 Regulatory Context

To meet the regulatory requirements of this Project, this cultural resources investigation was conducted pursuant to the provisions for the treatment of cultural resources contained within Section 106 of the National Historic Preservation Act (NHPA) and in CEQA (Public Resources Code [PRC] § 21000 et seq.) The goal of NHPA and CEQA is to develop and maintain a high-quality environment that serves to identify the significant environmental effects of the actions of a proposed project and to either avoid or mitigate those significant effects where feasible. CEQA pertains to all proposed projects that require State or local government agency approval, including the enactment of zoning ordinances, the issuance of conditional use permits, and the approval of development project maps. The NHPA pertains to projects that entail some degree of federal funding or permit approval.

The NHPA and CEQA (Title 14, California Code of Regulations [CCR], Article 5, § 15064.5) apply to cultural resources of the historical and pre-contact (prehistoric) periods. Any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly, is a project that may have a significant effect on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on either the California Register of Historical Resources (CRHR) (PRC § 5024.1, Title 14 CCR, § 4852) or the National Register of Historic Places (NRHP) (36 Code of Federal Regulations [CFR] 60.4). Cultural resources eligible for listing on the NRHP are considered Historic Properties under CFR 36 Part 800 and are automatically eligible for the CRHR. Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

Tribal Cultural Resources are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either included in or determined to be eligible for inclusion in the CRHR, or are included in a local register of historical resources as defined in subdivision (k) of Section 5020.1, or are 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 Section 5024.1. Section 1(b)(4) of Assembly Bill (AB) 52 established that only California Native American tribes, as defined in Section 21073 of the California PRC, are experts in the identification of Tribal Cultural Resources and impacts thereto. Because ECORP does not meet the definition of a California Native

American tribe, this report only addresses information for which ECORP is qualified to identify and evaluate, and that which is needed to inform the cultural resources section of CEQA documents. This report, therefore, does not identify or evaluate Tribal Cultural Resources. Should California Native American tribes ascribe additional importance to or interpretation of archaeological resources described herein, or provide information about non-archeological Tribal Cultural Resources, that information is documented separately in the AB 52 tribal consultation record between the tribe(s) and Lead Agency, and summarized in the Tribal Cultural Resources section of the CEQA document, if applicable.

In addition, in the event that the Project may affect Waters of the U.S., thereby requiring the Project proponent to meet the requirements of Section 404 of the Clean Water Act and obtain a permit from the U.S. Army Corps of Engineers Regulatory Division, this report was prepared to contribute to compliance with Section 106 and all implementing regulations. Moreover, because the Project may qualify as a federal undertaking, regulations (36 CFR 800) implementing Section 106 of the NHPA require that cultural resources be identified and then evaluated using NRHP eligibility criteria.

1.4 Report Organization

The following report documents the study and its findings and was prepared in conformance with the California Office of Historic Preservation's (OHP) *Archaeological Resource Management Reports: Recommended Contents and Format*. Attachment A includes a confirmation of the records search with the California Historical Resources Information System (CHRIS). Attachment B contains documentation of a search of the Sacred Lands File. Attachment C presents photographs of the Project Area.

Sections 6253, 6254, and 6254.10 of the California Code authorize State agencies to exclude archaeological site information from public disclosure under the Public Records Act. In addition, the California Public Records Act (Government Code § 6250 et seq.) and California's open meeting laws (The Brown Act, Government Code § 54950 et seq.) protect the confidentiality of Native American cultural place information. Under Exemption 3 of the federal Freedom of Information Act (5 U.S. Code [USC] 5), because the disclosure of cultural resources location information is prohibited by the Archaeological Resources Protection Act of 1979 (16 USC 470hh) and Section 307103 of the NHPA, it is also exempted from disclosure under the Freedom of Information Act. Likewise, the Information Centers of the CHRIS maintained by the OHP prohibit public dissemination of records search information. In compliance with these requirements, the results of this cultural resource investigation were prepared as a confidential document, which is not intended for public distribution in either paper or electronic format.

2.0 SETTING

2.1 Environmental Setting

The Project Area is located in the City of El Centro on flat, arid land. The immediate area is under development as part of expanding city infrastructure and residential and commercial development. The Project Area is located in the Imperial Valley of California, approximately 10.5 miles north of the Mexico-U.S. international border, 23 miles southeast of the Salton Sea, and 100 miles east of the Pacific Ocean. The Project Area is heavily disturbed due to construction activity and urban development.

2.2 Geology and Soils

Horton et al. (2017) have mapped the underlying geology of the Project Area as Quaternary alluvium and marine deposits dated to the Pliocene to Holocene (5.333 – 0 million years ago). This geologic deposit is described as alluvium, lake, playa, and terrace deposits of unconsolidated and semi-consolidated material. The Project Area lies within the boundaries of the now dry Lake Cahuilla, an ancient lake fed by waters of the Colorado River that existed periodically throughout the Pleistocene and Holocene until ultimately drying up around 400 years before present (BP).

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Web Soil Survey website (NRCS 2020), two soil types are located within the Project Area: Imperial-Glenbar silty clay loams, wet, 0 to 2 percent slopes; and Imperial silty clay, wet. These soils are classified as torrifluvents and result from fluvial deposition during flooding events in arid alluvial plains.

The potential exists for buried pre-contact archaeological sites in the Project Area due to the exploitation of lake resources by Native American communities in pre-contact times.

3.0 CULTURAL CONTEXT

3.1 Regional Pre-contact History

The archaeological history of southern California is remarkably complex, with a great deal of variation and the overlapping of specific technological and cultural traditions from the onset of documented human habitation in the terminal Pleistocene to the period of European contact in the Late Holocene. Today, archaeology and culture history are typically described according to geological epoch, with delineations in years BP between the Pleistocene (>10,000 BP), Early Holocene (10,000-6,500 BP), Middle Holocene (6,500 BP-3,500 BP) and the Late Holocene (3,500 BP to present). This approach places human history squarely in the realm of greater ecology and geological history in a way that allows discussion of human activity through time without limitations imposed by provincial labels. In California, this distinct use of geological terminology is not entirely arbitrary, as elements of technological change and diversification in cultural practices are observable at the transition of temporal periods (Erlandson and Colten 1991). However, terminology that is generally accepted by California archaeologists and the California OHP is still helpful in describing ancient patterns of human activity. The predominant archaeological patterns through time in relation to behavioral traditions and temporal periods, and in specific reference to the Project Area, are discussed below.

Little archaeological material dating to the Early and Middle Holocene is known from the Salton Trough area of the Colorado Desert. The only indications of use of this area during this long period of time consist of large bifacial dart points found on relic lake beds of Lake Cahuilla and on desert pavement. These include projectile point types common in the Mojave Desert such as Lake Mojave, Pinto, and Elko (Schaefer and Laylander 2007:249). The sparse occupation during the Middle Holocene may be related to extremely arid climatic conditions and of the lack of water in the Salton Trough (absence of Lake Cahuilla). The Salton Sea Naval Test Base study (Apple et al. 1997) has produced evidence for Archaic occupation on the west side of the Salton Trough. Pinto series and Elko series projectile points recovered during investigations at the Test Base yielded a date of 5,840 +/-250 years BP (Apple, et al 1997). These data suggest the desert area of southeastern California was not entirely abandoned during the Middle Holocene. While the population of the region was probably sparse, small bands of mobile people most likely moved among areas where water (at springs) and plant food resources were available.

A few temporary camps with living surfaces and hearths dating to the period 3,000 to 1,300 BP (Late Archaic Period) are located away from the lake bed in canyons and in the upper Coachella Valley above the maximum lake level. However, two temporary camps dating to the first millennium BC that contain fish and waterfowl bone in the Coachella Valley along the maximum Lake Cahuilla shoreline indicate there may have been a lake stand during this period (Schaefer and Laylander 2007:249).

Higher population and greater numbers of sites appear to correlate with the presence of Lake Cahuilla, which filled the Salton Trough when water flowed into the trough from the Colorado River. When water ceased to flow from the river, the lake dried, markedly reducing the availability of resources. Occupation of the Salton Trough during the Late Period (1,300 BP to Contact) correlates with three cycles of inundation and desiccation in Lake Cahuilla that occurred between AD 1200 and 1680 (Schaefer and Laylander 2007). When the lake was present, lacustrine resources such as fish, shellfish, and waterfowl were available. When the lake was absent, very few resources were available and human population was low. Lake Cahuilla was much larger than the current Salton Sea. Whereas the current Salton Sea shoreline is about -70 meters (230 feet) below sea level, the maximum Lake Cahuilla shoreline was about sea level (Schaefer and Laylander 2007:Figure 16.1). To the northwest, in the Coachella Valley, the intermittent Whitewater River entered Lake Cahuilla near Point Happy between what is now Indian Wells and Indio. Several late pre-contact archaeological sites have been investigated along the ancient Lake Cahuilla shoreline in this area. To the south, the entire Imperial Valley between East Mesa and West Mesa was underwater when Lake Cahuilla was present.

During the Late Period, the northern part of the Salton Trough (northern Salton Sea area and the Coachella Valley) was occupied by ancestors of the Takic-speaking Cahuilla (Schaefer and Laylander 2007:Figure 16.1). They also occupied the adjacent Santa Rosa and San Jacinto mountains. Large multi-seasonal residential bases were occupied along the ancient shorelines in the Coachella Valley when Lake Cahuilla was present. These sites contain abundant fish bone, waterfowl bone, and shell from freshwater shellfish. Animal and plant remains indicated use of both lowland and upland resources. Floral remains indicated use of these sites during all four seasons Cottonwood and Desert Side-Notched arrow points, along with buff ware ceramics and late pre-contact marine shell beads, indicate occupation during the Late Period (Warren 1984:407). These sites were likely occupied during the three Lake Cahuilla lake stands between AD 1200 and 1680. The final desiccation is marked by 15 episodes of fish trap construction (along 15 successively lower shorelines) as the lake receded (Warren 1984:407).

The Colorado Desert area northeast of the Salton Trough, including the Chuckwalla Valley area, was probably used intermittently prior to AD 1200 by small groups of Yuman-speaking hunter-gatherers that had residential bases or villages along the Colorado River. Sites generated by this use of the desert would consist of small temporary camps and lithic scatters. Ancestors of the Numic-speaking Chemehuevi moved into the southeastern Mojave Desert and northeastern Colorado Desert (including Chuckwalla Valley) on the west side of the Colorado River about AD 1200 (Sutton et al. 2007:244). Because the Chemehuevi did not have access to the Colorado River Valley (still occupied by Yuman speakers), their use of the desert area was more intensive. Temporary camps used by ancestors of the Chemehuevi should be larger than those dating prior to AD 1200 with a greater quantity and variety of artifacts. There should be differences between low and medium elevation camps used for general hunting and gathering and higher elevation camps used for hunting big horn sheep and deer. Lithic scatters will also likely be larger and denser compared to earlier periods. Pottery is present in some of the temporary camps and consists of either locally made brown ware or buff ware that was obtained through trade with the Colorado River groups.

The southern part of the Salton Trough was occupied by ancestors of the Yuman-speaking Tipai, Kumeyaay, or Kamia (Schaefer and Laylander 2007:Figure 16.1). This area included the Imperial Valley, the Yuha Desert, and the mountains to the west and east. The lower Colorado River area was occupied by ancestors of the Yuman-speaking Quechan. Late Prehistoric archaeological sites in this area belong to the Patayan pattern characterized by use of the bow and arrow and ceramics. Patayan I begins about 1,300 BP with the introduction of the bow and arrow, indicated archaeologically by the presence of small projectile points (arrow points) and, along the Colorado River, by the appearance of ceramics. Patayan ceramics first appeared about 1,200 BP on the east shore of Lake Cahuilla and were probably introduced by Yuman people from the Colorado River. Elsewhere, in the southern Salton Trough area, ceramics first appear about 1,000 BP at the beginning of Patayan II. Patayan I ceramics along the Colorado River include Black Mesa Buff and Colorado Beige. Later Patayan II (AD 1000 – 1700) and III (AD 1700 – 1850) ceramics include Tumco Buff and Colorado Buff. There is also a Salton Brown ware that is transitional between the valley buff wares and the Tizon Brown ware of the Peninsular Ranges to the west (Schaefer and Laylander 2007:252).

The Colorado River Yumans practiced horticulture beginning in Patayan I. Domesticates including corn and squash probably came from the Hohokam area of Arizona or from northern Mexico. At the time of European contact the Imperial Valley Yumans were practicing floodplain agriculture using small dams and ditches along the New and Alamo Rivers. Horticulture in the Imperial Valley probably began after the last recession of Lake Cahuilla during Patayan III using domesticates obtained from the Colorado River Yumans (Schaefer and Laylander 2007:253).

Along the lower Colorado River, the Patayan settlement-subsistence system consisted of horticulture, hunting, and gathering in riparian habitats. People lived in multi-seasonal residential bases along the river. When Lake Cahuilla was present in the Salton Trough, they also occupied temporary camps for fishing, hunting, and gathering on the eastern shore of Lake Cahuilla. On the west side of the Salton Trough, the Patayan pattern consisted of a seasonal round among upland and lowland habitats. When Lake Cahuilla was present, seasonal residential bases and temporary camps were occupied on the western shore of Lake Cahuilla in order to obtain lacustrine resources including fish, shellfish, and waterfowl (Schaefer and Laylander 2007:253).

Obsidian from the Obsidian Butte source on the southeast margin of the Salton Sea was used for making flaked stone tools throughout southern California during the Late Period. However, obsidian from Obsidian Butte could only be obtained when lake levels were low, since it is at an elevation of -40 meters (130 feet below sea level). It is possible that the Imperial Valley Yumans traded obsidian for food resources from other groups when lacustrine resources from Lake Cahuilla were not available. Exchange patterns are also indicated by the presence of numerous marine shell beads (made in the coastal Chumash area) in late pre-contact Takic-speaking Cahuilla sites, but not in Yuman-speaking areas (Schaefer and Laylander 2007:255).

3.2 Ethnohistory

The Kumeyaay (also known as Ipai and Tipai) are the Yuman-speaking native people of central and southwestern Imperial County, central and southern San Diego County, and the northern Baja Peninsula in Mexico. Spanish missionaries and settlers used the collective term Diegueño for these people, which referred to people living near the presidio and mission of San Diego de Alcalá. Today, these people refer to themselves as Kumeyaay or as Ipai and Tipai, which are northern and southern subgroups of Kumeyaay language speakers, respectively (Luomala 1978). The ancestral lands of the Kumeyaay extend north from Todos Santos Bay near Ensenada, Mexico to Agua Hedionda Lagoon in north San Diego County, and east to the Imperial Valley.

The primary source of Kumeyaay subsistence was vegetal food. Seasonal travel followed the ripening of plants from the lowlands to higher elevations of the mountain slopes. Acorns, grass and sage seeds, cactus fruits, wild plums, pinyon nuts, and agave stalks were the principal plant foods. Women sometimes transplanted wild onion and tobacco plants to convenient locations and sowed wild tobacco seeds. Deer, rabbits, small rodents, and birds provided meat. Village locations were selected for seasonal use and were occupied by exogamous, patrilineal clans or bands. Three or four clans might winter together, then disperse into smaller bands during the spring and summer (Luomala 1978).

The Kumeyaay were loosely organized into exogamous patrilineal groups termed sibs, clans, gens, and tribelets by ethnographers. The Kumeyaay term was cimul. The cimul used certain areas for hunting and gathering, but apparently did not control a bounded and defended territory, as did the Luiseño and Cahuilla. In addition, members of several different cimul usually lived in the same residential base, unlike the Luiseño, where a single party or clan controlled a village and its territory. Kumeyaay lived in residential bases during the winter and subsisted on stored resources. No permanent houses were built. Brush shelters were temporary and were not reused the next year. Ceremonies, including rites of passage and ceremonies to ensure an abundance of food, were held in the winter residential bases. The cimul leader directed the ceremonies and settled disputes (Christenson 1990:58, 62). One of the most important ceremonies was the mourning ceremony. Upon death, the Kumeyaay cremated the body of the deceased. Ashes were placed in a ceramic urn and buried or hidden in a cluster of rocks. The family customarily held a mourning ceremony one year after the death of a family member. During this ceremony, the clothes of the deceased individual were burned to ensure that the spirit would not return for his or her possessions (Gifford 1931; Luomala 1978).

The Kumeyaay were geographically and linguistically divided into western and eastern Kumeyaay. The western and eastern Kumeyaay spoke two different dialects (Christenson 1990:64). The western Kumeyaay lived along the coast and in the valleys along the drainages west of the mountains. The eastern Kumeyaay lived in the canyons and desert east of the mountains. The western Kumeyaay spent the winter in residential bases in the lowland valleys and then broke into smaller cimul groups that moved gradually eastward toward the mountains, following ripening plants and occupying temporary residential bases along the way. Thus, each group occupied several different residential bases during the course of a year (Christenson 1990:292-293). The eastern Kumeyaay spent the winter in villages on the desert margin where water was available from springs at canyon mouths. They moved up the canyons toward the mountains during spring and summer. The eastern and western Kumeyaay met in the mountains in the fall where they gathered black oak acorns, traded, and held ceremonies (Christenson 1990:63). The large residential bases in the mountains appear archaeologically to be village sites (Gross and Sampson 1990).

The Kumeyaay population was estimated to be between 10,000 and 20,000 at the time of European contact, based on Spanish accounts and ethnographies (Gallegos 2002). Beginning in 1775, the semi-nomadic life of the Kumeyaay began to change as a result of contact with Euro-Americans, particularly from the influence of the Spanish missions. Through successive Spanish, Mexican, and Anglo-American control, the Kumeyaay were forced to adopt a sedentary lifestyle and accept Christianity (Luomala 1978).

3.3 Regional History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978). Vizcaíno also named San Diego Bay to commemorate Saint Didacus. San Diego began to appear on European maps of the New World by 1624 (Gudde 1998:332).

In 1769, stimulated by Russian and English encroachment on the northwest Pacific Coast, Spain began to establish a series of missions and presidios along the coastal plains of Alta California that eventually stretched from San Diego to San Francisco. Transporting supplies, soldiers, and colonists to the new outposts by ship was expensive and became more time-consuming as the frontier extended northward. This provided the incentive to find an overland route across the Colorado Desert, and led to the first European crossing of what is now called Imperial Valley and the Salton Sink (Bannon 1974; Pourade 1971).

In September of 1771, Father Francisco Garcés followed the Gila River west to its confluence with the Colorado River, traveled south to the Laguna de Salada in Baja California, then turned northwest until he reached the southern end of Imperial Valley. Looking across the desert to the northwest, Garcés and his party were the first Europeans to see the Salton Sink region. After his return to Mexico, Garcés talked of his discovery to Captain Juan Bautista de Anza, the commander of the Spanish presidio at Tubac in what is now southern Arizona. Anza wrote to the Viceroy of Mexico, Antonio María Bucareli Ursúa, and received permission to mount an expedition to cross the Colorado River into California (Bannon 1974; Dowd 1960; Hoyt 1948; Pourade 1971).

On January 9, 1774, Anza left Tubac accompanied by Father Garcés and an exploratory party of 32 men. After about a month, the Anza expedition crossed the Colorado River near Yuma, entering the Colorado Desert. Rather than crossing or skirting the extensive sand dunes that lie west of Yuma, Anza followed the river south into Baja California, then turned north. After about three weeks of hardship, the expedition reached Imperial Valley west of the future site of Calexico. After crossing Borrego Valley and the Santa Rosa Mountains, Anza and his men reached Mission San Gabriel in Los Angeles on March 22, 1774, having become the first Europeans to cross the Colorado Desert and what would later be known as Imperial Valley (Bannon 1974; Dowd 1960; Hoyt 1948; Pourade 1971).

A few crossings of the Colorado Desert and Imperial Valley by Anglo-Americans took place in the early nineteenth century, but the first formal record of the region made by an American was that of Lieutenant-Colonel W. H. Emory, who traveled what was known as the Southern Route from Yuma, through the southern portion of Imperial Valley and the Salton Sink, to San Diego in 1846. The following year, Emory accompanied General Stephen W. Kearny's American Army of the West expedition over the same route. In 1848, the Mormon Battalion followed the Southern Route and established the first wagon road (Cory 1915; Dowd 1960; Duke 1974; Fitch 1961; Morton 1977; Pourade 1971). During the gold rush of the late 1840s and early 1850s, thousands of prospectors and other immigrants came to California by the Southern Route. Semi-weekly stage service by the Butterfield Overland Mail Company, crossing Imperial Valley from Yuma to San Diego and turning north to Los Angeles, was begun along this route in 1858 (Dowd 1960; Fitch 1961).

The first proposal to irrigate the Colorado Desert for agriculture came from Dr. Oliver M. Wozencraft after he saw Indians cultivating plots during an exploratory trip in May of 1849. It was 10 years, however, before Wozencraft secured the rights to 1,600 square miles of desert land in the Salton Sink from the California Legislature. Wozencraft proposed a canal system and sought funding from the U.S. Congress, but he died in 1887, never having realized his dream of turning the Salton Sink into an agricultural region (Athens 2007a; Cory 1915; De Stanley 1966; Fitch 1961; Harris 1956-58; Kennan 1917; Nordland 1977; Simon 2007a).

In 1891, the Colorado River Irrigation Company was formed, with engineer Charles R. Rockwood directing operations. In 1896, Rockwood formed the California Development Company. Canadian capitalist George Chaffey, the founder of Ontario, California, signed a contract to provide funding and promotion for the company in 1900. By 1902, the Central Main Canal (Imperial Canal) had been built and water began flowing from the Colorado River just south of the U.S.-Mexico border, via the Alamo River, to the canal. Irrigation of the Imperial Valley had begun (Cory 1915; Dowd 1960; Fitch 1961; Hartshorn 1977; Kennan 1917; Simon 2007a).

Agricultural development of the sink as a result of irrigation and real estate promotion by Chaffey and the California Development Company exceeded expectations. To attract settlers, Chaffey avoided use of the terms "desert" and "sink," and he, along with businessman Leroy Holt, named the area Imperial Valley. The towns of Imperial, Mexicali, Calexico, Heber, and Brawley were formed as part of the development associated with the canal. The population of 2,000 in 1902 grew to 7,000 by 1903 and to more than 10,000 by 1904. From little or no cultivation in 1900, agriculture in the Salton Sink grew to 120,000 acres under cultivation by January of 1905 (Fitch 1961; Kennan 1917).

During the winter of 1904-1905, greater than usual rainfall in the watershed area of the Gila River caused a high rate of discharge into the Colorado River. In February of 1905, flooding resulted in the clogging of canal intake systems with a disproportionate amount of silt. Four more floods in quick succession destroyed temporary dams and increased the silting. The Alamo River-Imperial Canal system overflowed, and the entire discharge of the Colorado River began to pour into the Salton Sink, marking the creation of the Salton Sea. After many attempts to stem the flooding with dams, levees, and artificial sand bars, the Southern Pacific Railroad built a spur line to the break in the Colorado River and diverted most of its freight cars to bring rock, gravel, logs, and clay from as far away as Louisiana. Two 1,100-foot-long trestle-and-rock dams finally stopped the flow of water into the Salton Sink in February of 1907, two years after it had begun (Cory 1915; Duke 1974; Fitch 1961; Kennan 1917; Simon 2007b; Woerner 1989).

With the increasing acreage under irrigation and cultivation, and the Southern Pacific Railroad reaching southward all the way through Imperial and El Centro to Calexico, the population of Imperial Valley and the region surrounding it had grown to around 20,000 by 1907. Prominent Valley citizens, weary of being governed from San Diego, more than 100 miles distant across the desert and mountains, were also fearful that much of their recently acquired irrigation water would be siphoned off to the coast. In July of 1907, they presented a petition to the San Diego County Board of Supervisors urging division of the county roughly into two halves, with the eastern half becoming a new county. The supervisors quickly called for an election to decide the matter, which was held on August 6. When all of the votes were finally counted on August 12, 1907, Imperial County had been created (Farr 1918; Lusk 2007). Although Imperial was the first city to be established and incorporated in the region, El Centro was chosen by election to be the county seat later that year after three weeks of heated debate (Harris 1956-58; Larson n.d.; Lusk 2007).

After the flooding of the Salton Sea was brought under control in early 1907, agricultural development resumed in Imperial Valley. The Imperial Irrigation District (IID) was established in July of 1911, covering an area of 817 square miles, the largest irrigation district in the world at that time. In June of 1916, the IID purchased the canal system built by the California Development Company. Today, the IID provides water for 6,471 square miles in Imperial Valley and is the most extensive irrigation district in the U.S. (Cory 1915; Fitch 1961; Hartshorn 1977; Imperial County Historical Society n.d.; Imperial Irrigation District 1998; Woerner 1989).

Imperial, located just north of the county seat (El Centro), was originally a base camp for prospectors seeking gold in the mountains of the eastern Imperial Valley. By 1900, successful irrigation had changed the focus of attention in the region to agriculture, and a townsite called Imperial City was surveyed by the Imperial Land Company in the center of the irrigated land. In 1902, the townsite was declared open and lots went on sale. Within a couple of years, Imperial had the first bank, church, school, brick building, drug store, grocery store, hotel, and blacksmith shop in Imperial Valley. The Imperial Valley Lumber Company was among those firsts in the region. Like several other communities in Imperial Valley, the early growth of Imperial was boosted and supported by the enthusiastic business promotions of the Holt brothers, W. F. and Leroy. Among other accomplishments, the Holts strung the first telephone line to the settlement, in 1903 (Farr 1918; Fitch 1961; Harris 1956-58; Larson n.d.; Pepper 1973).

Imperial had the earliest incorporation of any city in Imperial Valley, dating to 1904. On March 3, an election was held to decide the matter of incorporation. Although the community had between 700 and 800 residents, only 37 citizens voted. The San Diego County Board of Supervisors declared the election null, but soon a petition was circulated by the Imperial Chamber of Commerce calling for another vote. On June 30, the second election took place, and incorporation was approved by a vote of 82 to 7. Incorporation documents for the City of Imperial were filed with the county on July 12, 1904 (Harris 1956-58).

Agriculture, dairy farming, and cattle raising have been the economic staples of Imperial Valley since the early twentieth century. Although the Great Depression of the 1930s brought hardships to the area, it also brought many agricultural workers from the Oklahoma dust bowl who became permanent residents. The completion of Boulder (Hoover) Dam on the Colorado River in 1935, and the All-American Canal from the river to Imperial Valley in 1940, increased and secured the region's irrigation water supply, solidifying the valley's economy (Athens 2007b; Hartshorn 1977; Simon 2007c).

3.4 Local History

The Project Area is located in El Centro, the present-day seat of Imperial County and the largest city in the Imperial Valley. W.F. Holt and C. A. Barker purchased the land on which El Centro now stands in 1906. The cost was about $40 an acre. Most of it was barley fields. They invested $100,000 in improvements. The City of El Centro was incorporated on April 16, 1908. By 1910, the population had reached 1,610, with a population increase to 5,645 by 1920. Rapid growth was fueled in part by competition with other cities in the County. John D. Spreckels designed a railroad that snaked through the mountains of San Diego, into Mexico, tying into the Transcontinental Southern Pacific rail line at El Centro. This line, sometimes referred to as the "Impossible Railroad" due to the engineering challenge of building it, provided El Centro with direct access to San Diego seaports. Spanning 148 miles, it was completed in 1919 (San Diego History Center 2020).

By the 1940s, El Centro had a population of 11,000 people, making it the second largest city in the Imperial Valley. It had also become the principal wholesale center and the location of the Imperial Irrigation District administration offices. The strategic location of El Centro near rail lines, Interstate 80, and State Route 99 allowed El Centro to become the shipping center for vegetables in the south end of the valley. Principle industries included fruit and vegetable packing, shipping, ice plants, a flax fiber plant, box factories, and concrete pipe and brickyards (City of El Centro 2020).

Today, El Centro is a fast-growing community that serves as a connection point between the coastal cities of San Diego County and the inland deserts of California and Arizona. Agriculture still plays a role in the local economy, with an increasing diversity of businesses and residential development projects in response to regional population growth.

4.0 METHODS

4.1 Personnel Qualifications

All phases of the cultural resources investigation were conducted or supervised by Registered Professional Archaeologist (RPA) John O'Connor, Ph.D., who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. Dr. O'Connor requested and reviewed the CHRIS records search results and Native American Heritage Commission (NAHC) Sacred Lands File results, conducted the fieldwork, and prepared the report. Lisa Westwood, RPA, provided technical report review and quality assurance.

John O'Connor, Ph.D., RPA, has over 11 years of archaeological experience in North America and the Pacific Islands, experience that includes cultural resources management, academic research, museum collections management, and university teaching. Dr. O'Connor meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology. He is well versed in the evaluation of impacts to cultural resources for CEQA and NHPA projects, and he has written or otherwise contributed to numerous environmental compliance documents. Dr. O'Connor serves as the Southern California Cultural Resources Manager for ECORP.

Lisa Westwood is an RPA who meets the Secretary of the Interior's Professional Qualifications Standards for prehistoric and historic archaeology with 26 years of experience. She holds a B.A. in Anthropology and an M.A. in Anthropology (Archaeology). She is the Director of Cultural Resources for ECORP.

4.2 Records Search Methods

ECORP requested a records search for the property at the South Coastal Information Center (SCIC) of the CHRIS at San Diego State University on October 2, 2020 (Attachment A). The purpose of the records search was to determine the extent of previous surveys within a one-mile (1,600-meter) radius of the proposed Project location, and whether previously documented pre-contact or historic-period archaeological sites, architectural resources, or traditional cultural properties exist within this area.

In addition to the official records and maps for archaeological sites and surveys in Imperial County, the following historic references were also reviewed: Historic Addresses Database (OHP 2020); *The National Register Information System* (National Park Service [NPS] 2020); *Office of Historic Preservation, California Historical Landmarks* (OHP 2020); *California Historical Landmarks* (OHP 1996 and updates); *California Points of Historical Interest* (OHP 1992 and updates); *Directory of Properties in the Historical Resources Inventory* (1999); *Caltrans Local Bridge Survey* (Caltrans 2019); and *Caltrans State Bridge Survey* (Caltrans 2018).

Historic maps reviewed include:

- 1936-1955-1964 O.V. Blackburn's Map of Imperial Valley California (1:50,000 scale);
- 1940 USGS Brawley, California 15-minute series topographic quadrangle map (1:62,500 scale);
- 1957 USGS El Centro, California 7.5-minute series topographic quadrangle map (1:24,000 scale); and
- 1979 USGS El Centro, California 7.5-minute series topographic quadrangle map (1:24,000 scale); and

Aerial photographs taken in 1953, 1996, 2002, 2005, 2009, 2010, 2012, 2014, and 2016 to present were reviewed for any indications of property usage and built environment (NETROnline 2020). Topographic maps from 1955, 1958, 1961, 1973, 1980, 2012, 2015, and 2018 were also reviewed for information.

4.3 Sacred Lands File Coordination Methods

In addition to the record search, ECORP contacted the California NAHC on October 1, 2020 to request a search of the Sacred Lands File for the APE (Attachment B). This search will determine whether or not Sacred Lands have been recorded by California Native American tribes within the APE, because the Sacred

Lands File is populated by members of the Native American community who have knowledge about the locations of tribal resources. In requesting a search of the Sacred Lands File, ECORP solicited information from the Native American community regarding tribal cultural resources, but the responsibility to formally consult with the Native American community lies exclusively with the federal and local agencies under applicable State and federal law. ECORP was not delegated authority by the Lead Agency to conduct tribal consultation.

4.4 Field Methods

On October 14, 2020, ECORP subjected the 11.6-acre Project Area to a pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983). The entire Project Area is currently undeveloped. However, the Project Area has been graded, construction materials are present, and fill has been imported and piled in the center of the Project Area. No unmodified native surface was apparent during the survey. ECORP expended one-quarter of one person-day in the field. At that time, exposed ground surfaces were examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collections were undertaken during the pedestrian survey.

5.0 RESULTS

5.1 Records Search

The results of the CHRIS records search were received by ECORP on October 12, 2020 (Attachment A). The records search consisted of a review of previous research and literature, records on file with the SCIC for previously recorded resources, and historical aerial photographs and maps of the vicinity.

5.1.1 Previous Research

Twenty-eight previous cultural resource investigations have been conducted within one mile of the Project Area between 1977 and 2018. No previous cultural resources investigations overlap the Project Area, and the records search indicates that the Project Area has not been previously surveyed as part of a cultural resources technical study. A list of previous cultural resource investigations identified during this records search may be found in Attachment A.

The CHRIS records search also determined that three previously recorded cultural resources are located within one mile of the Project Area (Table 1). Previously recorded resources are comprised of two historic-period railroad segments and one historic-period road. No previously recorded resources are located within the Project Area. Details of all three previously recorded resources are included in Table 1.

Table 1. Previously Recorded Cultural Resources In or Within One Mile of the Project Area					
Primary Number P-13-	**Site Number CA-IMP-**	**Recorder and Year**	**Age/ Period**	**Site Description**	**Within Project Area?**
008682	8166H	K. Collins, J. M. Pflaum, IVC Museum (2009); C. Ehringer (2011)	Historic	Segment of Niland to Calexico Railroad (1902-1904), Southern Pacific Company	No
009302	8489H	J. A. McKenna (2007); M. Dalope, S. Gunderman (2009); AECOM (2011); J. Krintz (2011)	Historic	Segment of San Diego & Arizona Eastern Railroad (1907-1917)	No
014314		W. Jones, B. Rockhold (2012)	Historic	Segment of Villa Road	No

The National Register Information System (NPS 2020) did not list any eligible or listed properties within the Project Area or one-mile vicinity. Additionally, no resources were identified as listed as *California Historical Landmarks* (OHP 1996) and by the OHP (OHP 2020).

A search of historic General Land Office land patent records revealed no historic-period resources in the Project Area or one-mile search radius (Bureau of Land Management [BLM] 2020. The Caltrans Bridge Local and State Inventories (Caltrans 2018, 2019) does not list any historic bridges in the Project Area.

5.1.2 Map Review and Aerial Photographs

The review of historical aerial photographs and maps of the Project Area provide information on the past land uses of the property and potential for buried archaeological sites. Based on this information, the property was in use as agricultural land as recent as 1953. However, no structures or other development of the land is documented to have occurred in the past. The land appears as barren dirt in photographs from 1996 to 2016, as it exists today. Following is a summary of the review of historical maps and photographs.

- The compiled 1936-1955-1964 O.V. Blackburn's Map of Imperial Valley California (1:50,000 scale) is a patchwork of land claims overlaid with gradual development of El Centro and the surrounding area. The ownership or use identification of the Project Area is illegible in the map, but no development is shown on the property.
- The 1940 USGS Brawley, California 15-minute series topographic quadrangle map (1:62,500 scale) depicts the Project Area as undeveloped with limited urban and rural development to the south of the Project Area in El Centro and to the north of the Project Area in the City of Imperial.
- 1957 USGS El Centro, California 7.5-minute series topographic quadrangle map (1:24,000 scale) shows the Project Area as undeveloped, with limited rural development existing to the south of the Project Area.

- 1979 USGS El Centro, California 7.5-minute series topographic quadrangle map (1:24,000 scale) shows the Project Area as undeveloped and in a nearly identical state as the 1957 map discussed above. Increased urban and suburban development is apparent to the south of the Project Area.
- An aerial photograph from 1953 shows the project area as agricultural land, with crops visible in the photograph. The project Area appears to be part of a larger agricultural operation that extends to the west and the north of the property under study.
- Aerial photographs taken from 1996 to present reveals the Project Area as it appears today.

In summary, the property has transitioned from agricultural to undeveloped land in the historic period. The property has undergone agricultural modification, tilling, and grading in past decades. There is no evidence of structures or historic-period resources existing on the land.

5.2 Sacred Lands File Results

The results of the Sacred Lands File search by the NAHC were received on October 7, 2020. The search of the Sacred Lands File failed to indicate the presence of Native American cultural resources in the Project Area. A record of all correspondence is provided in Attachment B.

5.3 Field Survey Results

ECORP surveyed the 11.6-acre Project Area on October 14, 2020. The Project Area consists of an open dirt lot that has been graded in preparation for development. Imported fill, construction materials, and modern debris and trash are scattered throughout the Project Area (Figures 2 through 4). The pedestrian survey was conducted by walking east-to-west transects across all accessible portions of the property and examining both permeable and impermeable surfaces throughout. The Project Area is located to the east of recently developed multi-unit residential properties, but no permanent structures or development has occurred on the Project property. Overall, the visibility throughout open areas of the Project Area was good (approximately 90 to 100 percent). Visible soil is all imported fill or highly disturbed local material that has been graded or transported throughout the Project Area.

No cultural resources were found as a result of the field survey.

Figure 2. Overview from northwestern corner of Project Area (view southeast; October 14, 2020).

Figure 3. Overview from southwestern corner of Project Area (view northeast; October 14, 2020).

Figure 4. Construction materials (view south-southwest; October 14, 2020).

6.0 MANAGEMENT CONSIDERATIONS

6.1 Conclusions

ECORP conducted a cultural resources inventory consisting of a CHRIS records search, a search of the Sacred Lands File by the NAHC, and a field survey. No previously recorded cultural resources were identified in the Project Area by the CHRIS records search. No sacred lands were identified during the NAHC search of the Sacred Lands File. No pre-contact or historic-period cultural resources were identified during the field survey. Based on these findings, the proposed Project will not disturb any known Historical Resources as defined under CEQA or Historic Properties as defined by Section 106 NHPA. No ground disturbance should occur until the lead agencies concur with this finding.

6.2 Likelihood for Subsurface Cultural Resources

The CHRIS records search results revealed three historic-period resources, the closest being a segment of the Niland to Calexico Railroad (P-13-008682) located approximately 0.15 mile east of the Project Area. Surface sediments in the Project Area consist of Holocene surficial sediments in which regional pre-contact archaeological deposits have been previously identified and documented. Though no pre-contact cultural resources have been previously recorded in the Project Area or its one-mile vicinity, the potential for subsurface cultural deposits still exists due to the presence of sediments contemporaneous with human occupation of the region, and the location of the Project Area within the dry lakebed of ancient Lake Cahuilla. Post-review discovery procedures are outlined below.

The City, at its discretion, may elect to require archaeological and Native American monitoring for any ground disturbance in native soils that may occur as part of the proposed Project so that any discoveries can be managed in accordance with State law as quickly as possible and without undue damage. In any case, the Lead Agency will require that any unanticipated (or post-review) discoveries found during Project construction be managed through a procedure designed to assess and treat the find as quickly as possible and in accordance with applicable State and federal law.

6.3 Recommended Mitigation Measures

6.3.1 Post-Review Discovery Procedures

If subsurface deposits believed to be cultural or human in origin are discovered during construction, all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeology, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, work may resume immediately and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, he or she shall immediately notify the City and the landowner. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures if the find is determined to be a Historical Resource under CEQA, as defined in Section 15064.5(a) of the CEQA Guidelines, or a Historic Property, as defined in 36 CFR 60.4. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not a Historical Resource under CEQA or a Historic Property under Section 106; or 2) that the treatment measures have been completed to their satisfaction.
- If the find includes human remains, or remains that are potentially human, he or she shall ensure reasonable protection measures are taken to protect the discovery from disturbance (AB 2641). The archaeologist shall notify the Imperial County Coroner (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project (§ 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC may mediate (§ 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through

consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

The Lead Agency is responsible for ensuring compliance with these mitigation measures because damage to significant cultural resources is in violation of CEQA and Section 106. Section 15097 of Title 14, Chapter 3, Article 7 of CEQA, *Mitigation Monitoring or Reporting*, "the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. A public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program."

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LIST OF ATTACHMENTS

Attachment A – Records Search Confirmation

Attachment B – Sacred Lands File Coordination

Attachment C – Project Area Photographs

ATTACHMENT A

Records Search Confirmation

South Coastal Information Center
San Diego State University
5500 Campanile Drive
San Diego, CA 92182-5320
Office: (619) 594-5682
www.scic.org
nick@scic.org

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORDS SEARCH

Company: ECORP Consulting, Inc.

Company Representative: John O'Connor

Date Processed: 10/12/2020

Project Identification: El Centro Town Center Project

Search Radius: 1 mile

Historical Resources: JL

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: JL

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: JL

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: JL

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Summary of SHRC Approved CHRIS IC Records Search Elements	
RSID:	2784
RUSH:	yes
Hours:	1
Spatial Features:	33
Address-Mapped Shapes:	no
Digital Database Records:	32
Quads:	1
Aerial Photos:	0
PDFs:	Yes
PDF Pages:	105

This is not an invoice. Please pay from the monthly billing statement

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
IM-00131	NADB-R - 1100131; Voided - VONWEJ81	1977	VON WERLHOF, JAY	ARCHAEOLOGICAL EXAMINATIONS OF A PROPOSED MODIFICATION OF CLARK ROAD, IMPERIAL COUNTY	IMPERIAL VALLEY COLLEGE MUSEUM	
IM-00145	NADB-R - 1100145; Voided - IVCM04	1978	IMPERIAL VALLEY COLLEGE MUSEUM	IMPERIAL COUNTY STATEMENT OF ARCHAEOLOGICAL CLEARANCE	IMPERIAL VALLEY COLLEGE MUSEUM	
IM-00178	NADB-R - 1100178; Voided - VONWEJ103	1979	VON WERLHOF, JAY and SHERILEE VON WERLHOF	ARCHAEOLOGICAL INVESTIGATIONS OF A PROPOSED EAST-WEST RUNWAY, IMPERIAL COUNTY AIRPORT	IMPERIAL VALLEY COLLEGE MUSEUM	
IM-00182	NADB-R - 1100182; Voided - HSAPS01	1979	HODGES & SHUTT AVIATION PLANNING SERVICES	DRAFT ENVIRONMENTAL IMPACT REPORT FOR CROSSWIND RUNWAY PROJECT, IMPERIAL COUNTY AIRPORT	HODGES & SHUTT AVIATION PLANNING SERVICES	
IM-00264	NADB-R - 1100264; Voided - STUARB01	1982	STUART, BOB	DRAFT ENVIRONMENTAL IMPACT REPORT CURRENT LAND USE PLAN IMPERIAL PLANNING UNIT	IMPERIAL COUNTY PLANNING DEPARTMENT	
IM-00266	NADB-R - 1100266; Voided - STUARB02	1982	STUART, BOB	DRAFT ENVIRONMENTAL IMPACT REPORT AIRPORT LAND USE PLAN	IMPERIAL COUNTY PLANNING DEPARTMENT	
IM-00716	NADB-R - 1100716; Voided - VONWEJ184	1999	VON WERLHOF, JAY	ARCHAEOLOGICAL EXAMINATIONS OF PROPERTY THAT CITY OF IMPERIAL PLANS FOR WATER AND SEWAGE FACILITIES	JAY VON WERLHOF	
IM-00719	NADB-R - 1100719; Voided - HOHMAJ01	1999	HOHMANN, JOHN W.	A PHASE I (CLASS III) ARCHAEOLOGICAL SURVEY OF 40 ACRES FOR A PROPOSED US BORDER PATROL FACILITY, IMPERIAL COUNTY, CALIFORNIA	THE CULTURAL RESOURCE GROUP	
IM-00731	NADB-R - 1100731; Voided - PEAK02	1989	PEAK & ASSOCIATES	CULTURAL RESOURCE SURVEY AND CLEARANCE - SALTON SEA RADIO SITE TO CALEXICO, IMPERIAL COUNTY, CALIFORNIA. AMERICAN TELEPHONE AND TELEGRAPH COMPANY'S FIBEROPTIC COMMUNICATION CABLE	PEAK & ASSOCIATES	
IM-00785	NADB-R - 1100785; Voided - IVM01	1997	IMPERIAL VALLEY MUSEUM	HISTORIC PROPETY SURVEY FOR F.A.S. #Y666 (2) ATEN ROAD, IMPERIAL COUNTY	IMPERIAL VALLEY MUSEUM	
IM-00798	NADB-R - 1100798; Voided - VONWEJ199	2000	VON WERLHOF, JAY	ARCHAEOLOGICAL EXAMINATIONS OF A PROPOSED DEVELOPMENT AREA IN NORTH EL CENTRO		
IM-00885	NADB-R - 1100885; Voided - VONWEJ216	2003	VON WERLHOF, JAY	ARCHAEOLOGICAL EXAMINATION OF IMPERIAL SPECIFIC PLANNED COMMUNITY		

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
IM-00886	NADB-R - 1100886; Voided - VONWEJ217	2003	VON WERLHOF, JAY	RANCHO VICTORIA SUBDIVISION		
IM-01009	NADB-R - 1101009; Voided - TANGB14	2006	TANG, BAI	HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT - THE BANK OF AMERICA PROJECT	CRM TECH	
IM-01020	NADB-R - 1101020; Voided - WLODAR15	2005	WLODARSKI, ROBERT J.	RECORDS SEARCH AND FIELD RECONNAISSANCE RESULTS FOR NEXTEL WIRELES TELECOMMUNICATIONS SITE CA-8989B (ATEN) LOCATED AT 291 ATEN ROAD, CITY OF CENTRO, IMPERIAL COUNTY, CALIFORNIA 92243	CELLULAR ARCHAEOLOGICAL RESOURCE EVALUATIONS	
IM-01091	NADB-R - 1101091; Voided - PAVLOS01	2007	PAVLOVICK, SALINA	PROPOSED TOWER RAW LAND SITE, VERTICAL SPACE/KXO RADIO, NE OF THE INTERSECTION OF CROSS ROAD AND VILLA ROAD, EL CENTRO, IMPERIAL COUNTY, CALIFORNIA	TERRANEXT	
IM-01158	NADB-R - 1101158; Voided - ACS01	1996	ARCHAEOLOGICAL CONSULTING SERVICES, LTD.	AN ARCHAEOLOGICAL ASSESSMENT OF THE NILAND-IMPERIAL PIPELINE EXPANSION CORRIDOR, IMPERIAL COUNTY, CALIFORNIA	ARCHAEOLOGICAL CONSULTING SERVICES, LTD.	13-005951
IM-01182	NADB-R - 1101182; Voided - YOSTS01	2001	YOST, STEPHEN W., MICHAEL MIRRO, LORI RHODES, J. DAVID ING, and HOWARD HIGGINS	FINAL REPORT ON CULTURAL RESOURCE MONITORING ALONG THE LEVEL (3) LONG HAUL FIBER OPTIC RUNNING LINE, SAN DIEGO, CALIFORNIA TO YUMA, ARIZONA, SAN DIEGO AND IMPERIAL COUNTIES	TRC	
IM-01205	NADB-R - 1101205; Voided - PRICEH01	2008	PRICE, HARRY J.	RESULTS OF CULTURAL RESOURCES SURVEY FOR THE SIX-ACRE 1910 WATERMAN AVENUE PROJECT, EL CENTRO, IMPERIAL COUNTY	RECON	
IM-01228	NADB-R - 1101228; Voided - SWCA02	2006	SWCA ENVIRONMENTAL CONSULTANTS	VOLUME I - CULTURAL RESOURCES FINAL REPORT OF MONITORING AND FINDINGS FOR THE QWEST NETWORK CONSTRUCTION PROJECT, STATE OF CALIFORNIA	SWCA ENVIRONMENTAL CONSULTANTS	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
IM-01242	NADB-R - 1101242; Voided - BLM53	2007	BUREAU OF LAND MANAGEMENT	FINAL ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT AND PROPOSED LAND USE PLAN AMENDMENT - VOLUME I AND II - NORTH BAJA PIPELINE EXPANSION PROJECT	BLM, ET AL.	
IM-01243	NADB-R - 1101243; Voided - BLM54	2006	BUREAU OF LAND MANAGEMENT	DRAFT ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTAL IMPACT REPORT AND DRAFT LAND USE PLAN AMENDMENT - VOLUMES I AND II - NORTH BAJA PIPELINE EXPANSION PROJECT	BLM, ET AL.	
IM-01287	NADB-R - 1101287; Voided - HRA02	2006	HISTORIC RESOURCE ASSOCIATES	CULTURAL RESOURCES STUDY OF THE TUCKER MONOPALM PROJECT, ALAMOSA PCS SITE NO. LA04AL373A, 463 WEST ATEN ROAD, IMPERIAL, IMPERIAL COUNTY, CALIFORNIA 92251	HISTORIC RESOURCE ASSOCIATES	
IM-01513	NADB-R - 1101513; Voided - JONESW01	2012	JONES, WENDY, EVELYN CHANDLER, and ROGER MASON	CULTURAL RESOURCES INVENTORY FOR THE SOL ORCHARD SOLAR FARM PROJECT IN THE CITY OF EL CENTRO, IMPERIAL COUNTY, CALIFORNIA	ECORP CONSULTING, INC.	13-014312, 13-014313
IM-01514	NADB-R - 1101514; Voided - LINDGREN01	2012	LINDGREN, KRISTINA, EVELYN CHANDLER, and ROGER MASON	CULTURAL RESOURCES EVALUATION FOR THE SOL ORCHARD SOLAR FARM PROJECT EL CENTRO, IMPERIAL COUNTY, CALIFORNIA	ECORP CONSULTING, INC.	13-014312, 13-014313
IM-01572	NADB-R - 1101572; Submitter - PROJECT NO. CYG530	2014	FULTON, PHIL	CULTURAL RESOURCE ASSESSMENT CLASS I INVENTORY VERIZON WIRELESS SERVICES ATEN FACILITY, CITY OF IMPERIAL, IMPERIAL COUNTY, CALIFORNIA	LSA ASSOCIATES, INC.	
IM-01655	NADB-R - 1101655	2016	JOHNSON, BRENT	CULTURAL RESOURCES RECORDS SEARCH FOR CLEARTALK WIRELESS EC-063 REPO/16-154782.1 467 ATEN ROAD, IMPERIAL CA 92251	Partner Engineering and Science, Inc	
IM-01737	NADB-R - 1101737	2018	HECTOR, SUSAN	CA-0051 YUCCA ST. TOWER INSTALLATION PROJECT UPDATE LETTER	NWB ENVIRONMENTAL SERVICES, LLC	

ATTACHMENT B

Sacred Lands File Coordination

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

October 7, 2020

John O'Connor
ECORP Consulting

Via Email to: joconnor@ecorpconsulting.com

Re: El Centro Town Center Project, Imperial County

Dear Mr. O'Connor:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: steven.quinn@nahc.ca.gov.

Sincerely,

Steven Quinn

Steven Quinn
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Imperial County
10/7/2020

Barona Group of the Capitan Grande
Edwin Romero, Chairperson
1095 Barona Road — Diegueno
Lakeside, CA, 92040
Phone: (619) 443 - 6612
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Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Diegueno
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Cocopah Indian Reservation
Jill McCormick, Cultural Resources Manager
14515 S. Veterans Drive — Cocopah
Sommerton, AZ, 85350
Phone: (928) 722 - 7521
mccormickj@cocopah.com

Ewiiaapaayp Band of Kumeyaay Indians
Robert Pinto, Chairperson
4054 Willows Road — Diegueno
Alpine, CA, 91901
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Fax: (619) 445-9126
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Ewiiaapaayp Band of Kumeyaay Indians
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4054 Willows Road — Diegueno
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Fax: (619) 445-9126
michaelg@leaningrock.net

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P.O. Box 507 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 803 - 5694
cjlinton73@aol.com

Iipay Nation of Santa Ysabel
Virgil Perez, Chairperson
P.O. Box 130 — Diegueno
Santa Ysabel, CA, 92070
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Fax: (760) 765-0320

Inaja-Cosmit Band of Indians
Rebecca Osuna, Chairperson
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Escondido, CA, 92025
Phone: (760) 737 - 7628
Fax: (760) 747-8568

Jamul Indian Village
Erica Pinto, Chairperson
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Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612 — Diegueno
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas,
P.O. Box 775 — Kwaaymii Diegueno
Pine Valley, CA, 91962
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La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

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 El Centro Town Center Project, Imperial County.

Native American Heritage Commission
Native American Contact List
Imperial County
10/7/2020

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Quechan Tribe of the Fort Yuma Reservation
Manfred Scott, Acting Chairman Kw'ts'an Cultural Committee
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

Quechan Tribe of the Fort Yuma Reservation
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

San Pasqual Band of Diegueno Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
johnf@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
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Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Sycuan Band of the Kumeyaay Nation
Kristie Orosco, Kumeyaay Resource Specialist
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 6917

Viejas Band of Kumeyaay Indians
John Christman, Chairperson
1 Viejas Grade Road — Diegueno
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337

Viejas Band of Kumeyaay Indians
Ernest Pingleton, Tribal Historic Officer, Resource Management
1 Viejas Grade Road
Alpine, CA, 91901
Phone: (619) 659 - 2314
epingleton@viejas-nsn.gov

Diegueno

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 El Centro Town Center Project, Imperial County.

ATTACHMENT C

Project Area Photographs

State of California ♁ Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTOGRAPH RECORD

Primary #
HRI #
Trinomial

Page 1 **of** 1 **Project Name:** El Centro Town Center Village Phase IV
Year 2020
Camera Format: Digital Lens Size:
Film Type and Speed: iphone 6 **Negatives Kept at:** ECORP Consulting, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
10	14	8:55 am	1	Overview from northwestern corner of project area	SE	img_1423
10	14	9:05 am	2	Imported fill pile with modern debris	SW	img_1424
10	14	9:10 am	3	Construction materials	SSW	img_1425
10	14	9:10 am	4	Construction trailer	NW	img_1426
10	14	9:15 am	5	Overview from eastern boundary of project area	W	Img_1427
10	14	9:25 am	6	Spoils piles	SSE	img_1428
10	14	9:35 am	7	Overview from southwestern corner of project area	NE	img_1429
10	14	9:40 am	8	Overview from southeastern corner of project area	NW	img_1430


IMG_1430


IMG_1423


IMG_1424


IMG_1425


IMG_1426


IMG_1427


IMG_1428


IMG_1429




Appendix D
Noise Impact Assessment

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Noise Impact Assessment

City of El Centro Town Center Village Project

El Centro, California

Prepared For:

Bob Stark
Michael Baker International
9755 Clairemont Mesa Blvd Suite 100
San Diego, CA 92124.

November 2020

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

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Attachment C - Federal Highway Administration Highway Roadway Construction Noise Outputs – Project Construction Noise

LIST OF ACRONYMS AND ABBREVIATIONS

CEQA	California Environmental Quality Act
CMU	Concrete Masonry Unit
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	Decibel is A-weighted
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GC	General Commercial
L_{eq}	Measure of ambient noise
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
OSHPD	Office of State Health Planning and Development
PPV	Peak particle velocity
Project	El Centro Town Center Project
R3	Multiple Family Residential
RMS	Root mean square
WEAL	Western Electro-Acoustic Laboratory, Inc.

1.0 INTRODUCTION

This report documents the results of a Noise Impact Assessment completed for the City of El Centro Town Center Village Project (Project), which includes the development of a 180-unit apartment complex in the City of El Centro, California. This assessment was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the City of El Centro General Plan Noise Element and Code of Ordinances. The purpose of this report is to estimate Project-generated noise levels and to determine the level of impact the Project would have on the environment.

1.1 Project Overview

The El Centro Town Center Village Phase IV General Plan Amendment and Rezone Project (proposed project) would result in the rezoning of two parcels located in the City of El Centro's Town Center Village from CG-General Commercial to R3-Multiple Family Residential. The project applicant is requesting the rezone to allow for future development of a 180-unit apartment complex. A General Plan Amendment is also required to change the existing General Plan land use designation from General Commercial to High Density Residential. The City of El Centro (City) will act as the lead agency for the project relative to California Environmental Quality Act (CEQA) requirements.

1.2 Project Location

The project site is located in the northernmost portion of the City of El Centro in south-central Imperial County, California. The property site is located between Cruickshank Drive to the north and Bradshaw Avenue to the south, and between N. 8th Street to the east and N. 10th Street to the west. The affected County Assessor Parcel Numbers (APNs) include APN 044-620-049 and a portion of APN 044-620-051. Regional access to the project vicinity is provided via Interstate 8 (I-8) which is located approximately 2.6 miles to the south; refer to Figure 1, Regional/Local Vicinity Map. The site is located within the boundaries of the Town Center Village Project and represents Phase IV of 4 planned phases of development.

1.3 Applicable Land Use Regulations

The project as proposed would require a General Plan Amendment to change the existing General Plan land use designation from General Commercial to High Density Residential. The project would also rezone the property from CG-General Commercial to R3-Multiple Family Residential.

Additionally, the Imperial County Airport Land Use Compatibility Plan (County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone. The Imperial County Airport Land Use Commission previously reviewed the request to rezone the subject property as proposed and found that the rezone would be inconsistent with the Imperial County Airport Land Use Compatibility Plan. However, the City retains the authority to make a final consistency determination that may ultimately preside over the Airport Land Use Commission's decision as to the appropriateness of the requested rezone.

1.4 Project Characteristics

Table 1-1, Project Summary, identifies the various components of the project. Rezoning of the property would allow for development of a 180-unit apartment complex at a density of 15.6 dwelling units per acre (du/ac).

Table 1-1. Project Summary

Apartment Summary

Unit Plan	Square Feet	Bed/Bath	# Units	Total Square Feet
Unit 1	643	1/1	60	38,580
Unit 2A	970	2/2	60	58,200
Unit 2B (2-Story)	924	2/2.5	60	55,440
Total	**--**	**--**	**180**	**152,220**

Parking Summary

Required		Provided	
1 Bedroom; 1.5 space/unit	90	Private Garages	60
2 Bedroom; 2 spaces/unit	240	Standard Parking Stalls (9'x20')	280
Guest: 0.25 spaces/unit	45	Compact Stalls (8.5'x17')	45
Total	**375**	**--**	**385**

Open Space Summary

Required		Provided	
150 SF per unit common open space (20' minimum width)	27,000	Recreation Amenity (Minus Clubhouse)	16,710
		Common Open Space & Dog Park	31,430
Total	**27,000**	**--**	**48,140**

Site Coverage

Required		Provided		
Standard	**Square Feet**	**Coverage**	**Square Feet**	**Percent**
Maximum Lot Coverage = 60%	302,000 – 304,000	Building Coverage	126,900	25%
		Roads and Parking	169,980	34%
Total			**296,880**	**59%**

1.5 Project Construction

Schedule

It is estimated that project construction would occur over a period of approximately 19 months, from initial site preparation through final construction and finishing (i.e., painting). It is anticipated that the work would be completed in 8- or 10-hour shifts, with a total of five shifts per week (Monday-Friday). Overtime and weekend work may occur as necessary to meet scheduled milestones or accelerate the schedule and would comply with all applicable California labor laws as well as local City regulations regulating construction activities.

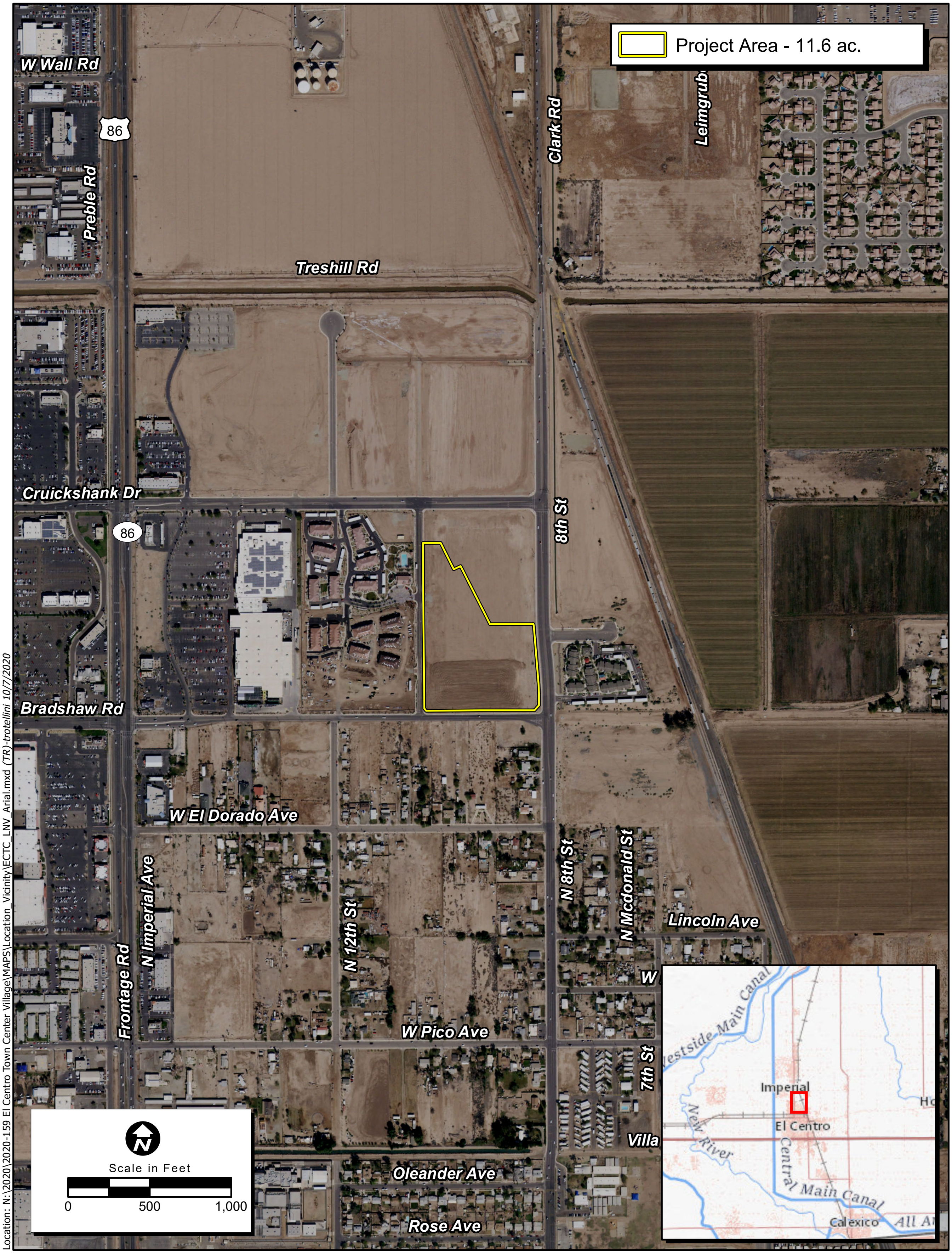

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Photo Source: NAIP (2018), Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Map Date: 10/7/2020

Figure 1. Project Location and Vicinity

2020-159 El Centro Town Center Village

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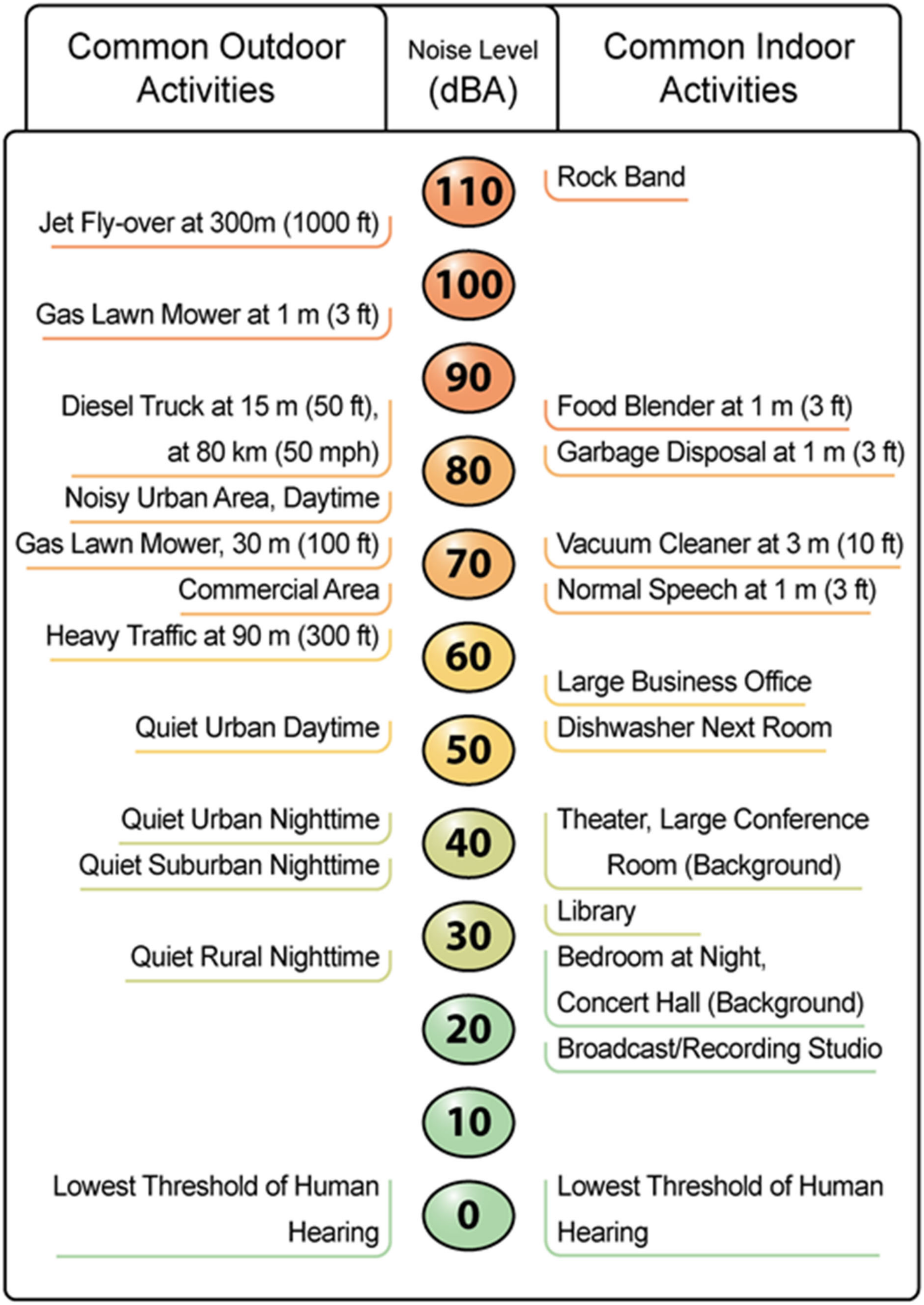
2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by three dB). Under the decibel scale, three sources of equal loudness together would produce an increase of five dB.

Typical noise levels associated with common noise sources are depicted in Figure 2. *Common Noise Levels*



Source: California Department of Transportation (Caltrans) 2012

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Figure 2 Common Noise Levels

Town Center Village

2.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately six dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately three dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. [WEAL] 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the “line of sight” between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. [HMMH] 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typically residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. (STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations.) In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

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. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined in Table 2-1.

Table 2-1. Common Acoustical Descriptors

Descriptor	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the Leq of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average Leq with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.4 dBA Ldn.
Community Noise Equivalent Level, CNEL	A 24-hour average Leq with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

The A weighted decibel sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about ±1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about ±1 to 2 dBA.

2.1.4 Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in A-weighted noise levels (dBA), the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

2.1.5 Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. For ground vehicles, a noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage. For human response, however, an average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to an average vibration amplitude, not a peak amplitude). Because the average particle velocity over time is zero, the RMS amplitude is typically used to assess human response. The RMS value is the average of the amplitude squared over time, typically a 1- sec. period (FTA 2018).

Table 2-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 2-2 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

Table 2-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: Caltrans 2020

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The project is proposing the construction of 180 multi-family residential units. The nearest existing noise-sensitive land uses to the project site are multi-family residences located to the east (across 8th Street) and west (across 10th Street) of the project site.

3.2 Existing Ambient Noise Environment

The most common and significant source of noise in the City of El Centro is mobile noise generated by transportation-related sources. Other sources of noise are the various land uses (i.e., residential, commercial and agricultural) that generate stationary-source noise. The project site is bound by vacant land to the north with Cruickshank Drive beyond, 8th Street to the east with multi-family residential units beyond, Bradshaw Avenue to the south with residential land uses beyond, and 10th Street and multi-family residential units to the west, with a commercial shopping center beyond. As shown in Table 3-1 below, the ambient recorded noise level directly adjacent to the project site ranges from 52.0 dBA to 55.7 dBA L_{eq}. As shown in Table 3-2, the existing traffic-generated noise levels in the project-vicinity, a predominate source of noise, ranges from 43.5 to 61.7 dBA CNEL

3.2.1 Existing Ambient Noise Measurements

The project site currently consists of flat undeveloped land. It is surrounded mainly by a mix of undeveloped and residential land uses. In order to quantify existing ambient noise levels in the project area, ECORP Consulting, Inc. conducted three short-term noise measurements on October 1, 2020. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site during the daytime (see Attachment A for a visual depiction of the Noise Measurement Locations). The 30-minute measurements were taken between 7:27 a.m. and 9:15 a.m. Short-term (L_{eq}) measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 3-1.

Table 3-1. Existing (Baseline) Noise Measurements					
Location Number	Location	L_{eq} dBA	L_{min} dBA	L_{max} dBA	Time
1	Corner of Bradshaw Avenue and 10th Street	**55.7**	45.7	75.6	7:27 a.m.- 7:57 a.m.
2	Residential complex on 8th Street across from project site	**61.3**	46.6	75.6	8:04 a.m. – 8:34 a.m.
3	Intersection of 10th Street and Cruickshank Drive	**52.0**	36.6	79.2	8:45 a.m. – 9:15 a.m.

Source: Measurements were taken by ECORP with an Ex Tech SDL 600 precision sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. See Attachment A for noise measurement outputs.

As shown in Table 3-1, the ambient recorded noise levels range from 52.0 to 61.3 dBA near the project site. The most common noise in the project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles). Traffic moving along streets produces a sound level that remains relatively constant and is part of the minimum ambient noise level in the project vicinity. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast-moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, trains, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

3.2.2 Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the project vicinity. This task was accomplished using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) (see Attachment B) and traffic volumes from the project's Traffic Impact Study (Michael Baker International 2020). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along these roadway segments are presented in Table 3-2.

Table 3-2. Existing (Baseline) Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway
Cruickshank Drive		
Between Imperial Avenue and 12th Street	Residential and Commercial	55.7
Between 12th Street and 10th Street	Residential and Commercial	54.7
Bradshaw Road		
West of Imperial Avenue	Residential and Commercial	55.1
Between Imperial Avenue and 12th Street	Residential and Commercial	51.8
Between 12th Street and 10th Street	Residential	50.0
Between 10th Street and 8th Street	Residential	48.2
8th Street		
Between the project site driveway and Bradshaw Road	Residential	56.1
Between Bradshaw Road and El Dorado Avenue	Residential	56.7
South of El Dorado Avenue	Residential	56.4
10th Street		
Between Cruickshank Drive and the project site Driveway	Residential	43.5
Imperial Avenue		
South of Bradshaw Road	Commercial and Religious	61.7

Source: Traffic noise levels were calculated by ECORP using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Michael Baker International (2020). Refer to Attachment B for traffic noise modeling assumptions and results.
Note: A total of 11 intersections were analyzed in the Traffic Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown, the existing traffic-generated noise levels on project-vicinity roadways currently range from 43.5 to 61.7 dBA CNEL at a distance of 100 feet from the roadway centerline. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. It should be noted that the modeled noise levels depicted in Table 3-2 may differ from measured levels in Table 3-1 because the measurements represent noise levels at different locations around the project site and are also reported in different noise metrics (e.g., noise measurements are the L_{eq} values and traffic noise levels are reported in CNEL).

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an eight-hour work shift (29 Code of Regulations 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.2 State

4.2.1 State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

4.2.2 State Office of Planning and Research Noise Element Guidelines

The State OPR Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.3 Local

4.3.1 City of El Centro General Plan Noise Element

The project site is located in the City of El Centro and therefore would potentially affect receptors within the City from onsite and offsite sources. The City Noise Element of the General Plan is a comprehensive program for including noise management in the planning process, providing a tool for planners to use in achieving and maintaining land uses that are compatible with existing and future environmental noise levels. The Noise Policy identifies noise-sensitive land uses and noise sources and defines areas of noise impact for the purpose of developing programs to ensure that residents in El Centro, and other noise-sensitive land uses, will be protected from excessive noise intrusion.

As development proposals are submitted to the City, each is evaluated with respect to the provisions in the Noise Element to ensure that noise impacts are reduced through planning and project design. Through implementation of the policies of the Noise Element, El Centro seeks to reduce or avoid adverse noise impacts for the purposes of protecting the general health, safety, and welfare of the community.

The most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations within the City that would negatively affect noise sensitive land users. Users such as schools, hospitals, child care, senior care, congregate care, churches, and all types of residential use should be located outside of any area anticipated to exceed acceptable noise levels as defined by the Land Use Compatibility Matrix, or should be protected from noise through sound attenuation measures such as site and architectural design and sound walls. The City of El Centro has adopted guidelines as a basis for planning decisions based on noise considerations. These guidelines are shown in Table 4-1. In the case that the noise levels identified at a proposed project site fall within levels considered normally acceptable, the project is considered compatible with the existing noise environment.

Table 4-1. Noise/Land Use Compatibility Matrix

Land Use	Community Noise Exposure (L_{dn} or CNEL)						
	50	55	60	65	70	75	80
Residential	NA	NA	CA	CA	NU	CU	CU
Transient Lodging- Motel, Hotel	NA	NA	CA	CA	CA	NU	CU
Schools, Libraries, Churches, Hospitals, Nursing Homes	NA	NA	CA	CA	NU	NU	CU
Auditoriums, Concert Halls, Amphitheaters	CA	CA	CA	CA	CU	CU	CU
Sports Arena, Outdoor Spectator Sports	CA	CA	CA	CA	CA	CU	CU
Playgrounds, Parks	NA	NA	NA	NA	NU	CU	CU
Gold Course, Riding Stables, Water Recreation, Cemeteries	NA	NA	NA	NA	NU	NU	CU
Office Buildings, Business Commercial, and Professional	NA	NA	NA	CA	CA	NU	NU
Industrial, Manufacturing, Utilities, Agriculture	NA	NA	NA	NA	CA	CA	NU

Source: City of El Centro 2004

Notes:

Zone A- Normally Acceptable (NA): Specific land use is satisfactory, based upon the assumption that any buildings involved meet conventional Title 24 construction standards. No special noise insulation required.

Zone B- Conditionally Acceptable (CA): New construction or development shall be undertaken only after a detailed noise analysis is made and noise reduction measures are identified and included in the project design.

Zone C- Normally Unacceptable (NU): New construction or development is discouraged. If new construction is proposed, a detailed analysis is required, noise reduction measures must be identified, and noise insulation features included in the design.

Zone D- Clearly Unacceptable (CU): New construction or development clearly should not be undertaken.

Additionally, the Noise Element contains goals and policies that must be used to guide decisions concerning land uses that are common sources of excessive noise levels. The following relevant and applicable goals from the City's Noise Element have been identified for the project:

- **Noise Goal 1**: Minimize the effect of noise through proper land use planning.

  Policy 1.1: Use noise/land use compatibility standards as a guide for the future planning and development decisions.

  Policy 1.2: Provide noise control measures and sound attenuating construction in areas of new construction or rehabilitation.

Policy 1.3: Promote alternative sound attenuation measures, such as berms, embankments, landscaping, setbacks, and architectural design where appropriate, rather than wall barriers.

Policy 1.4: Support changes in the Uniform Building Code that incorporate new technologies for reducing exterior noise intrusion into structures and the transmission of interior-generated noise within structures.

- **Noise Goal 2**: Minimize transportation related noise impacts to preserve the City's overall environment.

Policy 2.1: Reduce transportation related noise impacts to sensitive land uses through the use of noise control measures.

Policy 2.3: Incorporate sound-reduction design in development projects impacted by transportation related noise.

- **Noise Goal 3**: Minimize non-transportation related noise impacts to preserve the City's overall environment.

Policy 3.1: Reduce the impact of noise producing land uses and activities on noise sensitive land uses.

Policy 3.2: Incorporate sound-reduction design in new construction or rehabilitation projects impacted by non-transportation related noise.

Policy 3.3: Require mitigation measures to ensure that noise resulting from public and private construction projects is reduced to an acceptable level.

4.3.2 City of El Centro Code of Ordinances

The City's regulations with respect to noise are included in Chapter 17.1, *Noise Abatement and Control*, of the City's Code of Ordinances. This section provides exterior noise limits for the various land uses within the City. There standards are presented in Table 4-2.

Table 4-2. Exterior Noise Level Limits

Zone*	Time of Day	One-Hour Average
Single-Family Residential Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	55 45
Multi-Family Residential Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	55 50

Table 4-2. Exterior Noise Level Limits

Zone*	Time of Day	One-Hour Average
Commercial, Civic and Limited Use Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	60 55
Manufacturing Zones	7:00 a.m. – 10:00 p.m. 10:00 p.m. – 7:00 a.m.	75 70

Source: City of El Centro 2020

*Notes: *Zones which exists on the abutting or nearby property at whose boundary the measurement is taken. The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. If the measured ambient sound level exceeds the applicable limit shown in the Table, the allowable sound level shall be the ambient noise level minus 5 dB but not less than the sound level limit specified in the Table.*

Section 17.1-8, *Construction Equipment*, states that it shall be unlawful for any person to operate construction equipment at any construction site on Sundays, and days appointed by the president, governor, or the City council for a public holiday. In addition, it shall be unlawful for any person to operate construction equipment at any construction site on Mondays through Saturdays except between the hours of 6:00 a.m. and 7:00 p.m. Additionally, no such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any twenty-four hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

4.3.3 Federal Interagency Committee on Noise (FICON)

The FICON thresholds of significance assist in the evaluation of increased traffic noise. The 2000 FICON findings provide guidance as to the significance of changes in ambient noise levels due to transportation noise sources. FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the project creates a readily perceptible 5 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the project creates a barely perceptible 3 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the project creates a community noise level increase of greater than 1.5 dBA CNEL.

5.0 IMPACT ASSESSMENT

5.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act Guidelines Appendix G thresholds of significance. The project would result in a significant noise-related impact if it would produce:

1) 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.

2) Generation of excessive groundborne vibration or groundborne noise levels.

3) 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 two 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.

For purposes of this analysis, project construction noise is compared to the City's construction noise standard of 75 dBA at a residential property line. The increase in transportation-related noise is compared to the FICON recommendation for evaluating the impact of increased traffic noise. Noise generated onsite is compared against the City's exterior noise standards presented in Table 4-2.

5.2 Methodology

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. Predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Model (2006). Transportation-source noise levels in the project vicinity have been calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108). Groundborne vibration levels associated with construction-related activities for the project have been evaluated utilizing typical groundborne vibration levels associated with construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures and typically applied criteria for structural damage and human annoyance.

Baseline noise measurements were taken by ECORP with an Ex Tech SDL 600 precision sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. See Attachment A for noise measurement outputs.

An assessment of the land use compatibility considering the proposed location of sensitive noise receptors within the existing noise environment affecting the project site was completed by conducting existing ambient baseline noise measurements, on the afternoon of October 1, 2020, on and around the project site using an Ex Tech SDL 600 precision sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. Additionally, transportation- source noise levels for roadway segments that traverse the project site were calculated using the FHWA Highway Noise Prediction Model.

5.3 Impact Analysis

5.3.1 Project Construction Noise

Would the Project Result in Short-Term Construction-Generated Noise in Excess of Standards?

Construction noise associated with both the proposed project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site

Nearby noise-sensitive land uses consist of multi-family residential units located across 10th Street adjacent to the western project site boundary. There are also multi-family residences located directly across 8th Street to the east of the project site. As previously described, Section 17.1-8 of the City's Code of Ordinances states that it shall be unlawful for any person to operate construction equipment at any construction site on Sundays, and days appointed by the president, governor, or the City council for a public holiday. In addition, it shall be unlawful for any person to operate construction equipment at any construction site on Mondays through Saturdays except between the hours of 6:00 a.m. and 7:00 p.m. Additionally, no such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any twenty-four hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes

The anticipated short-term construction noise levels generated for the necessary construction equipment are presented in Table 5-1. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the project site (FTA 2018).

Table 5-1. Unmitigated Construction Average (dBA) Noise Levels at Nearest Receptor			
Equipment	**Estimated Exterior Construction Noise Level at Existing Residences**	**Construction Noise Standards (dBA L_{eq})**	**Exceeds Standards?**
Site Preparation			
Tractors/Loaders/Backhoes (1)	62.0	*75*	**No**
Combined Site Preparation Equipment	**62.0**	*75*	**No**
Grading			
Graders (2)	63.0 (each)	*75*	**No**
Scraper (1)	61.5	*75*	**No**
Combined Grading Equipment	**67.3**	*75*	**No**
Construction, Trenching, Paving & Painting			
Forklift (1)	61.4	*75*	**No**
Tractors/Loaders/Backhoes (2)	62.0(each)	*75*	**No**
Trencher (1)	54.1	*75*	**No**
Pavers (1)	56.1	*75*	**No**
Rollers (2)	54.9 (each)	*75*	**No**
Air Compressor (1)	55.6	*75*	**No**
Combined Construction, Trenching, Paving & Painting Equipment	**67.9**	*75*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment C for Model Data Outputs.

Notes: Construction equipment used during construction derived from CalEEMod 2016.3.2. *CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters.* The nearest residence is located approximately 400 feet from the center of the construction site.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 5-1, no individual or cumulative pieces of construction equipment would exceed the 75 dBA City construction noise standard during any phase of construction at the nearby noise-sensitive receptors.

5.3.2 Project Operational Noise

Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in Excess of County or City Standards During Operations?

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. The nearest existing noise-sensitive land use to the project site are multi-family residences located to the west across 10th Street. There are also multi-family residences located directly across 8th Street to the east of the project site.

Operational Offsite Traffic Noise

Future traffic noise levels throughout the project vicinity (i.e., vicinity roadway segments that traverse noise-sensitive land uses) for the proposed project were modeled based on the traffic volumes identified by Michael Baker International (2020) to determine the noise levels along project vicinity roadways. Table 5-2 shows the calculated offsite roadway noise levels under existing traffic levels compared to future buildout of the project. The calculated noise levels as a result of the project at affected sensitive land uses are compared to the FICON recommendation for evaluating the impact of increased traffic noise.

FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the project creates a readily perceptible 5 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the project creates a barely perceptible 3 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the project creates a community noise level increase of greater than 1.5 dBA CNEL

Table 5-2. Proposed Project Predicted Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway		Noise Standard (dBA CNEL)	Exceed Standard AND result in Noise Levels Exceeding Acceptable Exterior Noise Standards
		Existing Conditions	Existing + Project Conditions		
Cruickshank Drive					
Between Imperial Avenue and 12th Street	Residential and Commercial	55.7	55.9	>5	**No**
Between 12th Street and 10th Street	Residential and Commercial	54.7	55.0	>5	**No**
Bradshaw Road					
West of Imperial Avenue	Residential and Commercial	55.1	55.1	>5	**No**
Between Imperial Avenue and 12th Street	Residential and Commercial	51.8	52.1	>5	**No**
Between 12th Street and 10th Street	Residential	50.0	50.4	>5	**No**
Between 10th Street and 8th Street	Residential	48.2	49.8	>5	**No**
8th Street					
Between the project site driveway and Bradshaw Road	Residential	56.1	56.3	>5	**No**
Between Bradshaw Road and El Dorado Avenue	Residential	56.7	56.9	>5	**No**
South of El Dorado Avenue	Residential	56.4	56.5	>5	**No**
10th Street					
Between Cruickshank Drive and the project site Driveway	Residential	43.5	44.6	>5	**No**
Imperial Avenue					
South of Bradshaw Road	Commercial and Religious	61.7	61.7	>3	**No**

Source: Traffic noise levels were calculated by ECORP Consulting using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Michael Baker International 2020. Refer to Attachment B for traffic noise modeling assumptions and results.

Notes: A total of 11 intersections were analyzed in the Traffic Impact Analysis; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown in Table 5-2, no roadway segment would generate an increase of noise beyond the FICON significance standards.

Project Land Use Compatibility

The City uses the land use compatibility standards presented in the General Plan that provides the City with a tool to gauge the compatibility of new land users relative to existing noise levels. This table, presented as Table 4-1, identifies acceptable noise levels for various land uses, including residential land uses such as those proposed by the project. In the case that the noise levels identified at the Proposed project site fall within levels presented in the General Plan, the project is considered compatible with the existing noise environment. As previously stated, the project site is proposing 180 multi-family residential units. As shown in Table 4-1, a normally acceptable noise standard for residential land uses is 59 dBA CNEL or under. In order to quantify existing ambient noise levels in the project area, ECORP conducted three short-term noise measurements on October 1, 2020. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site and are considered representative of the noise levels throughout the day. As shown in Table 3-1, the ambient noise level recorded closest to the project site range from 52.0 dBA to 55.7 dBA.

Additionally, the roadway segment on 10th Street between Cruickshank Drive and the future location of the project site driveway, which is adjacent to the northwestern boundary of the project site, has a calculated existing roadway noise level of 43.5 dBA CNEL at 100 feet from the centerline of the road, which extends onto the site. Further, the roadway segment on Bradshaw Avenue between 10th Street and 8th Street, which traverses the southern boundary of the project site, has a calculated existing roadway noise level of 43.2 dBA CNEL at 100 feet from the centerline of the road, which extends onto the site. These modeled noise levels are reported in the noise metric, CNEL, which is the same noise metric promulgated by City noise compatibility guidelines contained in Table 4-1. As these noise levels fall below the noise standard, the project site is considered an appropriate noise environment to locate the proposed land use.

Project Operations-Onsite Noise Sources

As previously stated, noise sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. The nearest noise-sensitive land uses are multi-family residential units located directly across 10th Street and directly across 8th Street.

The primary operational noise source associated with the proposed project would be that of operational stationary sources. Potential stationary noise sources related to long-term operation of residences on the project site would include mechanical equipment and other typical sources specific to residential land uses such as barking dogs, internal traffic circulation, radios, and people talking. According to reference-field noise measurements conducted by ECORP, mechanical heating, ventilation, and air conditioning equipment generates noise levels less than 45 dBA at 20 feet, which is less than City's noise threshold for protecting residential uses. Urban residential noise, consisting of barking dogs, internal traffic circulation, radios, and people talking, generally registers at 55 to 60 dBA. Per field measurements conducted by ECORP on October 1, 2020, existing noise levels currently range from 52.0 dBA to 55.7 dBA directly adjacent to the project site and thus onsite project noise would be expected to generate noise at levels similar to those currently experienced. The proposed project places residential uses adjacent to other residential uses. The most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations within the community that would negatively affect noise sensitive land uses. The project is consistent with the types, intensity, and patterns of land use envisioned for the project area, and as previously described, the project is considered compatible with the existing noise environment. Operation of the project would not result in a significant noise-related impact associated with onsite sources.

5.3.3 Project Construction Groundborne Vibration

Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the project would be primarily associated with short-term construction-related activities. Construction on the project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is noted that pile drivers would not be necessary during project construction. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the project site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 5-3.

Table 5-3. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source: FTA 2018; Caltrans 2020

The City of El Centro does not regulate vibrations associated with construction. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the Caltrans (2020) recommended standard of 0.2 inch per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings. Consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of the project site (FTA 2018). The nearest structures of concern to the construction site is located across 10th Street and across 8th Street.

Based on the representative vibration levels presented for various construction equipment types in Table 5-3 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential project construction vibration levels. The FTA provides the following equation:

$$[PPVequip = PPVref \times (25/D)^{1.5}]$$

Table 5-4 presents the expected project related vibration levels at a distance of 400 feet.

Table 5-4. Construction Vibration Levels at 400 Feet

Receiver PPV Levels (in/sec)[1]					Peak Vibration	Threshold	Exceed Threshold
Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Vibratory Roller			
0.00004	0.005	0.001	0.001	0.003	**0.005**	*0.2*	**No**

Notes: [1]Based on the Vibration Source Levels of Construction Equipment included on Table 5-3 (FTA 2018). Distance to the nearest residence is approximately 400 feet measured from the center of the project site.

As shown in Table 5-4, vibration as a result of construction activities would not exceed 0.2 PPV at the nearest structure. Thus, project construction would not exceed the recommended threshold.

5.3.4 Project Operational Groundborne Vibration

Would the Project Expose Structures to Substantial Groundborne Vibration During Operations?

Project operations would not include the use of any large-scale stationary equipment that would result in excessive vibration levels. Therefore, the project would not result groundborne vibration impacts during operations.

5.3.5 Excess Airport Noise

Would the Project Expose People Residing or Working in the Project area to Excessive Airport Noise?

The project site is located approximately one-mile northwest from the Imperial County Airport. The Imperial County Airport Land Use Commission has established a set of land use compatibility criteria for lands surrounding the airports in Imperial County. The Imperial County Airport Land Use Compatibility Plan (County 1996) identifies the project site as being located within Zone B2, Extended Approach Departure Zone of the Imperial County Airport. However, as shown in Figure N-2 of the El Centro General Plan Noise Element the project site lays outside of the noise contours of the Imperial County Airport. Thus, the project would not exposure residents to excessive airport noise.

5.3.6 Cumulative Noise

Would the Project Contribute to Cumulatively Considerable Noise During Construction?

Construction activities associated with the proposed project and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the proposed project was determined to be less than significant following compliance with City noise standards. Cumulative development in the vicinity of the project site could result in elevated construction noise levels at sensitive receptors in the project area. However, each project would be required to comply with the applicable noise limitations on construction. Therefore, the project would not contribute to cumulative impacts during construction.

Would the Project Contribute to Cumulatively Considerable Noise from Traffic?

Cumulative traffic noise levels throughout the project vicinity (i.e., vicinity roadway segments that traverse noise-sensitive land uses) were modeled based on the traffic volumes identified by Michael Baker International (2020) to determine the noise levels along project vicinity roadways. Table 5-5 shows the calculated offsite roadway noise levels under cumulative conditions without the project (Cumulative No Project) compared to cumulative conditions plus future buildout of the project (Cumulative Plus Project). The calculated noise levels as a result of Cumulative Plus Project conditions at affected sensitive land uses are compared to the FICON significance standards.

FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the project creates a readily perceptible 5 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or

- If the existing noise levels range from 60 to 65 dBA CNEL and the project creates a barely perceptible 3 dBA CNEL or greater noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or

- If the existing noise levels already exceed 65 dBA CNEL, and the project creates a community noise level increase of greater than 1.5 dBA CNEL

Table 5-5. Cumulative Traffic Noise Scenario

Roadway Segment	Cumulative No Project	Cumulative Plus Project	Noise Standard (dBA CNEL)	Exceed Standard AND result in Noise Levels Exceeding Acceptable Exterior Noise Standards?
	CNEL @ 100 Feet from Roadway Centerline	CNEL @ 100 Feet from Roadway Centerline		
Cruickshank Drive				
Between Imperial Avenue and 12th Street	57.1	58.2	*>5*	**No**

Table 5-5. Cumulative Traffic Noise Scenario				
Between 12th Street and 10th Street	56.4	58.6	>5	**No**
Bradshaw Road				
West of Imperial Avenue	56.2	57.0	>5	**No**
Between Imperial Avenue and 12th Street	52.3	52.6	>5	**No**
Between 12th Street and 10th Street	51.0	51.1	>5	**No**
Between 10th Street and 8th Street	50.1	53.1	>5	**No**
8th Street				
Between the project site driveway and Bradshaw Road	57.3	57.3	>5	**No**
Between Bradshaw Road and El Dorado Avenue	57.8	59.0	>5	**No**
South of El Dorado Avenue	57.5	57.6	>5	**No**
10th Street				
Between Cruickshank Drive and the project site Driveway	46.3	46.9	>5	**No**
Imperial Avenue				
South of Bradshaw Road	63.0	63.0	>3	**No**

Source: Traffic noise levels were calculated by ECORP Consulting using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Michael Baker International 2020. Refer to Attachment B for traffic noise modeling assumptions and results.

Notes: A total of 11 intersections were analyzed in the Traffic Impact Analysis; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown in Table 5-5, no roadway segment would generate an increase of noise beyond the FICON significance standards in any scenario. Therefore, no mobile-source cumulative impacts would occur.

Cumulative Stationary Source Noise Impacts

Long-term stationary noise sources associated with the development at the project, combined with other cumulative projects, could cause local noise level increases. Noise levels associated with the proposed project and related cumulative projects together could result in higher noise levels than considered separately. As previously described, onsite noise sources associated with the proposed project was found to be acceptable as they do not exceed the City noise standards. Additionally, the project is locating residential land uses adjacent to other residential land uses. Therefore, the project would not contribute to cumulative impacts during operations.

6.0 REFERENCES

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LIST OF ATTACHMENTS

Attachment A - Baseline (Existing) Noise Measurements – Project Site and Vicinity

Attachment B - Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108) Outputs – Project Traffic Noise

Attachment C - Federal Highway Administration Highway Roadway Construction Noise Outputs – Project Construction Noise

ATTACHMENT A

Baseline (Existing) Noise Measurements – Project Site and Vicinity

Map Date: *11/5/2020*
Photo (or Base) Source: *Google Earth Pro 2020*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Baseline Noise Measurement Locations

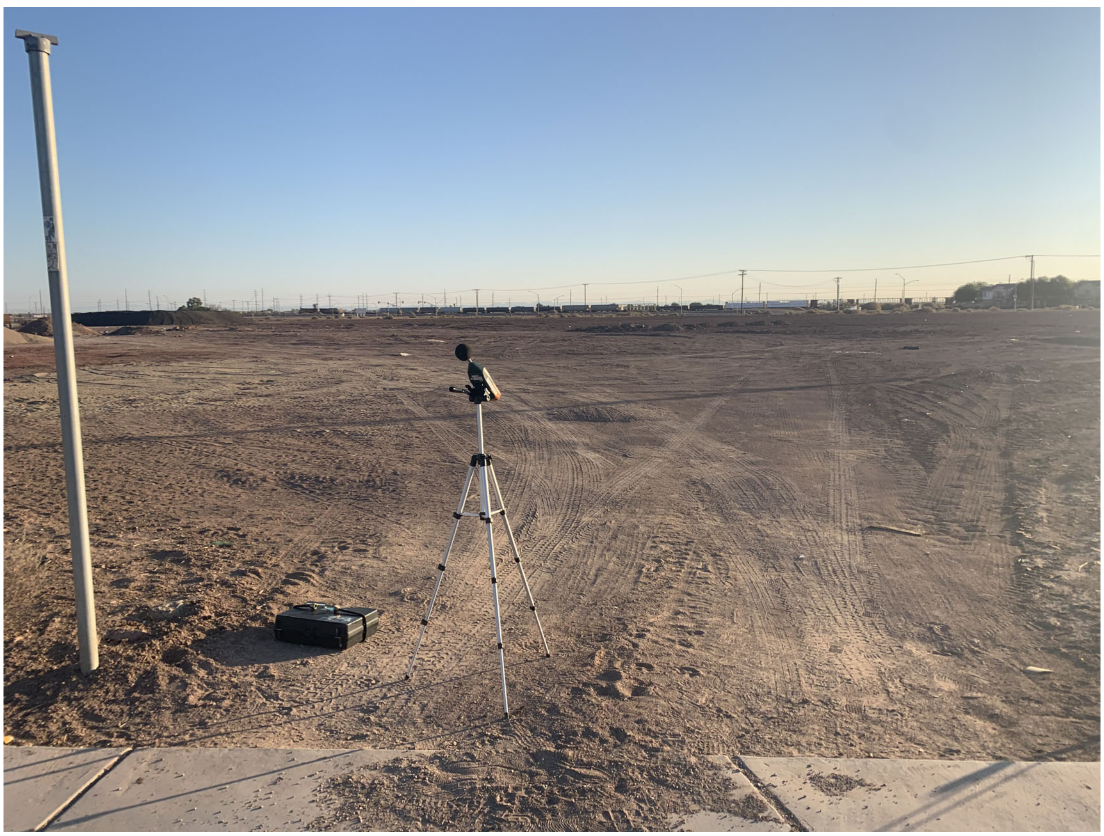
2020-159 Town Center Village

Site Number: 1
Recorded By: Jessie Beckman
Job Number: 2020-159
Date: 10/1/2020
Time: 7:27 a.m.- 7:57 a.m.
Location: Corner of Bradshaw Avenue and N. 10th Street
Source of Peak Noise: Vehicles on adjacent roadways

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
55.7	45.7	75.6	

Weather Data			
Est.	**Duration:** 30 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	77	29.97

Photo of Measurement Location



Site Number: 2			
Recorded By: Jessie Beckman			
Job Number: 2020-159			
Date: 10/1/2020			
Time: 8:04 a.m. – 8:34 a.m.			
Location: Residential complex on N. 8th Street across from Project site			
Source of Peak Noise: Vehicles on adjacent roadways			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
61.3	46.6	75.6	

Weather Data			
Est.	**Duration:** 30 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	77	29.97

Photo of Measurement Location

Site Number: 3
Recorded By: Jessie Beckman
Job Number: 2020-159
Date: 10/1/2020
Time: 8:45 a.m. – 9:15 a.m.
Location: Intersection of N. 10th Street and Cruickshank Drive
Source of Peak Noise: Vehicles on adjacent roadways

Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
52.0	36.6	79.2	

Weather Data			
Est.	**Duration:** 30 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	77	29.97

Photo of Measurement Location

ATTACHMENT B

Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108) Outputs – Project Traffic Noise

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2020-159
Project Name: El Centro Town Center

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes:	Michael Baker International 2020
Community Noise Descriptor:	L_{dn}: ____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Distance from Centerline of Roadway: CNEL at 100 Feet	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Traffic Volumes: Day	Eve	Night
Existing																
Cruickshank Drive																
Between Imperial Avenue and 12th Street	4	0	2,727	45	0.5	1.8%	0.7%	**55.7**	-	-	52	111	100	2,119	346	262
Between 12th Street and 10th Street	4	0	2,196	45	0.5	1.8%	0.7%	**54.7**	-	-	45	96	100	1,706	279	211
Bradshaw Road																
West of Imperial Avenue	2	0	4,428	35	0.5	1.8%	0.7%	**55.1**	-	-	47	102	100	3,441	562	425
Between Imperial Avenue and 12th Street	2	0	2,074	35	0.5	1.8%	0.7%	**51.8**	-	-	-	61	100	1,611	263	199
Between 12th Street and 10th Street	2	0	1,350	35	0.5	1.8%	0.7%	**50.0**	-	-	-	46	100	1,049	171	130
Between 10th Street and 8th Street	2	0	895	35	0.5	1.8%	0.7%	**48.2**	-	-	-	35	100	695	114	86
8th Street																
Between the Project site driveway and Bradshaw Road	4	0	3,996	40	0.5	1.8%	0.7%	**56.1**	-	-	55	119	100	3,105	507	384
Between Bradshaw Road and El Dorado Avenue	4	0	4,617	40	0.5	1.8%	0.7%	**56.7**	-	-	61	131	100	3,587	586	443
South of El Dorado Avenue	4	0	4,293	40	0.5	1.8%	0.7%	**56.4**	-	-	58	125	100	3,336	545	412
10th Street																
Between Cruickshank Drive and the Project site Driveway	2	0	225	40	0.5	1.8%	0.7%	**43.5**	-	-	-	-	100	175	29	22
Imperial Avenue																
South of Bradshaw Road	4	0	10,809	45	0.5	1.8%	0.7%	**61.7**	-	60	129	278	100	8,399	1,373	1,038

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2020-159
Project Name: El Centro Town Center

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Michael Baker International 2020
Community Noise Descriptor: L_{dn}: ______ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway – Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Traffic Volumes Day	Eve	Night
Existing + Project																
Cruickshank Drive																
Between Imperial Avenue and 12th Street	4	0	2,839	45	0.5	1.8%	0.7%	**55.9**	-	-	53	114	100	2,206	361	273
Between 12th Street and 10th Street	4	0	2,317	45	0.5	1.8%	0.7%	**55.0**	-	-	46	100	100	1,800	294	222
Bradshaw Road																
West of Imperial Avenue	2	0	4,446	35	0.5	1.8%	0.7%	**55.1**	-	-	47	102	100	3,455	565	427
Between Imperial Avenue and 12th Street	2	0	2,218	35	0.5	1.8%	0.7%	**52.1**	-	-	-	64	100	1,723	282	213
Between 12th Street and 10th Street	2	0	1,507	35	0.5	1.8%	0.7%	**50.4**	-	-	-	50	100	1,171	191	145
Between 10th Street and 8th Street	2	0	1,296	35	0.5	1.8%	0.7%	**49.8**	-	-	-	45	100	1,007	165	124
8th Street																
Between the Project site driveway and Bradshaw Road	4	0	4,153	40	0.5	1.8%	0.7%	**56.3**	-	-	57	122	100	3,227	527	399
Between Bradshaw Road and El Dorado Avenue	4	0	4,747	40	0.5	1.8%	0.7%	**56.9**	-	-	62	133	100	3,688	603	456
South of El Dorado Avenue	4	0	4,383	40	0.5	1.8%	0.7%	**56.5**	-	-	59	126	100	3,406	557	421
10th Street																
Between Cruickshank Drive and the Project site Driveway	2	0	288	40	0.5	1.8%	0.7%	**44.6**	-	-	-	-	100	224	37	28
Imperial Avenue																
South of Bradshaw Road	4	0	10,926	45	0.5	1.8%	0.7%	**61.7**	-	60	130	280	100	8,490	1,388	1,049

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2020-159
Project Name: El Centro Town Center

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Michael Baker International 2020
Community Noise Descriptor: L_{dn}: ______ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	CNEL at 100 Feet	Distance from Centerline of Roadway – Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Traffic Volumes Day	Eve	Night
Future No Project																
Cruickshank Drive																
Between Imperial Avenue and 12th Street	4	0	3,765	45	0.5	1.8%	0.7%	**57.1**	-	-	64	138	100	2,925	478	361
Between 12th Street and 10th Street	4	0	3,238	45	0.5	1.8%	0.7%	**56.4**	-	-	58	125	100	2,516	411	311
Bradshaw Road																
West of Imperial Avenue	2	0	5,670	35	0.5	1.8%	0.7%	**56.2**	-	-	56	120	100	4,406	720	544
Between Imperial Avenue and 12th Street	2	0	2,326	35	0.5	1.8%	0.7%	**52.3**	-	-	-	66	100	1,807	295	223
Between 12th Street and 10th Street	2	0	1,699	35	0.5	1.8%	0.7%	**51.0**	-	-	-	54	100	1,320	216	163
Between 10th Street and 8th Street	2	0	1,377	35	0.5	1.8%	0.7%	**50.1**	-	-	-	47	100	1,070	175	132
8th Street																
Between the Project site driveway and Bradshaw Road	4	0	5,211	40	0.5	1.8%	0.7%	**57.3**	-	-	66	142	100	4,049	662	500
Between Bradshaw Road and El Dorado Avenue	4	0	5,917	40	0.5	1.8%	0.7%	**57.8**	-	-	72	154	100	4,598	751	568
South of El Dorado Avenue	4	0	5,526	40	0.5	1.8%	0.7%	**57.5**	-	-	68	147	100	4,294	702	530
10th Street																
Between Cruickshank Drive and the Project site Driveway	2	0	427	40	0.5	1.8%	0.7%	**46.3**	-	-	-	-	100	332	54	41
Imperial Avenue																
South of Bradshaw Road	4	0	14,643	45	0.5	1.8%	0.7%	**63.0**	-	73	158	341	100	11,378	1,860	1,406

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2020-159
Project Name: El Centro Town Center

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes:	Michael Baker International 2020
Community Noise Descriptor:	L_{dn}: ____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Distance from Centerline of Roadway: CNEL at 100 Feet	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Traffic Volumes: Day	Eve	Night
Future With Project																
Cruickshank Drive																
Between Imperial Avenue and 12th Street	4	0	4,878	45	0.5	1.8%	0.7%	**58.2**	-	-	76	164	100	3,790	620	468
Between 12th Street and 10th Street	4	0	5,359	45	0.5	1.8%	0.7%	**58.6**	-	-	81	174	100	4,164	681	514
Bradshaw Road																
West of Imperial Avenue	2	0	6,744	35	0.5	1.8%	0.7%	**57.0**	-	-	63	135	100	5,240	856	647
Between Imperial Avenue and 12th Street	2	0	2,466	35	0.5	1.8%	0.7%	**52.6**	-	-	32	69	100	1,916	313	237
Between 12th Street and 10th Street	2	0	1,756	35	0.5	1.8%	0.7%	**51.1**	-	-	-	55	100	1,364	223	169
Between 10th Street and 8th Street	2	0	2,754	35	0.5	1.8%	0.7%	**53.1**	-	-	34	74	100	2,140	350	264
8th Street																
Between the Project site driveway and Bradshaw Road	4	0	5,224	40	0.5	1.8%	0.7%	**57.3**	-	-	66	142	100	4,059	663	502
Between Bradshaw Road and El Dorado Avenue	4	0	7,821	40	0.5	1.8%	0.7%	**59.0**	-	-	86	186	100	6,077	993	751
South of El Dorado Avenue	4	0	5,616	40	0.5	1.8%	0.7%	**57.6**	-	-	69	149	100	4,364	713	539
10th Street																
Between Cruickshank Drive and the Project site Driveway	2	0	490	40	0.5	1.8%	0.7%	**46.9**	-	-	-	-	100	381	62	47
Imperial Avenue																
South of Bradshaw Road	4	0	14,760	45	0.5	1.8%	0.7%	**63.0**	-	74	159	342	100	11,469	1,875	1,417

ATTACHMENT C

Federal Highway Administration Highway Roadway Construction Noise Outputs – Project Construction Noise

Roadway Construction Noise Model (RCNM),Version 1.1

Report date:	11/2/2020
Case Description:	Site Preparation

Description	**Affected Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Tractor	No	40	84		400

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Tractor		65.9	62
	Total	**65.9**	**62**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/2/2020
Case Description: Grading

Description	**Affected Land Use**
Grading	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Grader	No	40	85		400
Grader	No	40	85		400
Scraper	No	40		83.6	400

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		66.9	63
Grader		66.9	63
Scraper		65.5	61.5
	Total	**66.9**	**67.3**

*Calculated Lmax is the Loudest value.

Report date: 11/2/2020
Case Description: Construction, Trenching, Paving & Painting

Description	Affected Land Use
Construction, Trenching, Paving & Painting	Residential

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)
Gradall	No	40		83.4	400
Tractor	No	40	84		400
Tractor	No	40	84		400
Trencher	No	20		79.1	400
Paver	No	50		77.2	400
Roller	No	20		80	400
Roller	No	20		80	400
Compressor (air)	No	40		77.7	400

Calculated (dBA)

Equipment		*Lmax	Leq
Gradall		65.3	61.4
Tractor		65.9	62
Tractor		65.9	62
Trencher		61.1	54.1
Paver		59.2	56.1
Roller		61.9	54.9
Roller		61.9	54.9
Compressor (air)		59.6	55.6
	Total	**65.9**	**67.9**

*Calculated Lmax is the Loudest value.

Appendix E
Transportation Impact Study

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TRANSPORTATION IMPACT STUDY

Town Center Village Phase IV

Prepared for:
City of El Centro
Planning Development
1275 W. Main Street
El Centro, CA 92243

March 18, 2021

5050 Avenida Encinas, Suite 260, Carlsbad, CA 92008
Office: 760.603-6266 | Fax: 760.476.9198
Contact: dwilson@mbakerintl.com
JN 180263

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1 EXECUTIVE SUMMARY

This transportation impact study analyzes the forecast transportation conditions associated with the proposed Town Center Village Phase IV project (project). The project site is located at the northeast corner of Bradshaw Avenue and N. 10th Street in the City of El Centro. The project proposes a rezone of the property from CG-General Commercial to R3-Multiple Family Residential to allow for development of a 180-unit apartment complex. A General Plan Amendment is also required to change the existing General Plan land use designation from General Commercial to High Density Residential.

1.1 CEQA ANALYSIS SUMMARY

In December 2018, new California Environmental Quality Act (CEQA) guidelines were approved that shift transportation analysis from delay and operations to vehicle miles traveled (VMT) when evaluating transportation Impacts under CEQA. This change in methodology is a result of Senate Bill 743 (SB743), which was signed into law in September 2013. The Governor's Office of Planning and Research (OPR) released *Technical Advisory on Evaluating Transportation Impacts in CEQA* in December 2018 (Technical Advisory) that contains recommendations regarding assessment of VMT, screening criteria, thresholds of significance, and approach to mitigating impacts. Statewide implementation VMT as the metric for evaluating transportation impacts under CEQA occurred on July 1, 2020. The City is currently developing new traffic study guidelines to comply with SB743; however, the guidelines were not complete or accepted at the time this report was prepared. Therefore, OPR's Technical Advisory was used to evaluate the project's transportation impacts based on VMT. The proposed project is located within a VMT efficient area and is determined to have a less than significant impact and a detailed VMT analysis is not required.

1.2 LOCAL MOBILITY ASSESSMENT (LEVEL OF SERVICE) SUMMARY

While transportation impacts are based on VMT, the City also requires analysis of intersection and roadway segment operating conditions for their Local Mobility Assessment. The City has established LOS C as the standard for acceptable operating conditions. The results of the intersection analysis conducted in the Local Mobility Assessment show that nine of the eleven study intersections operate at LOS C or better under Existing and Existing Plus Project conditions except for Imperial Avenue (SR-86) / Cruickshank Drive and Imperial Avenue (SR-86) / Bradshaw Avenue which operate at LOS D with and without project traffic. For intersections operating at LOS D, the City considers 2 seconds of delay considerable and would require intersection improvements to offset the change in delay. The analysis shows that the project related traffic does not increase the change in delay by more than 2 seconds. Therefore, improvements at these locations are not warranted.

Under Opening Year 2022 conditions and Horizon Year 2040 conditions, Imperial Avenue (SR-86) / Cruickshank Drive and Imperial Avenue (SR-86) / Bradshaw Avenue continues to operate below the City's acceptable LOS C operating condition (LOS D and E). However, project related traffic does not increase the change in delay by more than 2 seconds. Therefore, improvements at these two intersections are not warranted.

At the unsignalized intersection of 8th Street/Project Driveway, a dedicated right-turn lane is assumed in the southbound approach under the Existing Plus Project, Opening Year 2022 Plus Project, and Horizon

Year 2040 Plus Project conditions. However, this right-turn lane is not required to achieve acceptable operating conditions (LOS C or better) at this project access. Therefore, the dedicated right-turn lane is not required for operations but could be provided by the applicant as a project feature to improve vehicular access to the project site.

The results of the roadway segment analysis show that all nine (9) segments currently operate better than the City's LOS C standard. Under Existing Plus Project conditions, Opening Year 2022 Without and With Project conditions, and Horizon Year 2040 Without and With Project conditions, all nine of the study roadway segments continue to operate at LOS C or better. Therefore, improvements are not warranted on any of the study roadway segments.

1.3 SIGNAL WARRANT SUMMARY

The 2014 *California Manual on Uniform Traffic Control Devices* (*CA MUTCD*) contains minimum guidelines regarding traffic volumes, collisions, speeds, visibility and other criteria in order to satisfy the requirements for the recommendation of a traffic signal.

Both of the project driveways are planned to be stop controlled. The analysis shows both project driveways along 8th Street and 10th Street operate at an acceptable LOS C or better during the "Plus Project" scenarios Therefore, a signal warrant was not evaluated at the project driveways. A Peak Hour Warrant (CA MUTCD Warrant #3) was evaluated at the intersection of 8th Street / El Dorado Family Apartment Driveway (Int. #11) since this location is currently unsignalized and operating deficiently (LOS D) in the PM peak hour under Horizon Year 2040 conditions. However, this intersection did not meet signal warrants.

1.4 RECOMMENDED IMPROVEMENTS

The results of the analysis show that the project is not responsible for constructing any off-site improvements since they are not warranted in accordance with the County of Imperial *Traffic Study and Report Policy (TSRP)* revised on June 29, 2007.

The recommended site access driveway improvements for the Project are described below.

8th Street/Project Driveway (Study Int. #10)

- This main driveway may be configured as a full access driveway with side-street stop control on the eastbound approach and free-flow along 8th Street for all "Plus Project" conditions.
- 8th Street is currently four-lane divided Arterial with a two-way left-turn lane in the center allowing project traffic to make left-turning movements into the project site from the northbound approach.

10th Street/Southern Project Driveway (Study Int. #9)

- The secondary or southern driveway may be configured as a full access (two-way) driveway with side-street stop control on the eastbound and westbound approaches and free-flow along 10th Street for all "Plus Project" conditions. This driveway would be positioned directly across from the existing driveway serving the multi-family residential properties (Town Center Villa) on the west side of 10th Street.

- 10^{th} Street is a low volume residential street providing two travel lanes (one in each direction) along the project frontage between Cruickshank Drive and Bradshaw Avenue. A dedicated left-turn lane in the southbound approach at this project access point is not necessary due to the low peak hour volumes on 10^{th} Street (25 AM and 94 PM peak hour trips in northbound approach) and the low left-turning volume into the project site (3 AM and 11 PM peak hour trips turning left).
- The proposed gate should be recessed into the property at a minimum of 25 feet from the edge of curb to provide stacking for at least one vehicle waiting to enter through the gate so that a vehicle is not blocking through traffic on 10^{th} Street or impede traffic entering Town Center Villa Apartments.

10^{th} Street / Northern Project Driveway

- The northern project driveway (a secondary driveway) is located approximately 100 feet north of the southern project driveway. This driveway will also be gated and configured as an exit only driveway.
- This traffic analysis assumes project traffic entering and exiting 10th Street will use the southern driveway to provide a conservative analysis.

The project driveways on 8^{th} Street and 10^{th} Street should be free and clear of any obstructions to provide adequate sight distance ensuing that exiting vehicles from the new driveways can adequately see not only other vehicles, but also pedestrians and bicyclists. Any landscaping and signage at the project driveways should not obstruct the drivers view from exiting the project site.

2 INTRODUCTION

This study analyzes the forecast transportation conditions associated with the Town Center Village Phase IV project (project) located at the northeast corner of Bradshaw Avenue and N. 10th Street in the City of El Centro.

2.1 PROJECT DESCRIPTION

The proposes a rezone of the property from CG-General Commercial to R3-Multiple Family Residential to allow for development of a 180-unit apartment complex in multiple buildings on a 19.3-acre site. A General Plan Amendment will also be required to change the existing General Plan land use designation from General Commercial to High Density Residential. The project site is currently vacant and undeveloped. Vehicular access to the project site will be provided via one full access driveway on 8th Street and a full access driveway at the southern driveway on 10th Street. The northern driveway on 10th Street will be configured as an exit only driveway. All three project access points will be gated with key card access to residents.

2.2 PROJECT LOCATION

The project site is bounded by Cruickshank Drive to the north, Bradshaw Avenue to the south, 10th Street to the west and 8th Street to the east. The northern portion of the project site consisting of approximately 7.8 acres will remain vacant. The southern portion of the project site will include 180 multi-family dwelling units on approximately 11.5 acres.

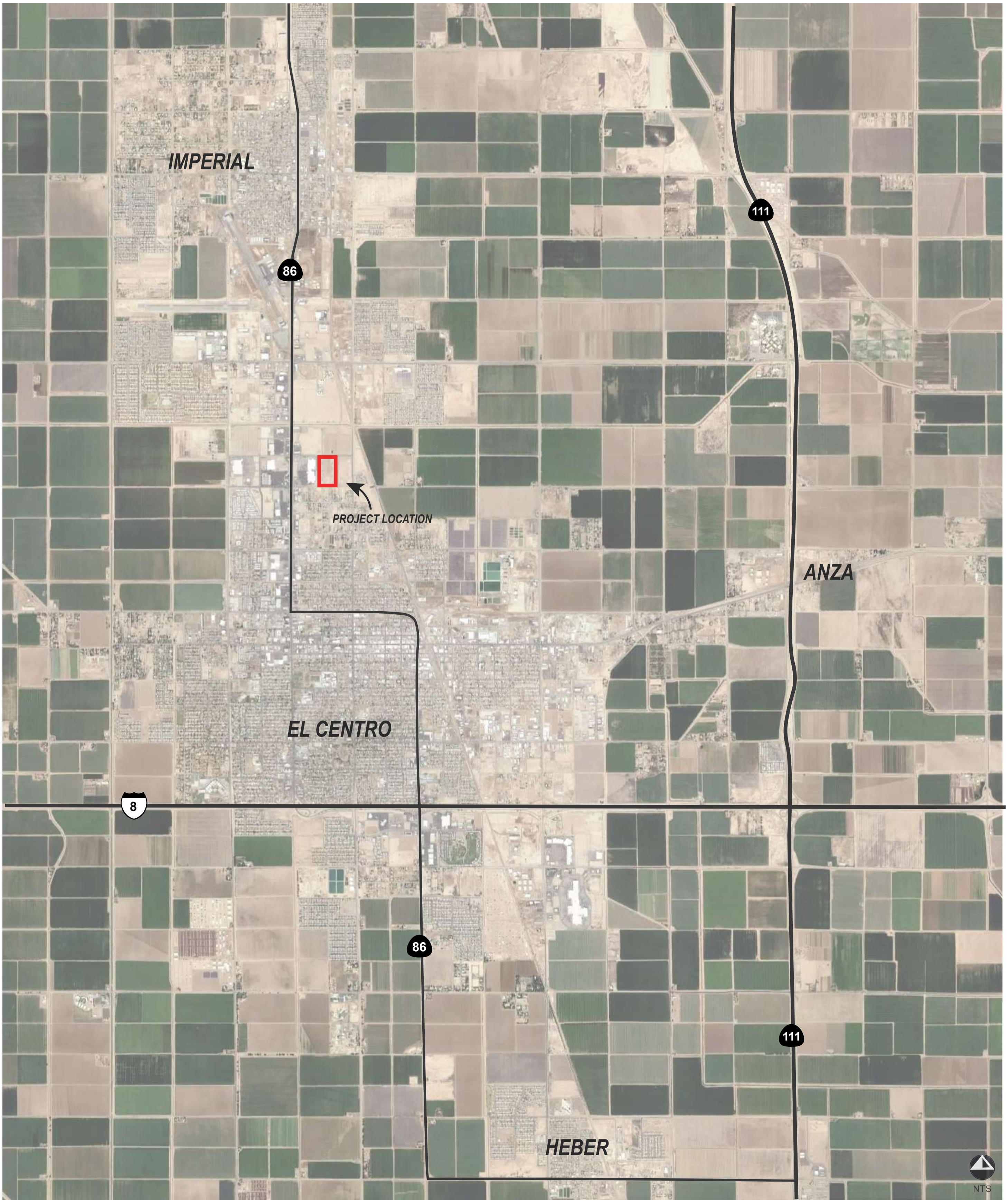
Exhibit 1 shows the location of the project site. **Exhibit 2** provides the project site plan.

2.3 CEQA VMT ANALYSIS SCOPE

The CEQA transportation analysis scope is based on OPR's Technical Advisory. According to the Technical Advisory, a project that meets at least one of the screening criteria would not be required to prepare a detailed VMT analysis and would be presumed to have a less-than-significant VMT impact. The proposed project is located within a VMT efficient area based on an evaluation of the project's traffic analysis zones (TAZ) and TAZ's surrounding the project site within a one-mile radius and thus meets the screening criteria for a CEQA VMT analysis. Therefore, the proposed project would not be required to prepare a detailed CEQA VMT analysis and would also have a less-than-significant VMT impact on the environment.

2.4 LOCAL MOBILITY ANALYSIS SCOPE

A Local Mobility Analysis (LMA) has been prepared in accordance with the County of Imperial *Traffic Study and Report Policy (TSRP)* revised on June 29, 2007. While not part of the CEQA review, the LMA is provided to address localized operational and safety concerns for all transportation modes. The proposed project is consistent with the General Plan and is expected to generate approximately 1,320 daily trips. According to the County's TSRP, projects that generate more than 400 daily residential trips are required to prepare a full LMA.



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Project Location Map

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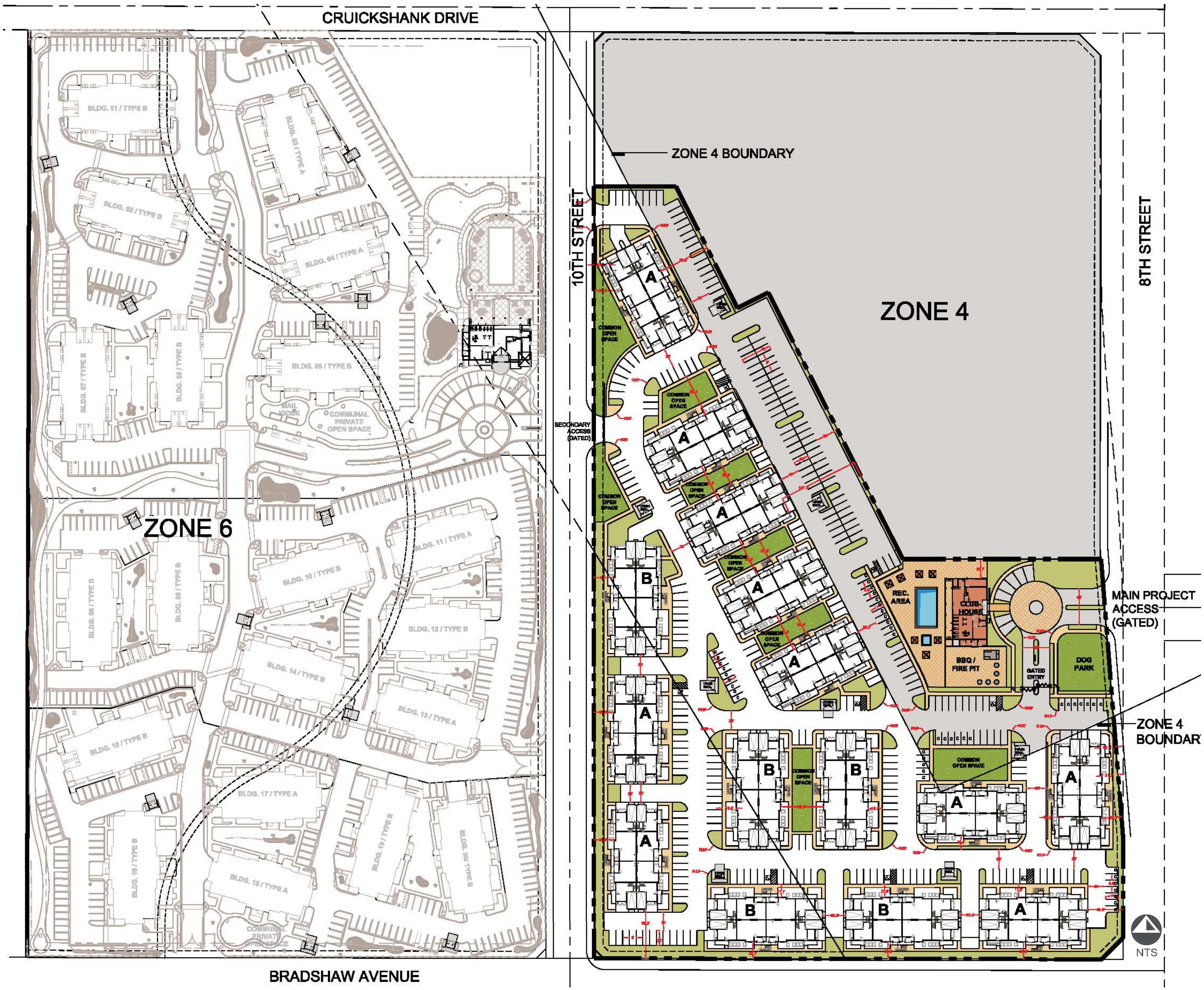
Exhibit 1



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SOURCE: Danielian Associates Architects-Planners

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Project Site Plan

Exhibit 2

3 CEQA VMT ANALYSIS

In December 2018 new CEQA guidelines were approved that shift traffic analysis from delay and operations to VMT when evaluating Transportation Impacts under CEQA. This change in methodology is a result of SB743, which was signed into law in September 2013. SB743 "creates a process to change the way that transportation impacts are analyzed under CEQA. Specifically, SB743 requires OPR to amend the CEQA Guidelines to provide an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must 'promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.'[1] "[2]

As part of the development of the new CEQA guidelines, OPR prepared a Technical Advisory**.** The final version of the Technical Advisory is dated December 2018 and provides guidance for local jurisdictions in developing methodologies and thresholds for evaluating VMT. The Technical Advisory recommends establishing the VMT threshold at 85% or less of an adopted VMT threshold including VMT/capita for residential projects. The City of El Centro is currently developing their own VMT thresholds and guidelines; however the guidelines were not final or adopted at the time this report was prepared. Therefore, the project's VMT analysis is based on OPR's Technical Advisory.

3.1 VMT SCREENING CRITERIA

The Technical Advisory includes screening criteria for all land development projects. A project that meets at least one of the screening criteria would have a less-than-significant VMT impact due to project characteristics and/or location. Each of the screening criteria have been reviewed to determine if the proposed project meets the screening criteria, see **Table 1**.

TABLE 1: VMT SCREENING CRITERIA EVALUATION

ID	VMT Screening Criteria	Description	Screening Evaluation	Criteria Met? (Yes / No)
1	Small Projects	Projects that generate less than 110 daily trips.	The proposed project generates 1,320 daily trips.	No
2	Projects Located in a VMT Efficient Area	Projects that are located within a VMT efficient area (more than 15% below the Regional Average VMT).	Refer to Section 3.2 below for more information regarding the project meeting this criterion.	**YES**
3	Projects Located in a Transit Accessible Area	Projects located within a half mile of an existing major transit stop or an existing stop along a high-quality transit corridor.	The project is not located within a half mile of an existing major transit stop or an existing stop along a high-quality transit corridor.	No
4	Affordable Housing	100% of residential units are affordable.	The project is not constructing any affordable units.	No

The project meets one of the four VMT screening criteria. Since at least one of the VMT screening criteria is satisfied, a detailed VMT analysis is not required, and the proposed project is presumed to have a less-than-significant transportation impact.

[1] Public Resources Code Section 21099(b)(1)
[2] Office of Planning and Research, http://www.opr.ca.gov/ceqa/updates/sb-743/

3.2 VMT EFFICIENT AREA EVALUATION

According to the Technical Advisory, the metric for evaluating VMT for residential projects is Home Based VMT per Capita. The City of El Centro is currently updating their 2040 General Plan. As part of this effort, the Imperial County Transportation Model (ICTM) Base Year 2014 was utilized to establish the baseline VMT within the City and Imperial County Region. Based on modeling efforts conducted for the General Plan, the Imperial County baseline (2014) Total Home Based VMT is 2,192,401 with a population of 183,309. Therefore, the regional Home Based VMT/capita is equal to 11.96 (2,192,401 / 183,309).

The Technical Advisory suggests a threshold of significance of 15% below the baseline condition. Therefore, the threshold of significance for Imperial County is 10.17 VMT/capita.

Using the baseline (2014) ICTM, the Home-Based VMT/capita was extracted for the traffic analysis zone (TAZ) where the project is located. Since the existing TAZ has a very low number of residential units (10 HH), the residential VMT/capita for TAZ's within a one-mile radius of the project site were also extracted to compare and validate the VMT for the project TAZ.

Exhibit 3 provides a map of the project TAZ's as well as those within one mile of the site. **Table 2** provides the VMT/capita for the TAZ's evaluated. **Appendix A** includes VMT information and land use information for TAZ's within the City of El Centro.

The Home Based VMT per capita for each TAZ was compared to the threshold of significance to determine if the project TAZ and the area surrounding the project TAZ is considered to be VMT efficient (85% of the regional average). Table 2 shows that all but one of the TAZ's near the project site below the threshold of significance. It is reasonable to assume the project is located within a VMT efficient area and as such satisfies the VMT Efficient Area screening criteria. Since the project is forecast to have a less than significant transportation impact, no additional analysis is required, and mitigation measures have not been identified.

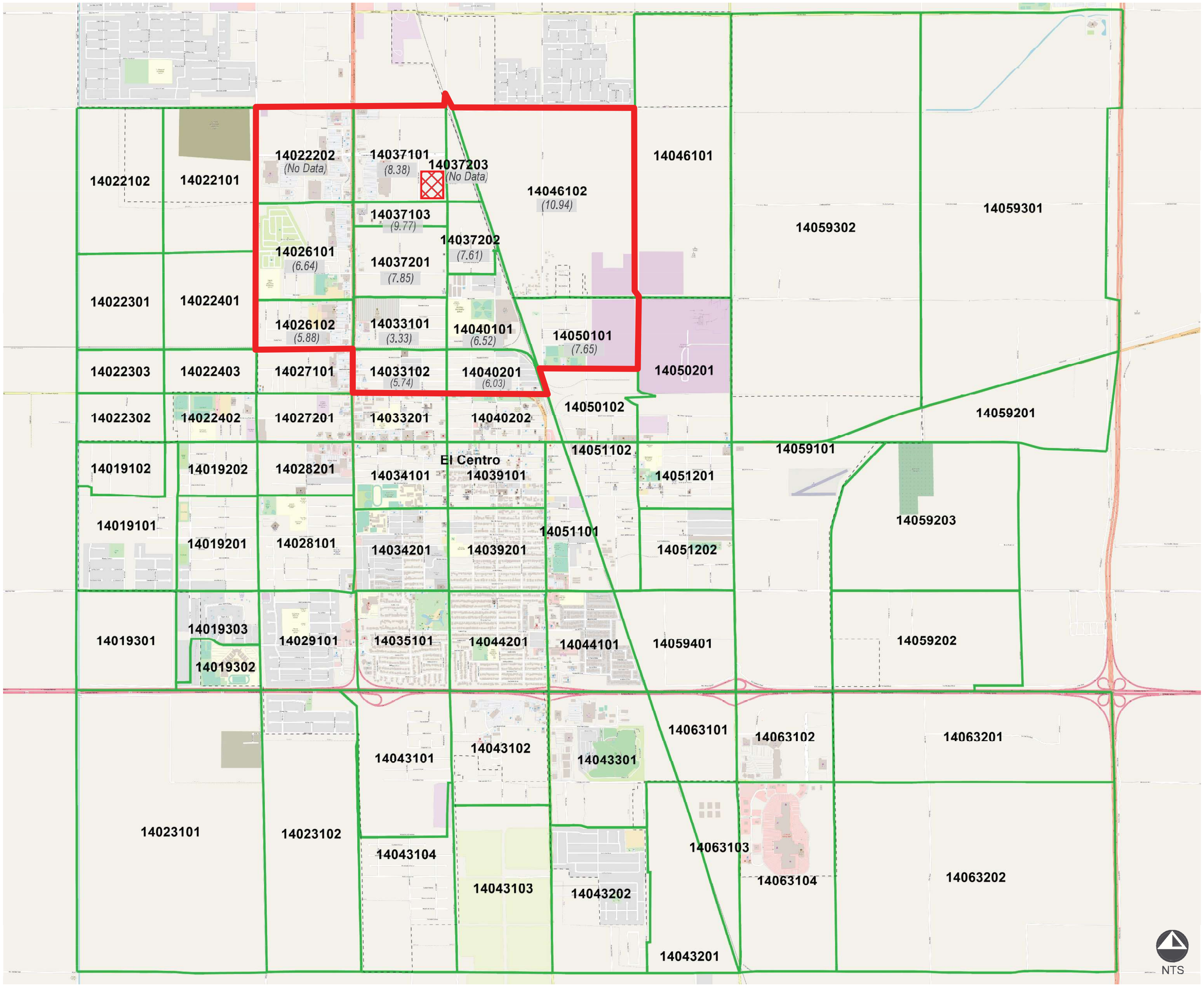
TABLE 2: VMT/CAPITA FOR TAZ'S WITHIN ONE MILE OF PROJECT SITE

TAZ	Total Home-Based VMT/Capita	Threshold (85% of Regional Average) (1)	Above or Below Threshold of Significance?	Considered VMT Efficient & Less-Than-Significant?
14037101	8.38	10.17	Below	Yes
14026102	5.88		Below	Yes
14046102	10.94		Above	No
14037103	9.77		Below	Yes
14026101	6.64		Below	Yes
14037201	7.85		Below	Yes
14037202	7.61		Below	Yes
14033101	3.33		Below	Yes
14040101	6.52		Below	Yes
14050101	7.65		Below	Yes
14033102	5.74		Below	Yes
14040201	6.03		Below	Yes
Average	**7.20**	**60%**	**Below**	**Yes**

Source: Baseline 2014 ICTM (Iteris, January 2021)

1 Regional Home Based VMT/Capita in Imperial County is 11.96. Threshold of significance is 85% of Regional Average

Project TAZ



Legend

TAZ

140#### TAZ Number

Project Location

TAZ Within 1 Mile Radius

(#.##) Home-Based VMT/Capita

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SOURCE: Imperial County Transportation Model - Base Year 2014

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VMT Per Capita Map

Exhibit 3

4 EXISTING TRANSPORTATION CONDITIONS

4.1 SURROUNDING ROADWAY NETWORK

The characteristics of the roadway system in the vicinity of the project site are described below:

Imperial Avenue (SR-86) is oriented in the north-south direction and is currently constructed as a 4-lane Divided Arterial (Code 5). The ultimate classification is a 6-lane Arterial Lanes (Code 7) per the City of El Centro General Plan Circulation Element. Raised medians are provided for the length of the corridor with dedicated left turn lanes at signalized intersections. Within the study area, the posted speed limit is 55 miles per hour (MPH) in the northbound direction and 45 MPH southbound. On-street parking is prohibited in both directions within the study area. There are no bike lanes or sidewalks provided within the study area.

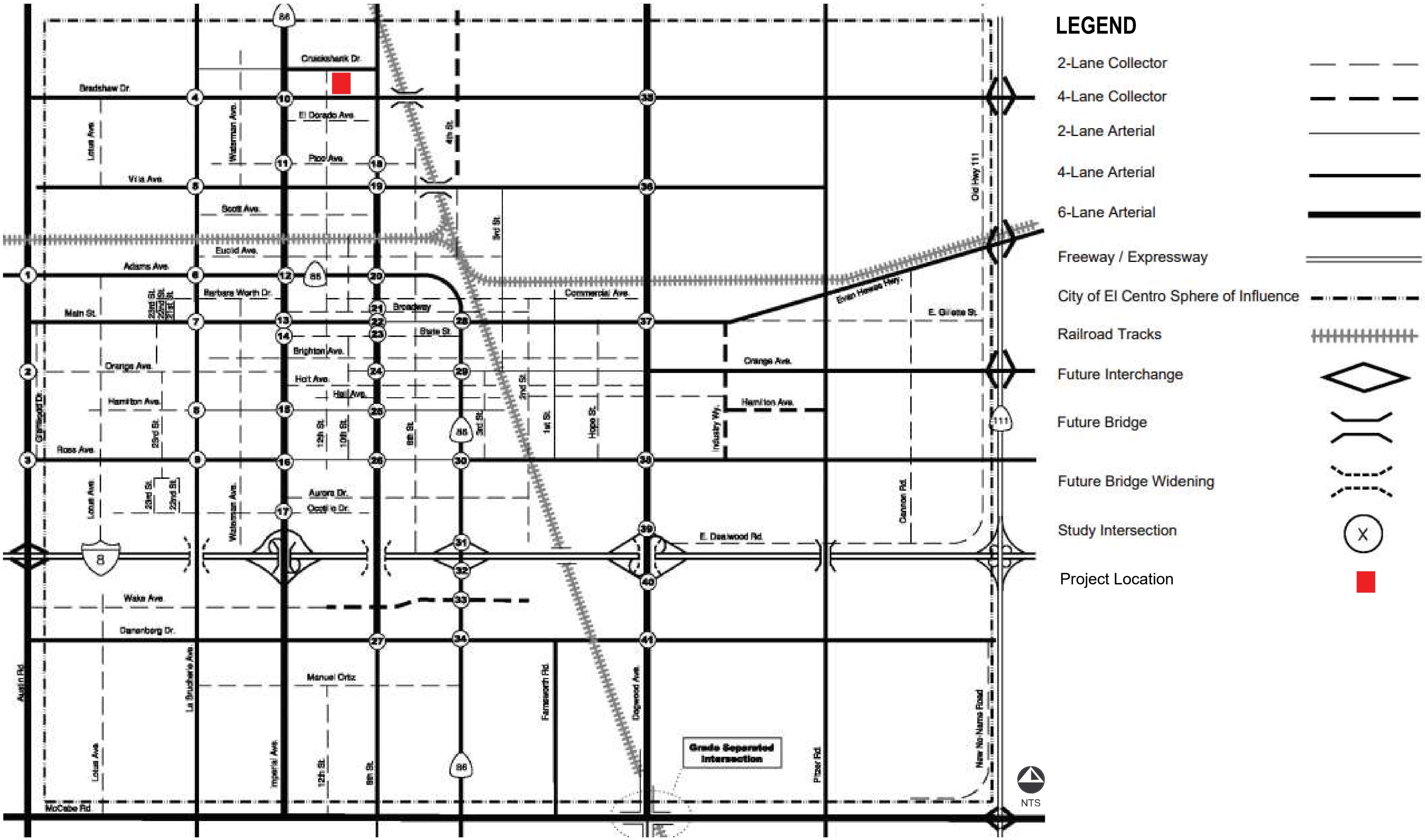
Cruickshank Drive is oriented in the east-west direction and is classified as a 2-lane Arterial (Code 3) west of Imperial Avenue and a 4-lane Divided Arterial (Code 5) east of Imperial Avenue per the City of El Centro General Plan Circulation Element. On-street parking is prohibited in both directions within the study area. Class II bike lanes and sidewalks are provided on both sides of the roadway.

Bradshaw Avenue is oriented in the east-west direction and is currently constructed as a 2-lane undivided collector (Code 2). The ultimate classification is a 4-lane Divided Arterial (Code 5) per the City of El Centro General Plan Circulation Element. On-street parking is prohibited in both directions within the study area. Bike lanes are not provided; however, sidewalks are provided on the north side of the roadway.

8th Street is oriented in the north-south direction and is currently constructed as a 2-lane roadway north of the railroad tracks, a 4-lane Divided Arterial (Code 2) between the railroad tracks and El Dorado Avenue and a 4-lane Undivided Arterial (Code 4) south of El Dorado Avenue. Two-way left turn-lanes are provided between Cruickshank Drive and Bradshaw Avenue. The ultimate classification is a 4-lane Divided Arterial (Code 5) per the City of El Centro General Plan Circulation Element. Within the study area, the posted speed limit is 40 MPH. On-street parking is prohibited in both directions within the study area. Class II bike lanes are provided north of El Dorado and sidewalks are provided on the both sides of the roadway. Vehicular access will be provided via a new project driveway on 8th Street.

10th Street is oriented in a north-south direction and is currently constructed as a 2-lane Local roadway between Cruickshank Drive and Bradshaw Avenue. The posted speed limit is 25 MPH. On-street parallel parking is permitted along both sides of the road. Class II bike lanes are not provided along this road. Sidewalks are provided on both sides of the road. Two new project driveways will be provided along the east side of 10th Street for vehicular access to the project site.

Exhibit 4 shows the *City of El Centro General Plan Buildout Circulation Element Future Road Network*.



SOURCE: City of El Centro General Plan, 2013

City of El Centro General Plan
Buildout Circulation Element Future Road Network

Exhibit 4

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4.2 ACTIVE TRANSPORTATION

4.2.1 Pedestrian Facilities

4.2.1.1 Sidewalks

Imperial Avenue (SR-86) – Within the study area, there are no sidewalks provided on either side of Imperial Avenue.

Cruickshank Drive – Sidewalks are provided on both sides of Cruickshank Drive between Waterman Avenue and 8th Street. To the east of Waterman, there is a gap in the sidewalk between La Brucherie Road and Waterman Avenue (approximately 0.25 miles) on the north side of the street, however continuous sidewalks are provided on the south side of the street.

Bradshaw Avenue – Sidewalks are provided on both sides of Bradshaw Avenue between La Brucherie Road and Imperial Avenue (SR-86); however, there is an approximately 430' gap on the south side of the street to the west of Waterman Avenue. Between Imperial Avenue (SR-86) and 8th Street, sidewalks are only provided on the north side of the street.

8th Street – Sidewalks are provided on both sides of 8th Street south of Bradshaw Avenue. Between Bradshaw Avenue and the City limits to the north, sidewalks are only provided on the west side of 8th Street.

10th Street – Sidewalks are provided on both sides of 10th Street between Cruickshank Drive and Bradshaw Avenue.

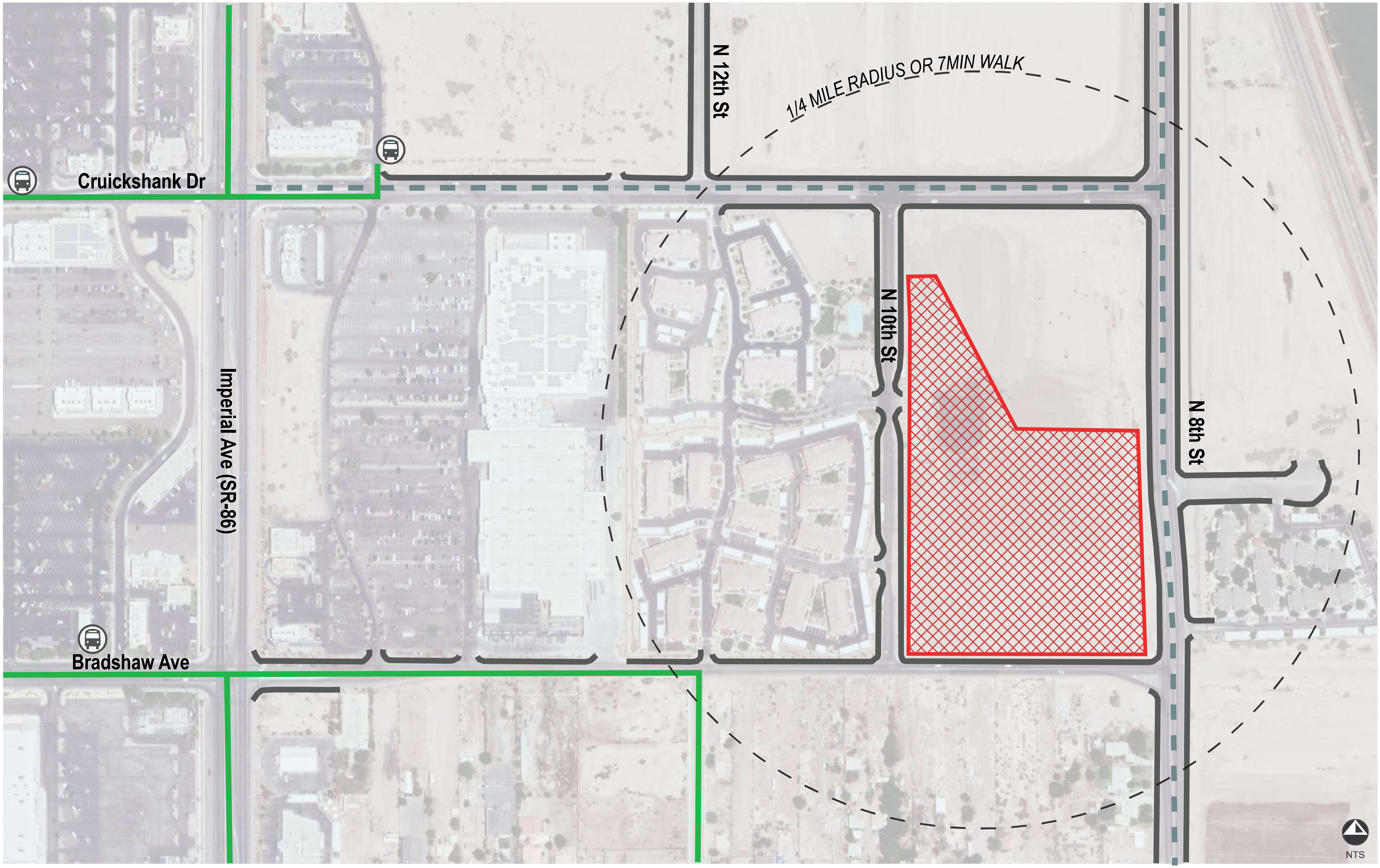
Exhibit 5 shows the sidewalks that are provided within the study area.

4.2.1.2 Crosswalks

Standard marked crosswalks are provided at all signalized intersections. At the intersections of Imperial Avenue (SR-86) and Cruickshank Drive and at Imperial Avenue (SR-86)/Bradshaw Avenue, east/west crossings across Imperial Avenue are only provided on the south leg of the intersection. Similarly, at the intersection of 8th Street/Cruickshank Drive, east/west crossings are only provided on the south leg of the intersection.

4.2.1.3 ADA Facilities

All of the signalized intersections within the study area have controlled crossings; however, these crossings are only partially ADA compliant. The pedestrian ramps on Imperial Avenue (SR-86) are lacking truncated domes.



Legend

= Bus Stop
= Project Location
= IVT Green Line
= Sidewalk
= Bike Lane

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SOURCE: Imperial County Transportation Model - Base Year 2014

Existing Pedestrian, Bicycle, and Transit Facilities

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Exhibit 5

4.2.2 Existing Bicycle Facilities

Exhibit 5 shows the existing bicycle facilities within the project study area. As shown, there are currently no bicycle facilities provided along the project's frontage on 10th Street and Bradshaw Avenue. As described below, there are three basic types of bikeways, known under state standards as Class I, II, and III bike facilities.

Trail or Path – Class I Bikeway is a facility totally separated from the roadway with dedicated space for bikes, where cars are prohibited. They are often multi-use facilities for bicyclists and pedestrians, 8-12 feet wide. There are no Class I facilities in the study area.

Bike Lane – Class II Bikeway is an on-street facility with dedicated space for bicyclists, usually near the right side of the street. Bike lanes are provided within the paved roadway, approximately 4-5 feet wide, and designated by striping and signage.

Bike Route – Class III Bikeway is an on-street facility that shares space with cars and may be designated with a "sharrow" bicycle marking. On Class III facilities, bicycle usage is secondary to vehicles.

Within the study area, Class II bike lanes are provided on Cruickshank Drive and 8th Street. According to the City of El Centro *Bicycle Master Plan* (October 2010) Imperial Avenue (SR-86) is classified as a Class III Bicycle Route within the study area; however, there are no signs or markings posted on the roadway stating such.

4.2.3 Existing Transit Facilities

Imperial Valley Transit (IVT) operates the local bus service within the City of El Centro and provides access to employment centers, shopping centers, hospitals, the library, government offices, as well as Imperial Valley College.

The El Centro Green Line travels along Bradshaw Avenue as shown in **Exhibit 5** which allows transfer at the transit station located at State Street & 7th Street. This transit station also serves the city-wide Blue Line as well as other regional IVT bus routes connection Imperial, Brawley, Calexico and the rest of Imperial Valley. As shown in **Exhibit 5**, the closest bus stop to the project site is located on Cruickshank Drive approximately 500' east of Imperial Avenue (SR-86).

Due to COVID-19, reduced services were implemented in March 2020, until further notice. According to the IVT Riders Guide, the Green Line follows the Saturday schedule on weekdays providing service between 7:38 AM and 5:03 PM.

5 LOCAL MOBILITY ANALYSIS (LMA)

5.1 LMA ANALYSIS METHODOLOGY

5.1.1 Intersection Analysis Methodology

Level of Service (LOS) is commonly used as a qualitative description of intersection operation and is based on the capacity of the travel lanes approaching the intersection, the volume of traffic using the intersection, and the average vehicle delay. The intersection analysis conforms to the operational analysis methodology outlined the *Highway Capacity Manual (HCM 6th Edition)* and performed utilizing *Synchro 10* traffic analysis software.

The *HCM* analysis methodology describes the operation of an intersection using a range of level of service from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on the corresponding stopped delay experienced per vehicle for study intersections as shown in **Table 3**.

For signalized intersections, signal timing data and parameters such as cycle lengths, splits, clearance intervals, etc. were obtained from the current signal timing data sheets provided by City staff and incorporated into the Synchro model. Synchro reports average vehicle delay for a signalized intersection, which correspond to a particular LOS, to describe the overall operation of an intersection.

Unsignalized intersection LOS for all-way stops and roundabouts is based on the average vehicle delay for all approaches. Average vehicle delay for one-way or two-way stop-controlled intersections is influenced by available gaps in traffic flow on the non-controlled approaches and LOS is based on the approach with the worst delay. The City of El Centro has adopted level of service “C” or better as the standard for acceptable operating conditions for intersections.

TABLE 3 - LEVEL OF SERVICE & DELAY RANGE

Level of Service	Control Delay (seconds/vehicle)		Description
	Signalized Intersections	Unsignalized Intersections	
A	≤ 10.0	≤ 10.0	Operates with very low delay and most vehicles do not stop.
B	> 10.0 to 20.0	> 10.0 to 15.0	Operates with good progression with some restricted movements.
C	> 20.0 to 35.0	>15.1 to 25.0	Operates with significant number of vehicles stopping with some backup and light congestion.
D	> 35.0 to 55.0	> 25.0 to 35.0	Operates with noticeable congestion, longer delays occur, and many vehicles stop.
E	> 55.0 to 80.0	> 35.1 to 50.0	Operates with significant delay, extensive queuing and unfavorable progression.
F	> 80.0	> 50.0	Operates at a level that is unacceptable to most drivers. Arrival rates exceed capacity of the intersection. Extensive queuing occurs.

Source: Highway Capacity Manual (HCM) 6th Edition.

5.1.1 Roadway Segment Analysis Methodology

The basis for roadway segment analysis is the relationship between the measured daily traffic volume and the Level of Service (LOS) capacity thresholds established according to roadway classifications. The analysis results provide a planning-level assessment of whether a segment is under, approaching, or over capacity. The City of El Centro has adopted level of service “C” or better as the standard for acceptable operating conditions for roadway segments. **Table 4** presents the roadway segment capacity thresholds by LOS contained in the El Centro Circulation Element.

TABLE 4 - LOS CRITERIA FOR ROADWAY SEGMENTS

Road Classification	Code	Level of Service Capacity (ADT)				
		LOS A	LOS B	LOS C	LOS D	LOS E
10 - Lane Freeway	10F	64,000	99,000	139,000	160,000	182,000
8-Lane Freeway	8F	51,000	79,000	112,000	136,000	146,000
6-Lane Freeway	6F	39,000	59,000	85,000	102,000	110,000
8-Lane Expressway	8E	35,000	54,000	75,000	90,000	98,000
6-Lane Expressway	6E	28,000	42,000	56,000	67,000	74,000
4-Lane Freeway	4F	26,000	40,000	57,000	69,000	74,000
8-Lane Divided Arterial	9	40,000	47,000	54,000	61,000	68,000
6-Lane Divided Arterial	7	32,000	38,000	43,000	49,000	54,000
4-Lane Expressway	4E	18,000	27,000	36,000	45,000	50,000
4-Lane Divided Arterial	5	22,000	25,000	29,000	32,500	36,000
4-Lane Undivided Arterial	4	16,000	19,000	22,000	24,000	27,000
2-Lane Rural Highway	2R	4,000	8,000	12,000	17,000	25,000
2-Lane Arterial	3	11,000	12,500	14,500	16,000	18,000
2-Lane Collector	2	6,000	7,500	9,000	10,500	12,000
2-Lane Local	1	1,200	1,400	1,600	1,800	2,000

Source: City of El Centro General Plan Circulation Element: Table C-3

5.1.2 Thresholds of Improvements

As stated previously, the City of El Centro has adopted level of service “C” or better as the standard for acceptable operating conditions for intersections and roadway segments. Based on this goal, an improvement would be required at an intersection or roadway segment if:

- The addition of project related traffic to an intersection or roadway segment operating acceptably without the project, causes the facility to degrade to and LOS D, E or F with the addition of project related traffic, improvements are required to improve operations to LOS C or better.
- At any signalized intersection that is operating at LOS D, E or F without the project, where the addition of project related traffic increases delay by 2 seconds or more, improvements are required to offset the increase in delay.
- At any roadway segment that is operating at LOS D, E or F without the project, where the addition of project related traffic increases the volume-to-capacity (V/C) ratio by more than 0.02.

5.1.3 Caltrans Facilities

Within the study area, Imperial Avenue (SR-86) is a Caltrans facility. Two study intersections including Cruickshank Drive / Imperial Avenue (SR-86) and Bradshaw Avenue / Imperial Avenue (SR-86) are operated by Caltrans. For study purposes, operational standards and need for improvements established for the s City were applied to these two study intersections within Caltrans jurisdiction. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System (SHS) facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that lead agency consult with Caltrans to determine appropriate target LOS. For purposes of this analysis, LOS C is considered the standard for acceptable operating conditions.

5.2 STUDY AREA

The study evaluates the following eleven (11) intersections during the AM/PM peak hours within the study area:

1. Cruickshank Drive / Imperial Avenue (SR-86)
2. Cruickshank Drive / 12th Street
3. Cruickshank Drive / 10th Street
4. Cruickshank Drive / 8th Street
5. Bradshaw Avenue / Imperial Avenue (SR-86)
6. Bradshaw Avenue / 12th Street
7. Bradshaw Avenue / 10th Street
8. Bradshaw Avenue / 8th Street
9. 10th Street / Project Driveway
10. 8th Street / Project Driveway
11. 8th Street / El Dorado Apt Driveway

The study also evaluates the following nine (9) roadway segments for average daily (24-hour) traffic volumes in the vicinity of the project site:

A. Cruickshank Drive – between 12th Street and 10th Street
B. Cruickshank Drive – between 10th Street and 8th Street
C. Bradshaw Avenue – between 12th Street and 10th Street
D. Bradshaw Avenue – between 10th Street and 8th Street
E. 8th Street – between Cruickshank Drive and Project Driveway
F. 8th Street – between Project Driveway and Bradshaw Avenue
G. 8th Street – South of Bradshaw Avenue
H. Imperial Avenue (SR-86) – between Cruickshank Drive and Bradshaw Avenue
I. Imperial Avenue (SR-86) – South of Bradshaw Avenue

Exhibit 6 shows the study locations.

The following scenarios will be evaluated as part of the LMA:

- Existing Conditions
- Existing Plus Project
- Opening Year 2022 Without Project Conditions
- Opening Year 2022 Plus Project Conditions
- Horizon Year 2040 Without Project Conditions
- Horizon Year 2040 Plus Project Conditions

Michael Baker coordinated with City staff on the study assumptions such as trip generation, trip distribution, study locations and scenarios, and study methodology which can be found in **Appendix B**.

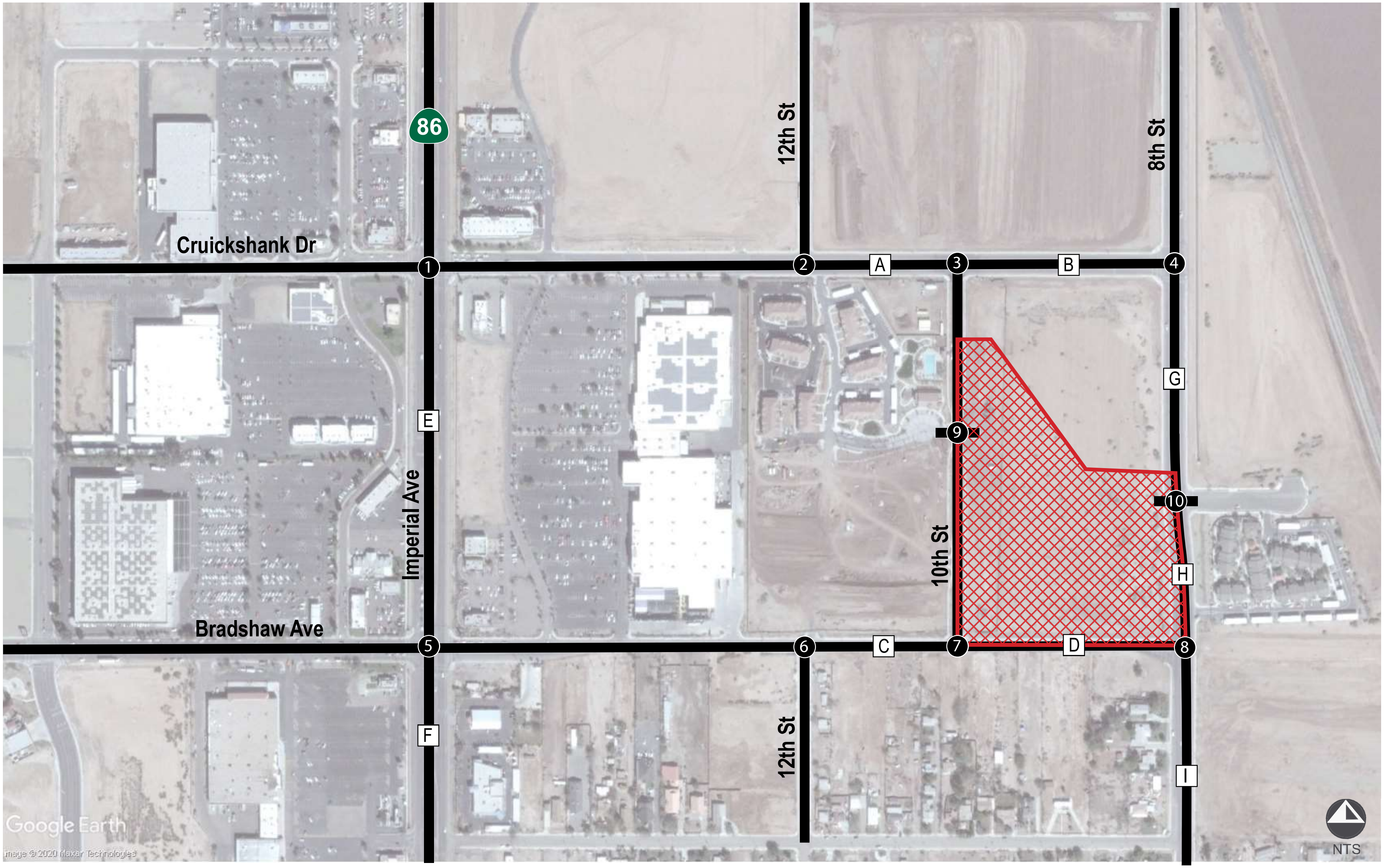
5.3 DATA COLLECTION

Due to COVID-19, transportation patterns at the time this study was prepared were not reflective of actual conditions and new traffic counts could not be collected. A Traffic Impact Analysis was completed for the project site by Linscott, Law & Greenspan (LLG) in October 2016 which includes traffic volume data collected on Tuesday, August 30, 2016. In addition, City staff provided MBI with daily traffic volumes obtained in 2019 for roadway segments within the study area (excluding Cruickshank Drive).

In order to estimate Existing 2020 AM/PM peak hour traffic volumes, cumulative project traffic assumed in the LLG TIA, which have subsequently been constructed and are fully occupied, were added to the 2016 traffic counts and a growth rate of 1% for four years was applied. Through coordination with City staff, it was determined this approach would provide the most conservative estimate of current traffic volumes within the study area.

Similarly, Existing daily traffic volumes were calculated based on the 2016 volumes from the LLG report using the same methodology mentioned above. The 2019 volumes obtained from the City were also factored up to 2020 and were determined to be conservatively higher. Therefore, the daily roadway segment analysis in this report utilize the 2019 City volumes with the exception of Cruickshank Drive where no volumes were available. For these study segments, the 2016 volumes from the LLG report were utilized.

Excerpts from the LLG Study including traffic count data are provided in **Appendix C**. Signal timing sheets for study intersections that are signalized are also included in Appendix C.



Legend

= Project Site

= Study Intersection

X = Study Segment

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Study Area

Exhibit 6

5.4 EXISTING CONDITIONS TRAFFIC ANALYSIS

5.4.1 Existing Intersection Evaluation

Exhibit 7 shows the Existing study intersection lane geometry. At the 8th Street/Project Driveway intersection, a dedicated right-turn lane is assumed in the southbound approach of the Existing Plus Project, Opening Year 2022 Plus Project, and Horizon Year 2040 Plus Project conditions analysis. However, the analysis results determined this intersection operates acceptably without the southbound right-turn lane.

Exhibit 8 shows the Existing daily and AM/PM peak hour traffic volumes at the study intersections.

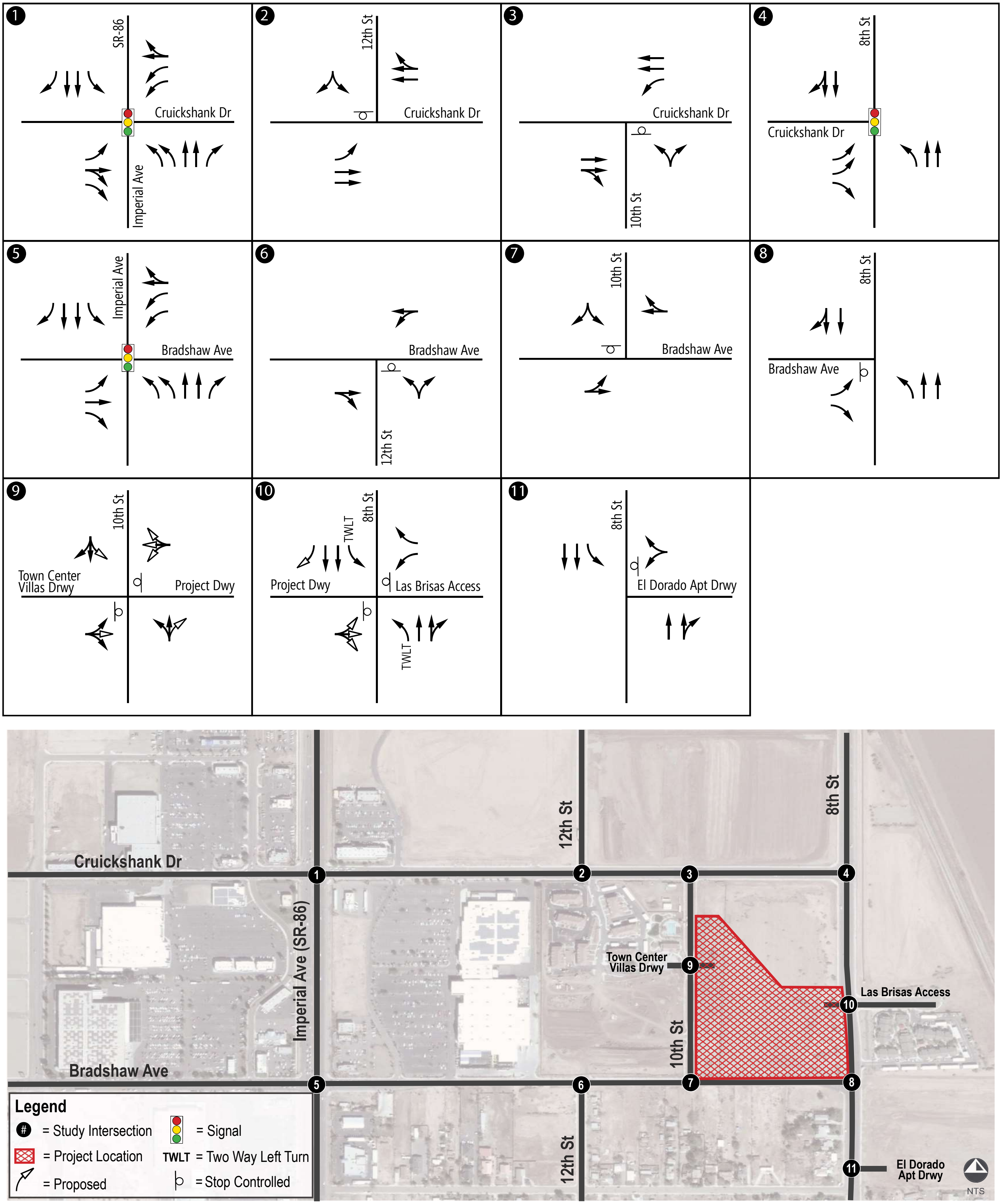
Table 5 summarizes Existing conditions AM/PM peak hour level of service for all study intersections. For unsignalized intersections, the minor approach delay is reported if the minor leg is a public street or project driveway. The City of El Centro has adopted level of service "C" (LOS C) or better as acceptable operating conditions for intersections. Level of service D, E or F is considered to operate below the acceptable standard. Detailed HCM analysis worksheets are contained in **Appendix D**. The analysis shows all study intersections are currently operating at LOS C or better except for the following intersections:

- Imperial Avenue (SR-86) / Cruickshank Drive — LOS D in AM/PM Peak Hour
- Imperial Avenue (SR-86) / Bradshaw Avenue — LOS D in PM Peak Hour only

TABLE 5 – EXISTING CONDITIONS AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection	Traffic Control	Existing Conditions AM Delay[1] - LOS	Existing Conditions PM Delay[1] - LOS
1 - Imperial Avenue (SR-86) / Cruickshank Drive	Signal	**43.4 - D**	**52.3 - D**
2 - Cruickshank Drive / 12th Street	TWSC	8.8 - A	8.9 - A
3 - Cruickshank Drive / 10th Street	TWSC	9.5 - A	11.2 - B
4 - Cruickshank Drive / 8th Street	Signal	12.1 - B	16.4 - B
5 - Imperial Avenue (SR-86) / Bradshaw Avenue	Signal	27.9 - C	**38.6 - D**
6 - Bradshaw Avenue / 12th Street	TWSC	9.6 - A	10.7 - B
7 - Bradshaw Avenue / 10th Street	TWSC	9.1 - A	9.5 - A
8 - Bradshaw Avenue / 8th Street	OWSC	11.4 - B	12.3 - B
9 - 10th Street / Villa Way - Project Driveway	TWSC	7.3 - A	7.4 - A
10 - 8th Street / Project Driveway	OWSC	11.1 - B	11.5 - B
11 - 8th Street / El Dorado Family Apt. Driveway	OWSC	Future Intersection	

Note: Deficient intersection operation indicated in **bold**.
[1] Average seconds of delay per vehicle.
LOS = level of service.
TWSC = Two-Way Stop Control
OWSC = One-Way Stop Control



Existing Intersection Lane Geometry

Exhibit 7

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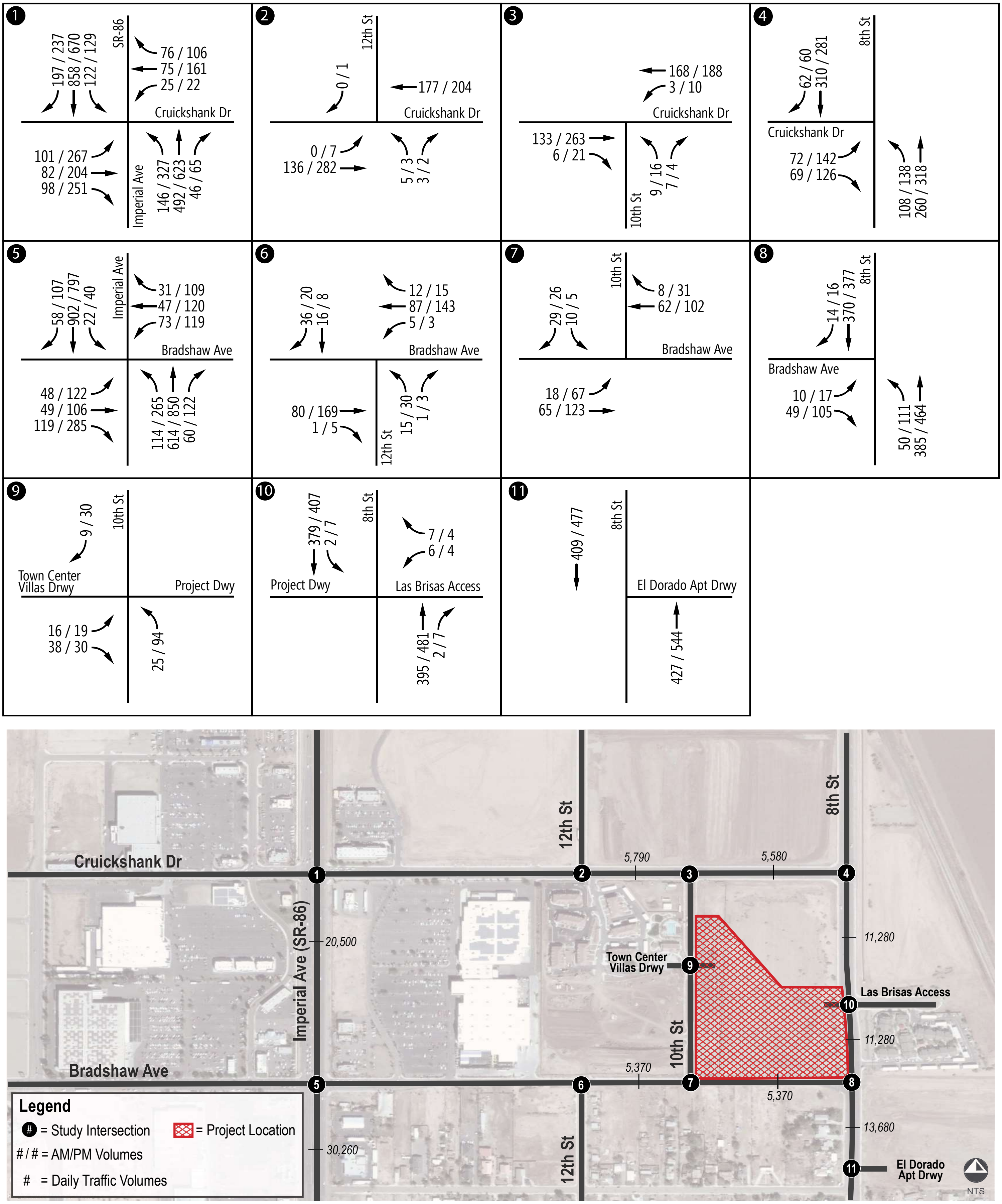

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Existing Daily AM/PM Peak Hour Intersection Volumes

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Exhibit 8

5.4.2 Existing Roadway Segment Evaluation

Operating conditions and LOS for roadway segments are calculated based on the capacity of the roadway determined by the existing functional classification and existing daily traffic volumes. **Table 6** summarizes existing conditions average daily traffic level of service for all study roadway segments based on the threshold table. As shown, all study roadway segments are currently operating LOS C or better.

TABLE 6 – EXISTING CONDITIONS ROADWAY SEGMENT LOS

Roadway	Segment	Classification	LOS E Capacity	Existing Condition		
				ADT	V/C	LOS
Cruickshank Drive	12th St. to 10th St.	4-Lane Divided Arterial	36,000	5,790	0.16	A
	10th St. to 8th St.	4-Lane Divided Arterial	36,000	5,580	0.16	A
Bradshaw Avenue	12th St. to 10th St.	2-Lane Collector	12,000	5,370	0.45	A
	10th St. to 8th St.	2-Lane Collector	12,000	5,370	0.45	A
8th Street	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	11,280	0.31	A
	Project Driveway to Bradshaw Ave.	4-Lane Divided Arterial	36,000	11,280	0.31	A
	Bradshaw Ave. to El Dorado Ave.	4-Lane Undivided Arterial	27,000	13,680	0.51	A
Imperial Avenue (SR-86)	Cruickshank Dr. to Bradshaw Ave.	4-Lane Divided Arterial	36,000	20,500	0.57	A
	South of Bradshaw Ave.	6-Lane Divided Arterial	54,000	30,260	0.56	A

Note: Deficient roadway segment operations shown in **bold**
ADT= Average Daily Traffic
LOS= Level of Service
V/C= Volume to Capacity Ratio

5.5 PROPOSED PROJECT

The project proposes a rezone of the property from CG-General Commercial to R3-Multiple Family Residential to allow for development of a 180-unit apartment complex in multiple buildings on a 19.3-acre site. A General Plan Amendment will also be required to change the existing General Plan land use designation from General Commercial to High Density Residential. The project site is currently vacant and undeveloped. Vehicular access to the project site will be provided via one full access driveway on 8th Street and a full access driveway at the southern driveway on 10th Street. The northern driveway on 10th Street will be configured as an exit only driveway. All three project access points will be gated with key card access to residents.

5.5.1 Project Forecast Trip Generation

In order to calculate the vehicular trips forecast to be generated by the project, the *Institute of Transportation Engineers (ITE) 10th Edition Trip Generation Manual* rates were utilized as summarized in **Table 7.**

TABLE 7 – ITE TRIP GENERATION RATES

Land Use	ITE Code [1]	Daily Trip Rate	AM Peak Hour Rate		PM Peak Hour Rate	
			Total	In : Out	Total	In : Out
Multi-Family Residential	220	7.33 /DU	0.46 /DU	23% 77%	0.56 /DU	63% 37%

[1] Source: ITE Trip Generation Manual, 10th Edition. Rates shown are based on fitted curve equation.

Table 8 summarizes the project trip generation using the rates shown in **Table 6**. As shown, the proposed project is forecast to generate approximately 1,320 daily trips with 83 AM peak hour trips (19 in / 64 out) and 100 PM peak hour trips (63 in / 37 out).

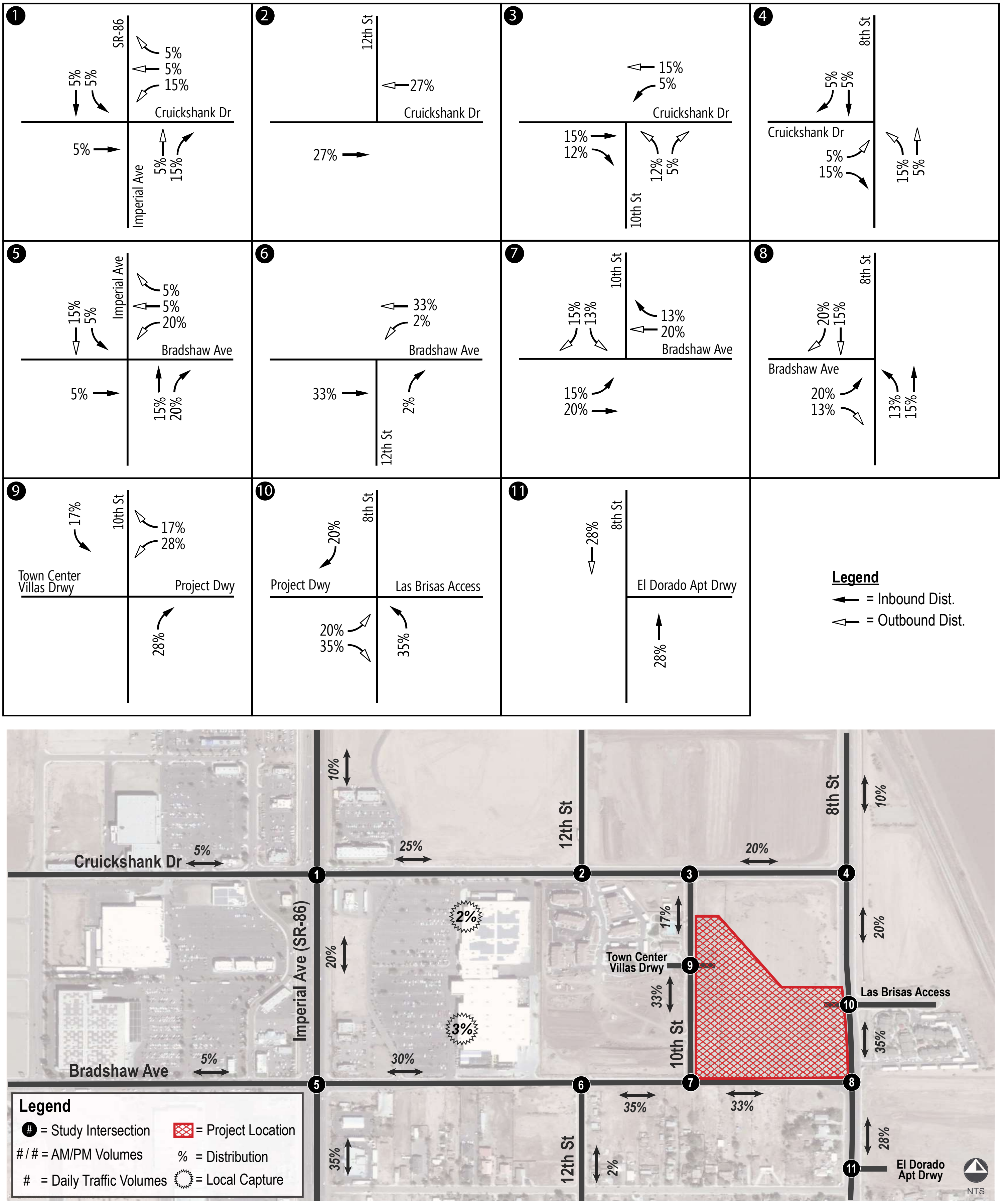
TABLE 8 – PROPOSED PROJECT TRIP GENERATION

Land Use	Intensity	Daily Trips	AM Peak Hour Trips		PM Peak Hour Trips	
			Total	In : Out	Total	In : Out
Multi-Family Residential	180 DU	1320	83	19 : 64	100	63 : 37

Notes:
DU = Dwelling Unit

5.5.2 Trip Distribution & Trip Assignment of Proposed Project

Project trips were distributed onto the surrounding roadway network based on existing travel patterns using existing traffic count data. **Exhibit 9** shows the forecast trip percent distribution of the proposed project within the study area. As shown, 45% of the project traffic is expected to use the driveways on 10th Street and 55% of project traffic is assumed to use the main project access via 8th Street. 20% of traffic is estimated to travel north on Imperial Avenue (SR-86) and 8th Street while 65% is estimated to travel south towards Interstate 8. **Exhibit 10** shows the corresponding forecast assignment of AM and PM peak hour project-generated trips assuming the trip percent distribution.



Project Distribution

Exhibit 9

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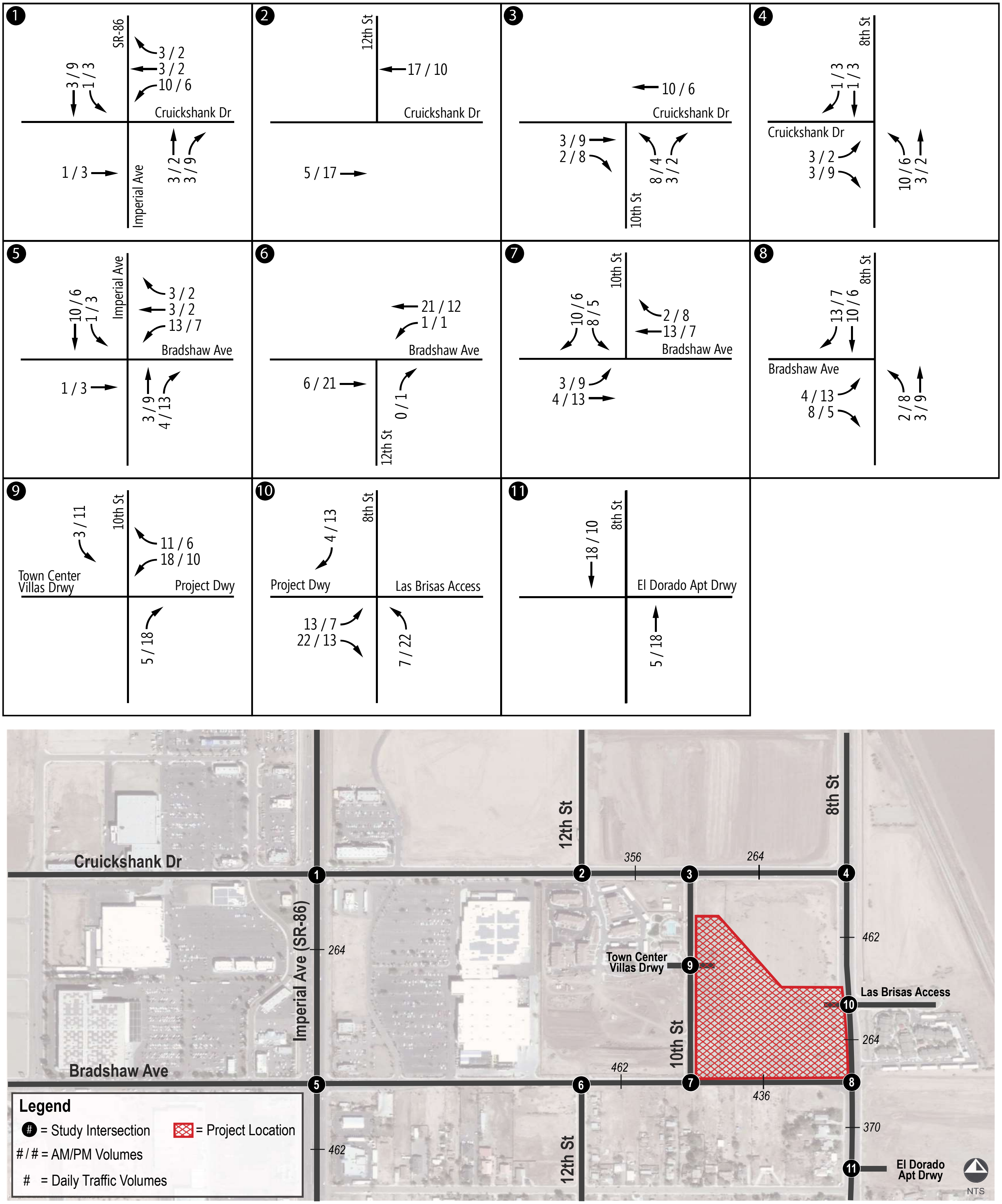

Town Center Village Proposed Trip Assignment

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Exhibit 10

5.6 EXISTING PLUS PROJECT ANALYSIS

Existing Plus Project traffic volumes were derived by adding trips forecast to be generated by the proposed project to existing traffic volumes. **Exhibit 11** shows the Existing Plus Project daily traffic volumes and AM / PM peak hour volumes within the study area.

5.6.1 Existing Plus Project Intersection Evaluation

Table 9 summarizes Existing and Existing Plus Project AM/PM peak hour level of service comparison for all study intersections. At the 8th Street/Project Driveway intersection, a dedicated right-turn lane is assumed in the southbound approach of the Existing Plus Project conditions analysis. However, this intersection operates acceptably without the southbound right-turn lane. Detailed HCM analysis worksheets for Existing Plus Project conditions are contained in **Appendix E**.

TABLE 9 – EXISTING & EXISTING PLUS PROJECT AM/PM PEAK HOUR INTERSECTION LOS COMPARISON

Study Intersection	Traffic Control	Existing Conditions		Existing Plus Project Conditions		Change in Delay (sec.)		Improvements Warranted?	
		AM	PM	AM	PM				
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM	AM	PM
1 - SR-86 / Cruickshank Drive	Signal	**43.4 - D**	**52.3 - D**	**44.0 - D**	**52.7 - D**	0.6	0.4	No	No
2 - Cruickshank Drive / 12th Street	TWSC	8.8 - A	8.9 - A	8.9 - A	8.9 - A	0.1	0.0	No	No
3 - Cruickshank Drive / 10th Street	TWSC	9.5 - A	11.2 - B	9.8 - A	11.4 - B	0.3	0.2	No	No
4 - Cruickshank Drive / 8th Street	Signal	12.1 - B	16.4 - B	12.9 - B	17.8 - B	0.8	1.4	No	No
5 - SR-86 / Bradshaw Road	Signal	27.9 - C	**38.6 - D**	28.3 - C	**39.4 - D**	0.4	0.8	No	No
6 - Bradshaw Road / 12th Street	TWSC	9.6 - A	10.7 - B	9.8 - A	11.0 - B	0.2	0.3	No	No
7 - Bradshaw Road / 10th Street	TWSC	9.1 - A	9.5 - A	9.3 - A	9.9 - A	0.2	0.4	No	No
8 - Bradshaw Road / 8th Street	OWSC	11.4 - B	12.3 - B	11.7 - B	12.9 - B	0.3	0.6	No	No
9 - 10th Street / Villa Way - Project Driveway	TWSC	7.3 - A	7.4 - A	9.0 - A	10.0 - B	1.7	2.6	No	No
10 - 8th Street / Project Driveway	OWSC	11.1 - B	11.5 - B	13.0 - B	14.5 - B	1.9	3.0	No	No
11 - 8th Street / El Dorado Family Apt. Driveway	OWSC	Future Intersection		Future Intersection		N/A	N/A	No	No

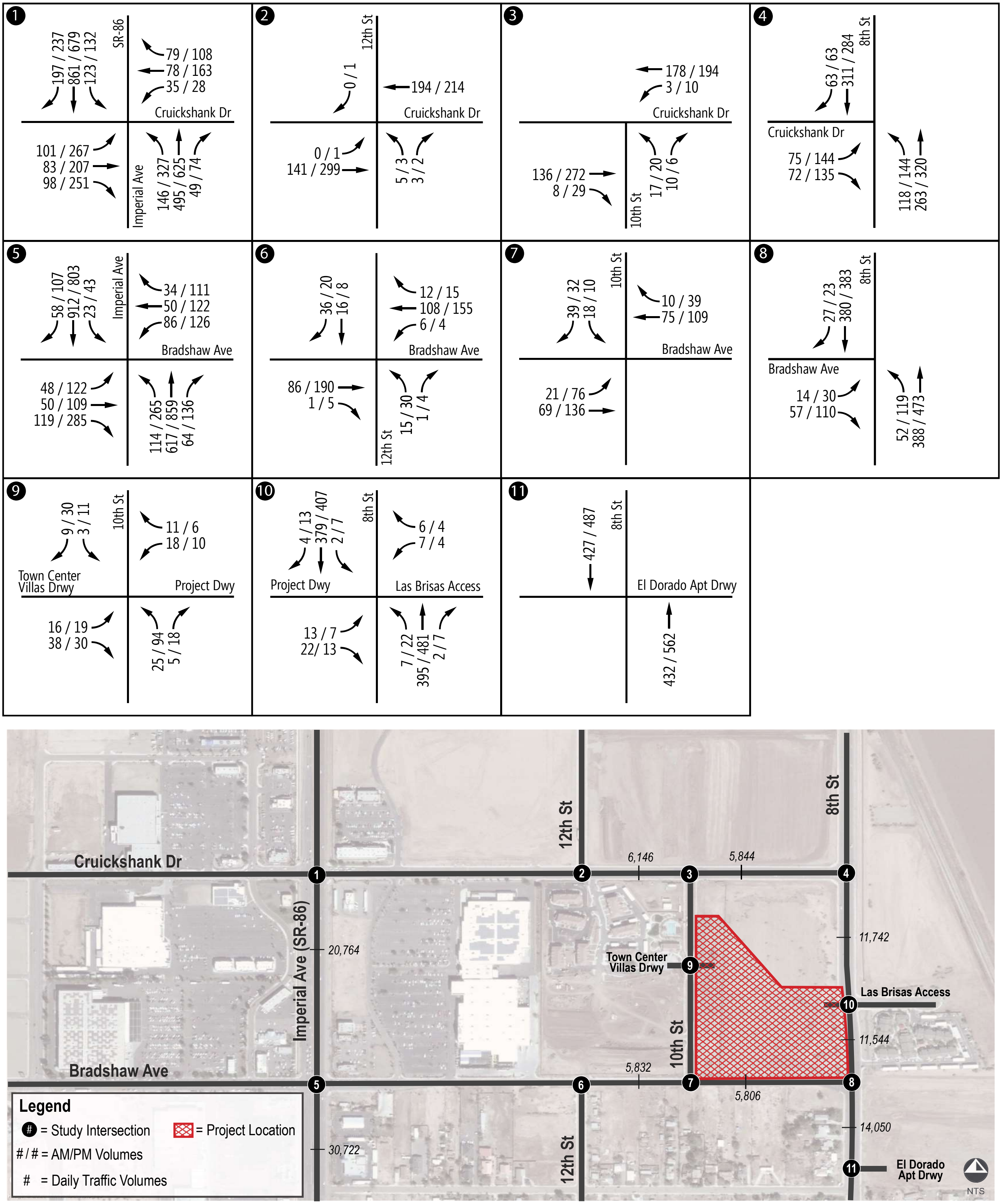
Note: Deficient intersection operation indicated in **bold**.
[1] Seconds of delay per vehicle. TWSC = Two-Way Stop Control
LOS = level of service. OWSC = One-Way Stop Control

As shown, most study intersections are forecast to operate at LOS C or better during the AM/PM peak hours for the Existing Plus Project condition except for the following intersections:

- Imperial Avenue (SR-86) / Cruickshank Drive LOS D in the AM/PM Peak Hour
- Imperial Avenue (SR-86) / Bradshaw Avenue LOS D in the PM Peak Hour only

According to the City's improvements standards, an improvement would be warranted at an intersection if the addition of project related traffic to an intersection operating acceptably without the project, causes the facility to degrade to a LOS D, E or F with the addition of project related traffic. If a study intersection is operating at LOS D, E or F without the project and the addition of project related traffic increases delay by 2 seconds or more, than improvements are required to offset the increase in delay.

As shown in **Table 9**, project related traffic does not increase the change in delay by more than 2 seconds. Therefore, the project is not required to provide improvements to any of the study intersections.



Existing Plus Project
Daily and AM/PM Peak Hour Traffic Volumes

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Exhibit 11

5.6.2 Existing Plus Project Roadway Segment Evaluation

Operating conditions for roadway segments are calculated based on the capacity of the roadway determined by the existing functional classification and daily traffic volumes. **Table 10** provides a comparison of Existing and Existing Plus Project conditions average daily traffic level of service for all study roadway segments based on the V/C ratio.

TABLE 10 – EXISTING & EXISTING PLUS PROJECT ROADWAY SEGMENT LOS COMPARISON

Roadway	Segment	Classification (No. Lanes)	LOS E Capacity	Existing			Existing Plus Project			Δ V/C	Improv. Warranted?
				ADT	V/C	LOS	ADT	V/C	LOS		
Cruickshank Drive	12th St. to 10th St.	4-Lane Divided Arterial	36,000	5,790	0.16	A	6,146	0.17	A	0.010	No
	10th St. to 8th St.	4-Lane Divided Arterial	36,000	5,580	0.16	A	5,844	0.16	A	0.007	No
Bradshaw Avenue	12th St. to 10th St.	2-Lane Collector	12,000	5,370	0.45	A	5,832	0.49	A	0.039	No
	10th St. to 8th St.	2-Lane Collector	12,000	5,370	0.45	A	5,806	0.48	A	0.036	No
8th Street	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	11,280	0.31	A	11,742	0.33	A	0.013	No
	Bradshaw Ave. to El Dorado Ave.	4-Lane Undivided Arterial	27,000	11,280	0.31	A	11,544	0.32	A	0.007	No
Imperial Avenue (SR-86)	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	13,680	0.51	A	14,050	0.52	A	0.014	No
	Cruickshank Dr. to Project Driveway	6-Lane Divided Arterial	54,000	20,500	0.57	A	20,764	0.58	A	0.007	No
	South of Bradshaw Ave.	6-Lane Divided Arterial	54,000	30,260	0.56	A	30,722	0.57	A	0.009	No

Note: Deficient roadway segment operations shown in **bold**.
LOS= Level of Service
V/C= Volume to Capacity Ratio
Δ= Difference

According to the City's standards, an improvement would be warranted on a roadway segment if the addition of project related traffic to the segment operating acceptably without the project, causes the facility to degrade to a LOS D, E or F with the addition of project related traffic. If a study segment is operating at LOS D, E or F without the project and the addition of project related traffic increases the volume-to-capacity ratio by 0.02 or more, than improvements are required.

As shown in **Table 10**, project related traffic does not increase the change in V/C ratio by more than 0.02. Therefore, the project is not required to provide improvements to any of the study roadway segments.

5.7 OPENING YEAR 2022 WITHOUT PROJECT ANALYSIS

This scenario evaluates study intersections and roadway segments under the Opening Year 2022 Without Project conditions which represents existing plus cumulative (pending or approved projects) traffic. This analysis assumes the project will be constructed and occupied by Year 2022.

5.7.1 Cumulative Traffic

Based on coordination with City staff, seven cumulative projects were determined to add sufficient traffic to the study area for inclusion within the analysis. The following seven cumulative projects are anticipated to add traffic to the study area as noted below.

- **El Dorado Apartments (Phase 1)** is located at 1805 North 8th Street. For Phase 1, the project plans to construct 24 multi-family dwelling units with a community center which is expected to generate 140 daily vehicle trips with 12 AM and 17 PM peak hour trips. The project site plans develop 80 additional apartments in Phase 2 and 56 additional apartments in Phase 3. However, construction of the remaining 136 dwelling units are not expected to be completed by the proposed project's opening year 2022. Therefore, only phase 1 is assumed in the Opening Year 2022 scenario and the remaining traffic generated by Phase 1 and 2 is assumed in the Horizon Year 2040 analysis.

- **Imperial Valley College Tiny Home Village** is located at 1998 North 12th Street. The project consists of 27 dwelling units which is expected to generate 135 daily vehicle trips with 7 AM and 12 PM peak hour trips.

- **El Centro Public Library** is a new 19,295 square foot library to be constructed at 1198 North Imperial Avenue. The library is expected to generate 1,379 daily vehicle trips with 18 AM and 157 PM peak hour trips.

- **Countryside II Apartments** is located at 1776 West Adams Avenue. The project plans to construct 56 apartments which is expected to generate 382 daily vehicle trips with 27 AM and 35 PM peak hour trips.

- **First Responders Park** is a new public park located at 1906 North Waterman Avenue. The new park would include a 14-space parking lot for a new ADA compatible playground, and other play/workout features. The park is expected to generate 92 daily vehicle trips with negligible AM peak hour trips and 23 PM peak hour trips.

- **Carlos Aguilar Park** is an existing park, upgraded to contain one additional soccer field. The park also plans to re-establish a 29-space parking lot, for a total of two soccer fields and basketball court. The park is expected to generate 46 daily vehicle trips with negligible AM peak hour trips and 12 PM peak hour trips.

- **Victoria Ranch** is located at the southwest corner of Aten Road and Cross Road in the City of Imperial. The project plans to construct 153 single family dwelling units which is expected to generate 1,538 daily vehicle trips with 113 AM and 153 PM peak hour trips.

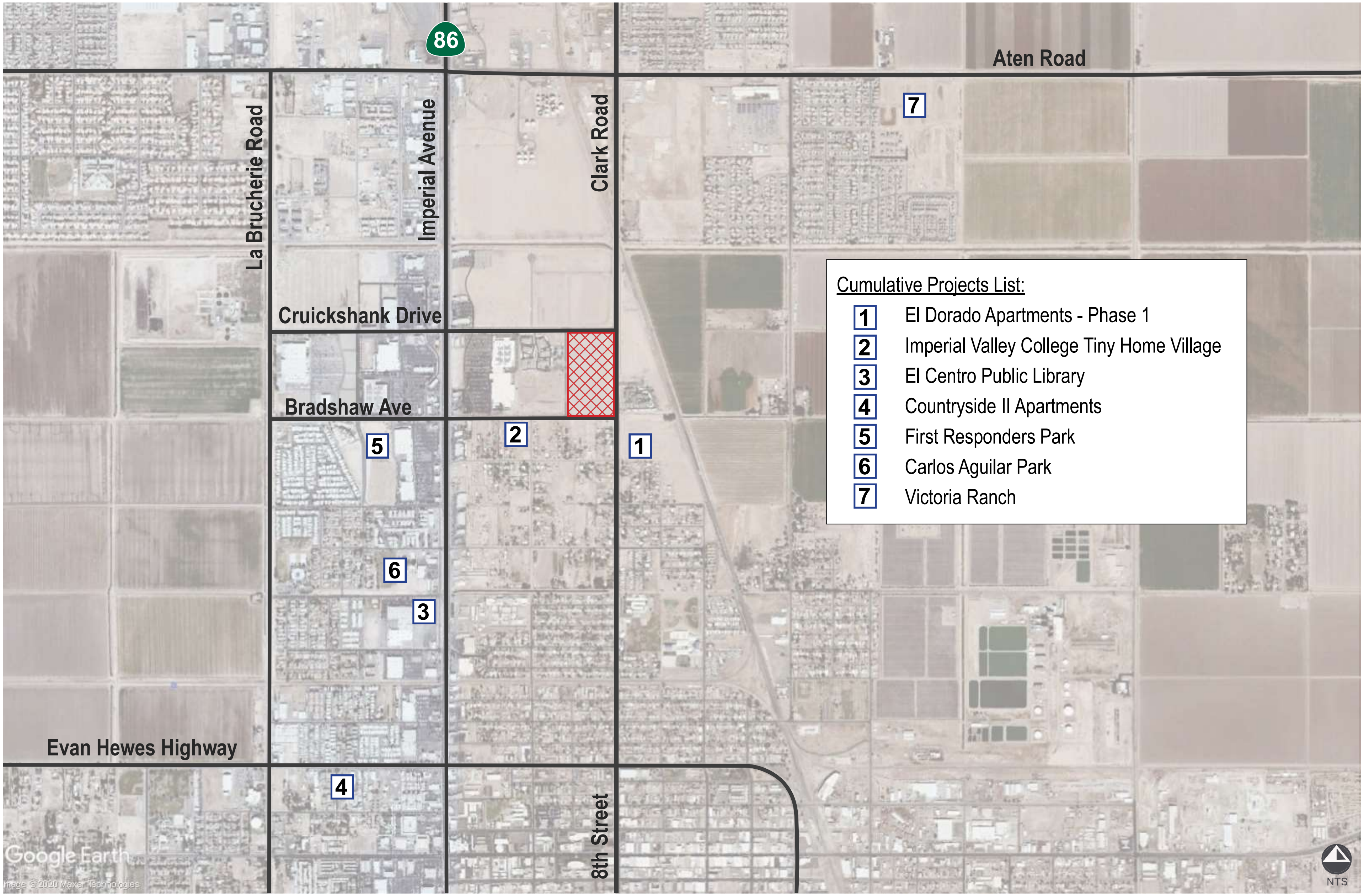
Exhibit 12 shows the location of each cumulative project. **Table 11** provides a trip generation summary of the cumulative project traffic. **Appendix F** contains traffic information from these cumulative projects.

TABLE 11 – CUMULATIVE PROJECTS TRIP GENERATION SUMMARY

Cumulative Project	Intensity	Daily Trips	AM Peak Hour Trips		PM Peak Hour Trips	
			Total	In : Out	Total	In : Out
El Dorado Apartments (Phase 1)	24 DU	140	12	3 : 9	17	10 : 7
Imperial Valley College Tiny Home Village	27 DU	135	7	2 : 5	12	7 : 5
El Centro Public Library	19.3 KSF	1,379	18	13 : 5	157	75 : 82
Countryside II Apartments	56 DU	382	27	6 : 21	35	22 : 13
First Responders Park	6 AC	92	0	0 : 0	23	13 : 10
Carlos Aguilar Park	3 AC	46	0	0 : 0	12	6 : 6
Victoria Ranch	153 DU	1,538	113	28 : 85	153	96 : 57
Total Cumulative Project Traffic		**3,712**	**177**	**52 : 125**	**409**	**229 : 180**

Notes:
DU = Dwelling Unit
KSF = Thousand Square Feet
AC = Acres

Exhibit 13 shows the cumulative project only daily and AM/PM peak hour traffic volumes assigned to the study intersections and roadway segments.



Legend

= Project Site

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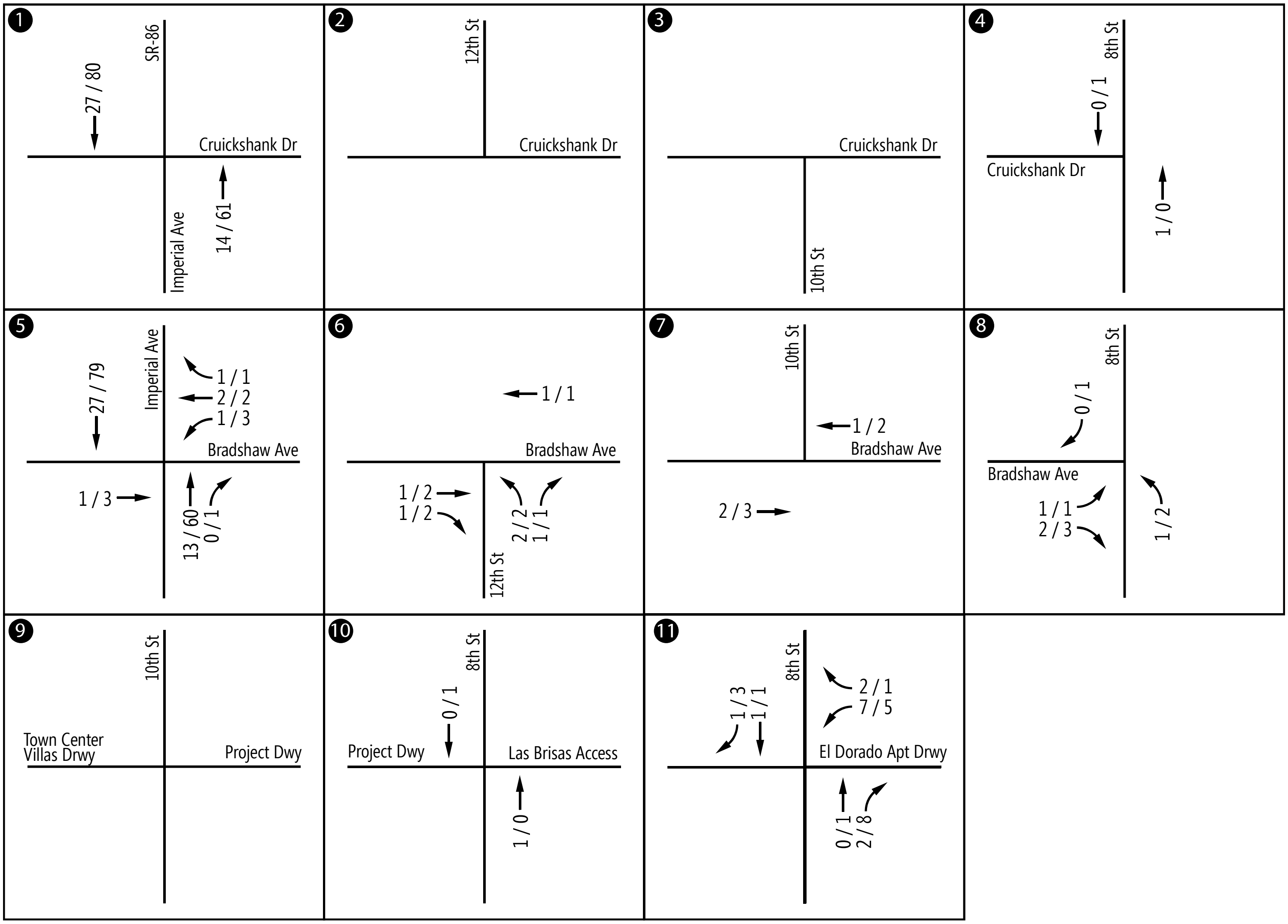
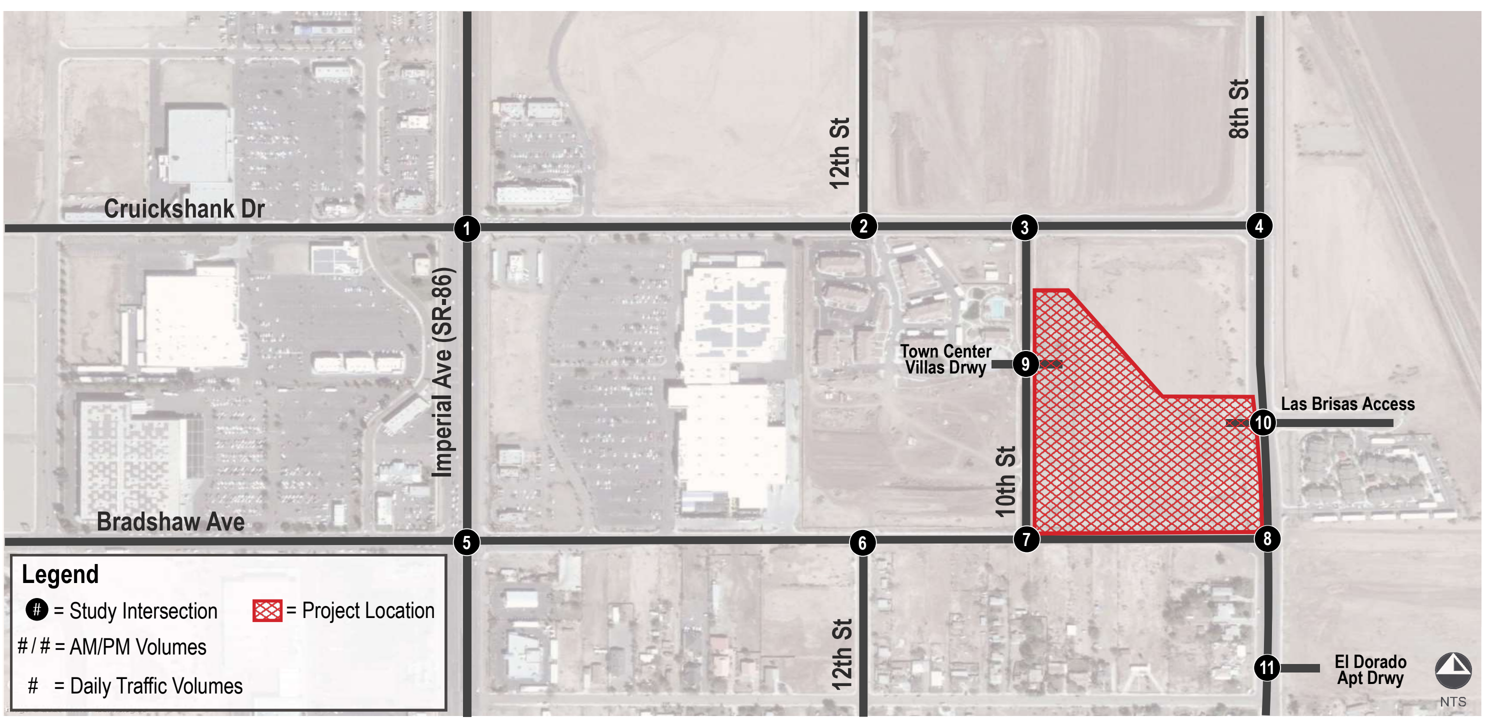
Cumulative Project Locations

Exhibit 12





Cumulative Project Only
Daily and AM/PM Peak Hour Traffic Volumes

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Exhibit 13

5.7.2 Opening Year 2022 Without Project Intersection Evaluation

The Opening Year 2022 Without Project scenario accounts for the addition of cumulative traffic onto the existing traffic. **Exhibit 14** shows the Opening Year 2022 Without Project AM/PM peak hour volumes within the study area.

Table 12 summarizes Opening Year 2022 Without Project AM/PM peak hour level of service for all study intersections. For unsignalized intersections, the minor street approach delay and level of service is reported. Detailed HCM analysis worksheets are contained in **Appendix G**.

TABLE 12 – OPENING YEAR 2022 WITHOUT PROJECT AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection		Traffic Control	Opening Year 2022 Without Project Conditions					
			AM			PM		
			Delay[1]	-	LOS	Delay[1]	-	LOS
1 -	Imperial Avenue (SR-86) / Cruickshank Drive	Signal	**45.2**	**-**	**D**	**55.1**	**-**	**E**
2 -	Cruickshank Drive / 12th Street	TWSC	8.9	-	A	8.9	-	A
3 -	Cruickshank Drive / 10th Street	TWSC	9.6	-	A	11.4	-	B
4 -	Cruickshank Drive / 8th Street	Signal	12.3	-	B	17.5	-	B
5 -	Imperial Avenue (SR-86) / Bradshaw Avenue	Signal	28.3	-	C	**42.4**	**-**	**D**
6 -	Bradshaw Avenue / 12th Street	TWSC	9.6	-	A	10.9	-	B
7 -	Bradshaw Avenue / 10th Street	TWSC	9.1	-	A	9.5	-	A
8 -	Bradshaw Avenue / 8th Street	OWSC	11.6	-	B	12.6	-	B
9 -	10th Street / Villa Way - Project Driveway	TWSC	7.3	-	A	7.4	-	A
10 -	8th Street / Project Driveway	OWSC	11.2	-	B	11.8	-	B
11 -	8th Street / El Dorado Family Apt. Driveway	OWSC	14.0	-	B	16.9	-	C

Note: Deficient intersection operation indicated in bold.

[1] Average seconds of delay per vehicle.

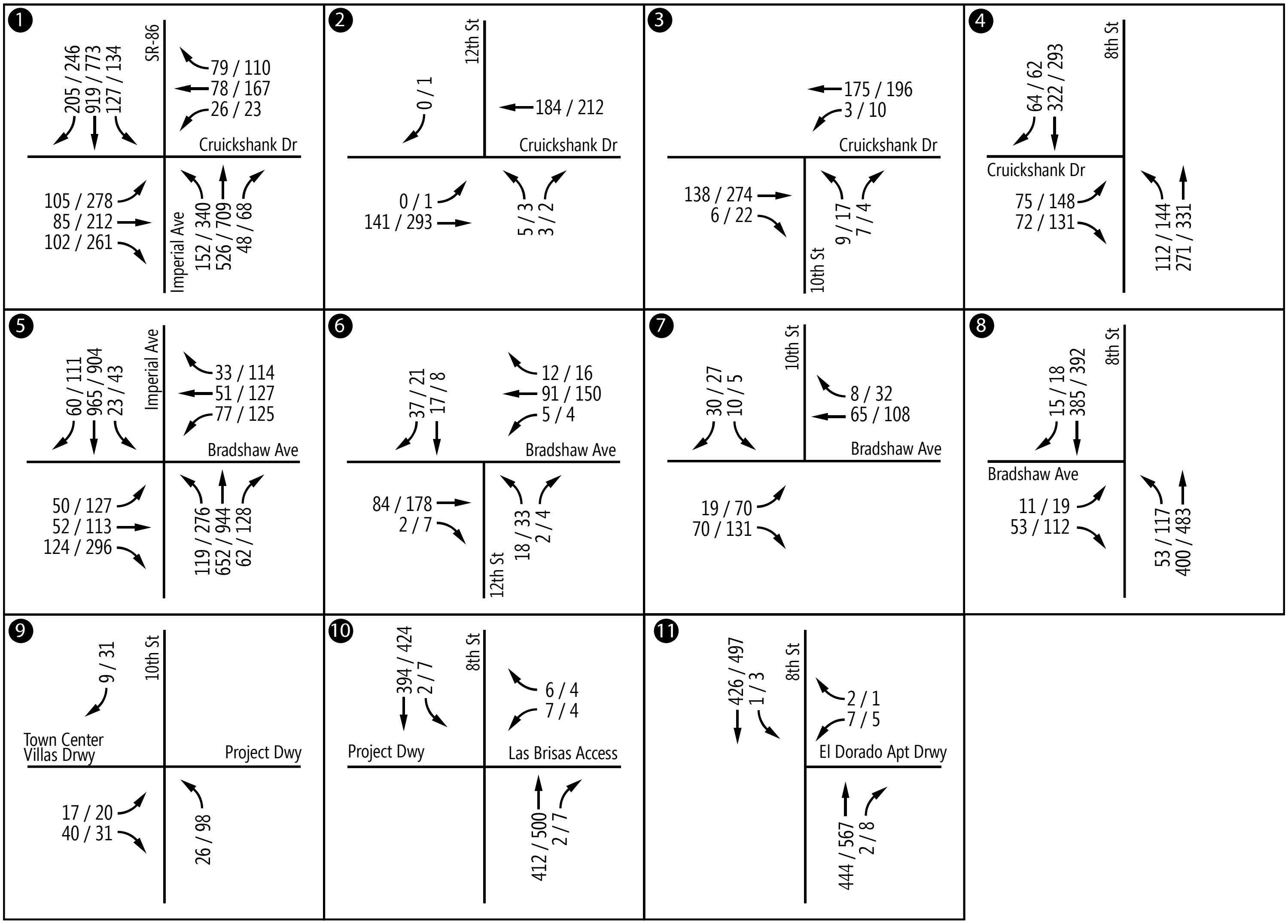
LOS = level of service.

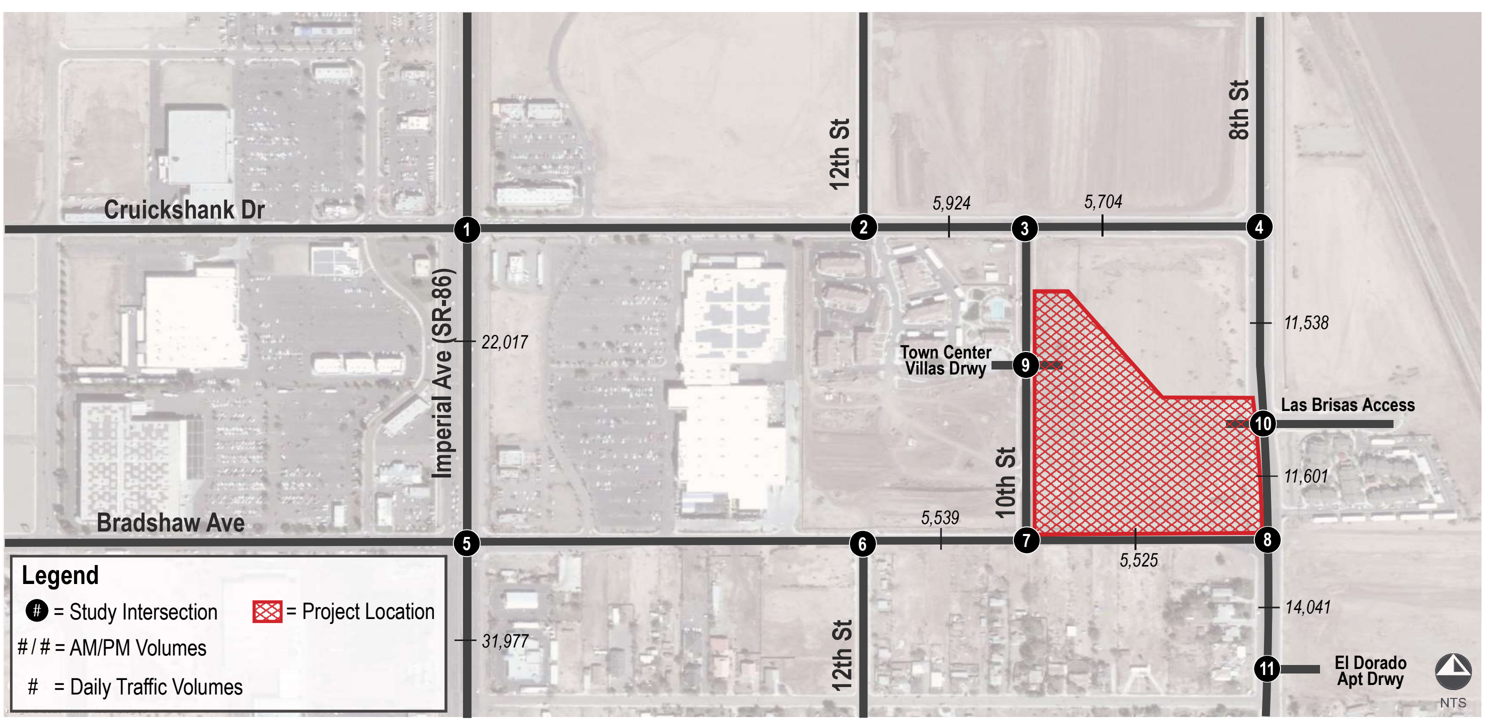
TWSC = Two-Way Stop Control

OWSC = One-Way Stop Control

As shown, all study intersections are forecast to operate LOS C or better during the AM/PM peak hours except for the following intersections:

- Imperial Avenue (SR-86) / Cruickshank Drive LOS D in AM Peak Hour, LOS E in PM Peak Hour
- Imperial Avenue (SR-86) / Bradshaw Avenue LOS D in PM Peak Hour only





Opening Year 2022 Without Project
Daily and AM/PM Peak Hour Traffic Volumes

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Exhibit 14

5.7.3 Opening Year 2022 Without Project Roadway Segment Evaluation

Table 13 summarizes Opening Year 2022 Without Project conditions average daily traffic level of service for all study roadway segments based on the ADT threshold table . As shown, all study roadway segments are currently operating at LOS C or better under Opening Year 2022 Without Project conditions.

TABLE 13 – OPENING YEAR 2022 WITHOUT PROJECT CONDITIONS ROADWAY SEGMENT LOS

Roadway	Segment	Classification	LOS E Capacity	Opening Year 2022 Without Project		
				ADT	V/C	LOS
Cruickshank Drive	12th St. to 10th St.	4-Lane Undivided Arterial	27,000	5,924	0.22	A
	10th St. to 8th St.	4-Lane Undivided Arterial	27,000	5,704	0.21	A
Bradshaw Avenue	12th St. to 10th St.	2-Lane Collector	12,000	5,539	0.46	A
	10th St. to 8th St.	2-Lane Collector	12,000	5,525	0.46	A
8th Street	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	11,538	0.32	A
	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	11,601	0.32	A
	South of Bradshaw Ave.	4-Lane Undivided Arterial	27,000	14,041	0.52	A
Imperial Avenue (SR-86)	Cruickshank Dr. to Bradshaw Ave.	4-Lane Divided Arterial	36,000	22,017	0.61	B
	South of Bradshaw Ave.	6-Lane Divided Arterial	54,000	31,977	0.59	A

Note: Deficient roadway segment operations shown in **bold**
ADT= Average Daily Traffic
LOS= Level of Service
V/C= Volume to Capacity Ratio

5.8 OPENING YEAR 2022 PLUS PROJECT ANALYSIS

Opening Year 2022 Plus Project traffic volumes are derived by adding trips forecast to be generated by the proposed project to Opening Year 2022 Without Project traffic volumes. **Exhibit 15** shows the Opening Year 2022 Plus Project daily and AM/PM peak hour volumes within the study area.

5.8.1 Opening Year 2022 Plus Project Intersection Evaluation

Table 14 compares Opening Year 2022 Without Project intersection operations to Opening Year 2022 Plus Project intersection operations for all study intersections. For unsignalized intersections, the minor approach delay and level of service is reported. At the 8th Street/Project Driveway intersection, a dedicated right-turn lane is assumed in the southbound approach of the Opening Year 2022 Plus Project conditions analysis. However, this intersection operates acceptably without the southbound right-turn lane. Detailed HCM analysis worksheets are contained in **Appendix H**.

According to the City's improvements standards, an improvement would be warranted at an intersection if the addition of project related traffic to an intersection operating acceptably without the project, causes the facility to degrade to a LOS D, E or F with the addition of project related traffic. If a study intersection is operating at LOS D, E or F without the project and the addition of project related traffic increases delay by 2 seconds or more, than improvements are required to offset the increase in delay.

TABLE 14 – OPENING YEAR 2022 PLUS PROJECT AM/PM PEAK HOUR INTERSECTION LOS

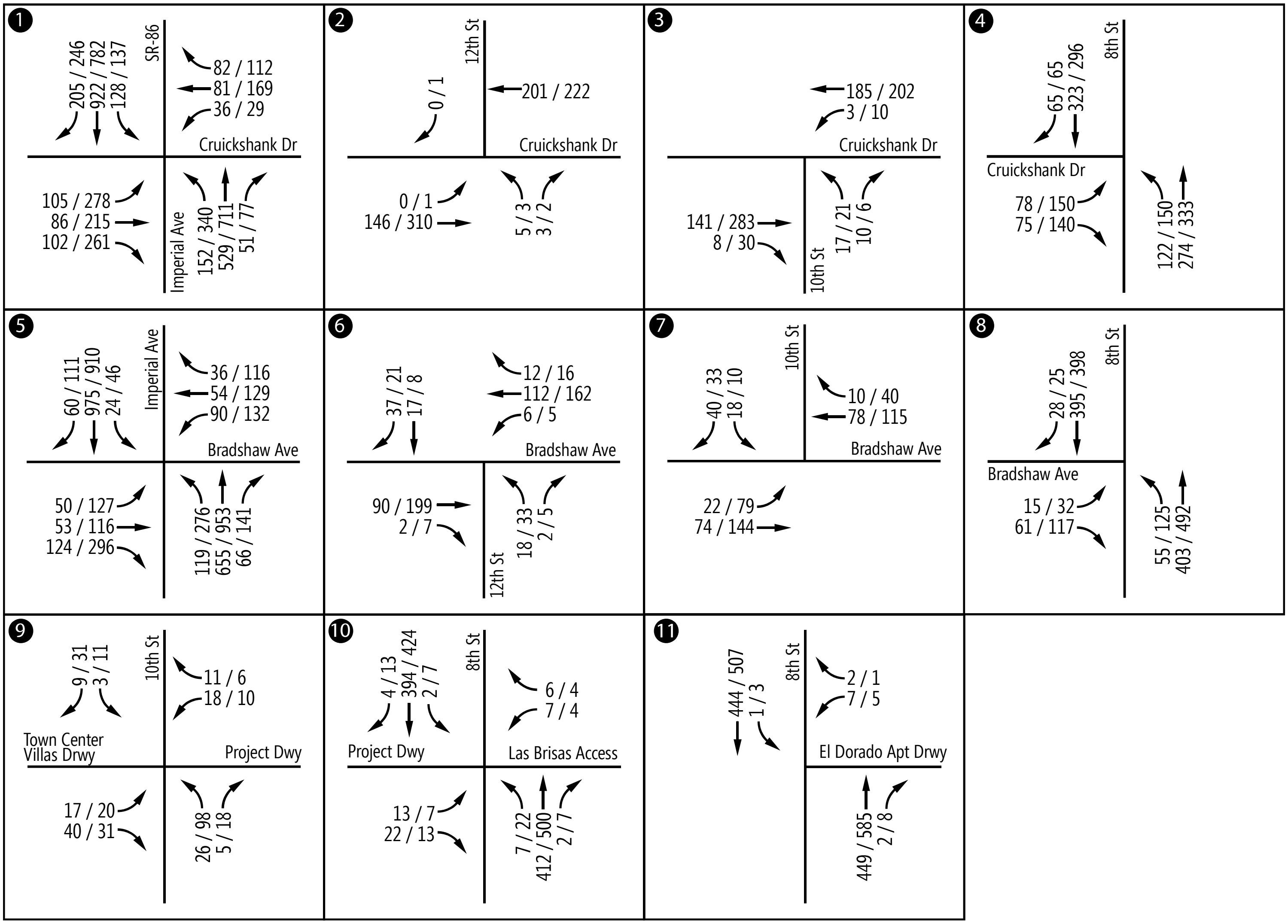
Study Intersection	Traffic Control	Opening Year 2022 Conditions		Opening Year 2022 Plus Project Conditions		Change in Delay (sec.)		Improvements Warranted?	
		AM	PM	AM	PM				
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM	AM	PM
1 - SR-86 / Cruickshank Drive	Signal	**45.2 - D**	**55.1 - E**	**46.3 - D**	**55.6 - E**	1.1	0.5	No	No
2 - Cruickshank Drive / 12th Street	TWSC	8.9 - A	8.9 - A	8.9 - A	9.0 - A	0.0	0.1	No	No
3 - Cruickshank Drive / 10th Street	TWSC	9.6 - A	11.4 - B	9.8 - A	11.6 - B	0.2	0.2	No	No
4 - Cruickshank Drive / 8th Street	Signal	12.3 - B	17.5 - B	13.1 - B	19.0 - B	0.8	1.5	No	No
5 - SR-86 / Bradshaw Road	Signal	28.3 - C	**42.4 - D**	29.3 - C	**43.2 - D**	1.0	0.8	No	No
6 - Bradshaw Road / 12th Street	TWSC	9.6 - A	10.9 - B	9.8 - A	11.2 - B	0.2	0.3	No	No
7 - Bradshaw Road / 10th Street	TWSC	9.1 - A	9.5 - A	9.4 - A	10.0 - B	0.3	0.5	No	No
8 - Bradshaw Road / 8th Street	OWSC	11.6 - B	12.6 - B	12.0 - B	13.2 - B	0.4	0.6	No	No
9 - 10th Street / Villa Way - Project Driveway	TWSC	7.3 - A	7.4 - A	9.0 - A	10.1 - B	1.7	2.7	No	No
10 - 8th Street / Project Driveway	OWSC	11.2 - B	11.8 - B	13.3 - B	15.0 - C	2.1	3.2	No	No
11 - 8th Street / El Dorado Family Apt. Driveway	OWSC	14.0 - B	16.9 - C	14.2 - B	17.4 - C	0.2	0.5	No	No

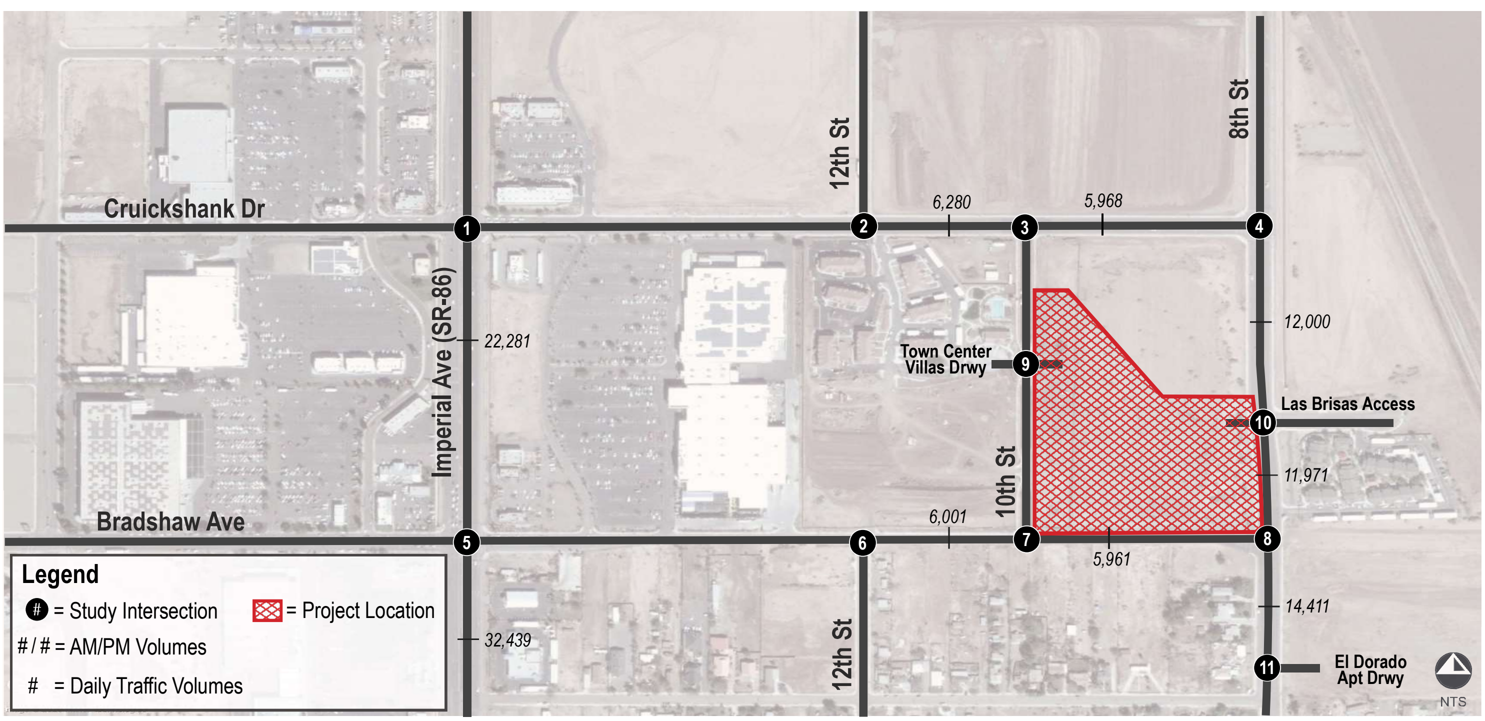
Note: Deficient intersection operation indicated in **bold**.
[1] Seconds of delay per vehicle.
LOS = level of service.
TWSC = Two-Way Stop Control
OWSC = One-Way Stop Control

As shown, all study intersections are forecast to operate at an acceptable level of service (LOS C or better) during the AM/PM peak hours except for the following intersections:

- Imperial Avenue (SR-86) / Cruickshank Drive — LOS D in AM Peak Hour, LOS E in PM Peak Hour
- Imperial Avenue (SR-86) / Bradshaw Avenue — LOS D in PM Peak Hour only

As shown in **Table 14**, project related traffic does not increase the change in delay by more than 2 seconds. Therefore, the project is not required to provide improvements to any of the study intersections under Opening Year 2022 Plus Project conditions.





Opening Year 2022 Plus Project
Daily and AM/PM Peak Hour Traffic Volumes

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Exhibit 15

5.8.2 AM/PM Opening Year 2022 Plus Project Roadway Segment Evaluation

Table 15 provides a comparison of Opening Year 2022 Without Project and Opening Year 2022 Plus Project conditions average daily traffic LOS for all study roadway segments based on the V/C ratio.

TABLE 15 – OPENING YEAR 2022 & OPENING YEAR 2022 PLUS PROJECT ROADWAY SEGMENT LOS COMPARISON

Roadway	Segment	Classification (No. Lanes)	LOS E Capacity	Opening Year 2022 Without Project			Opening Year 2022 Plus Project			Δ V/C	Improv. Warranted?
				ADT	V/C	LOS	ADT	V/C	LOS		
Cruickshank Drive	12th St. to 10th St.	4-Lane Undivided Arterial	27,000	5,924	0.22	A	6,280	0.23	A	0.013	No
	10th St. to 8th St.	4-Lane Undivided Arterial	27,000	5,704	0.21	A	5,968	0.22	A	0.010	No
Bradshaw Avenue	12th St. to 10th St.	2-Lane Collector	12,000	5,539	0.46	A	6,001	0.50	B	0.039	No
	10th St. to 8th St.	2-Lane Collector	12,000	5,525	0.46	A	5,961	0.50	A	0.036	No
8th Street	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	11,538	0.32	A	12,000	0.33	A	0.013	No
	South of Bradshaw Ave.	4-Lane Undivided Arterial	27,000	11,601	0.32	A	11,971	0.33	A	0.010	No
Imperial Avenue (SR-86)	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	14,041	0.52	A	14,411	0.53	A	0.014	No
	Cruickshank Dr. to Project Driveway	6-Lane Divided Arterial	54,000	22,017	0.61	B	22,281	0.62	B	0.007	No
	South of Bradshaw Ave.	6-Lane Divided Arterial	54,000	31,977	0.59	A	32,439	0.60	B	0.009	No

Note: Deficient roadway segment operations shown in **bold**.
LOS= Level of Service
V/C= Volume to Capacity Ratio
Δ= Difference

According to the City's improvements standards, an improvement would be warranted on a roadway segment if the addition of project related traffic to the segment operating acceptably without the project, causes the facility to degrade to a LOS D, E or F with the addition of project related traffic. If a study segment is operating at LOS D, E or F without the project and the addition of project related traffic increases the volume-to-capacity ratio by 0.02 or more, than improvements are required.

As shown in **Table 15**, project related traffic does not increase the change in V/C ratio by more than 0.02. Therefore, the project is not required to provide improvements to any of the study roadway segments under Opening Year 2022 Plus Project conditions.

5.9 HORIZON YEAR 2040 WITHOUT PROJECT ANALYSIS

This scenario evaluates conditions for the Horizon Year 2040 Without Project conditions. The City of El Centro is currently updating their 2040 General Plan. As part of this update, the City modeled two land use alternatives. Based on consultation with City staff, Alternative 1 is the preferred land use alternative and were provided by City staff for use in developing the Horizon Year 2040 Without Project traffic volumes. To determine Horizon Year 2040 AM/PM peak hour traffic volumes at study intersections, the growth in daily traffic from base year 2018 to model year 2040 was calculated and converted into a growth per year. This growth per year which varies from segment to segment was then calculated from the project's opening year in 2022 to the Horizon Year 2040. The calculated growth from Year 2022 to 2040 was then applied to the Opening Year 2022 AM/PM Without Project volumes to derive the Horizon Year 2040 Without Project AM/PM peak hour traffic volumes. The assumed growth and Horizon Year 2040 Without Project daily and peak hour traffic volumes were then reviewed for reasonableness. **Appendix I** provides the worksheets used to determine the Horizon Year 2040 traffic volumes.

Exhibit 16 shows the Horizon Year 2040 Without Project daily and AM/PM peak hour volumes within the study area. Traffic associated with Phase 2 and 3 of the El Dorado Apartment project has been included in the Horizon Year 2040 conditions.

5.9.1 Horizon Year 2040 Without Project Intersection Evaluation

Table 16 summarizes Horizon Year 2040 Without Project AM/PM peak hour level of service for all study intersections. For unsignalized intersections, the minor street approach delay and level of service is reported. Detailed HCM analysis worksheets are contained in **Appendix J**.

TABLE 16 – HORIZON YEAR 2040 WITHOUT PROJECT AM/PM PEAK HOUR INTERSECTION LOS

Study Intersection	Traffic Control	Horizon Year 2040 Without Project Conditions	
		AM	PM
		Delay[1] - LOS	Delay[1] - LOS
1 - Imperial Avenue (SR-86) / Cruickshank Drive	Signal	**48.5 - D**	**71.7 - E**
2 - Cruickshank Drive / 12th Street	TWSC	9.7 - A	9.9 - A
3 - Cruickshank Drive / 10th Street	TWSC	11.9 - B	20.8 - C
4 - Cruickshank Drive / 8th Street	Signal	18.5 - B	22.4 - C
5 - Imperial Avenue (SR-86) / Bradshaw Avenue	Signal	**37.4 - D**	**42.5 - D**
6 - Bradshaw Avenue / 12th Street	TWSC	9.7 - A	11.1 - B
7 - Bradshaw Avenue / 10th Street	TWSC	9.2 - A	9.6 - A
8 - Bradshaw Avenue / 8th Street	OWSC	13.0 - B	14.5 - B
9 - 10th Street / Villa Way - Project Driveway	TWSC	7.3 - A	7.4 - A
10 - 8th Street / Project Driveway	OWSC	12.6 - B	13.5 - B
11 - 8th Street / El Dorado Family Apt. Driveway	OWSC	19.4 - C	**25.5 - D**

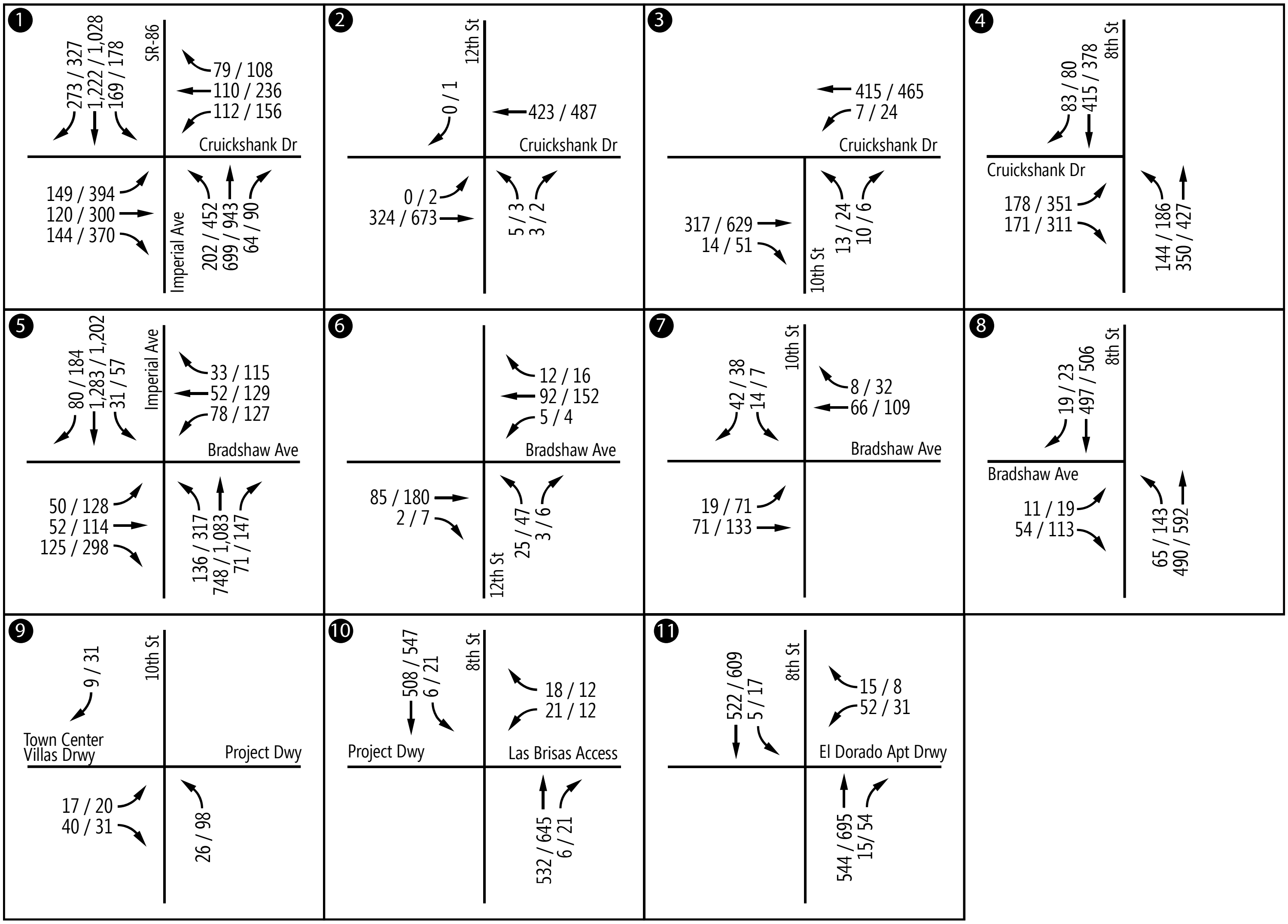
Note: Deficient intersection operation indicated in **bold**.

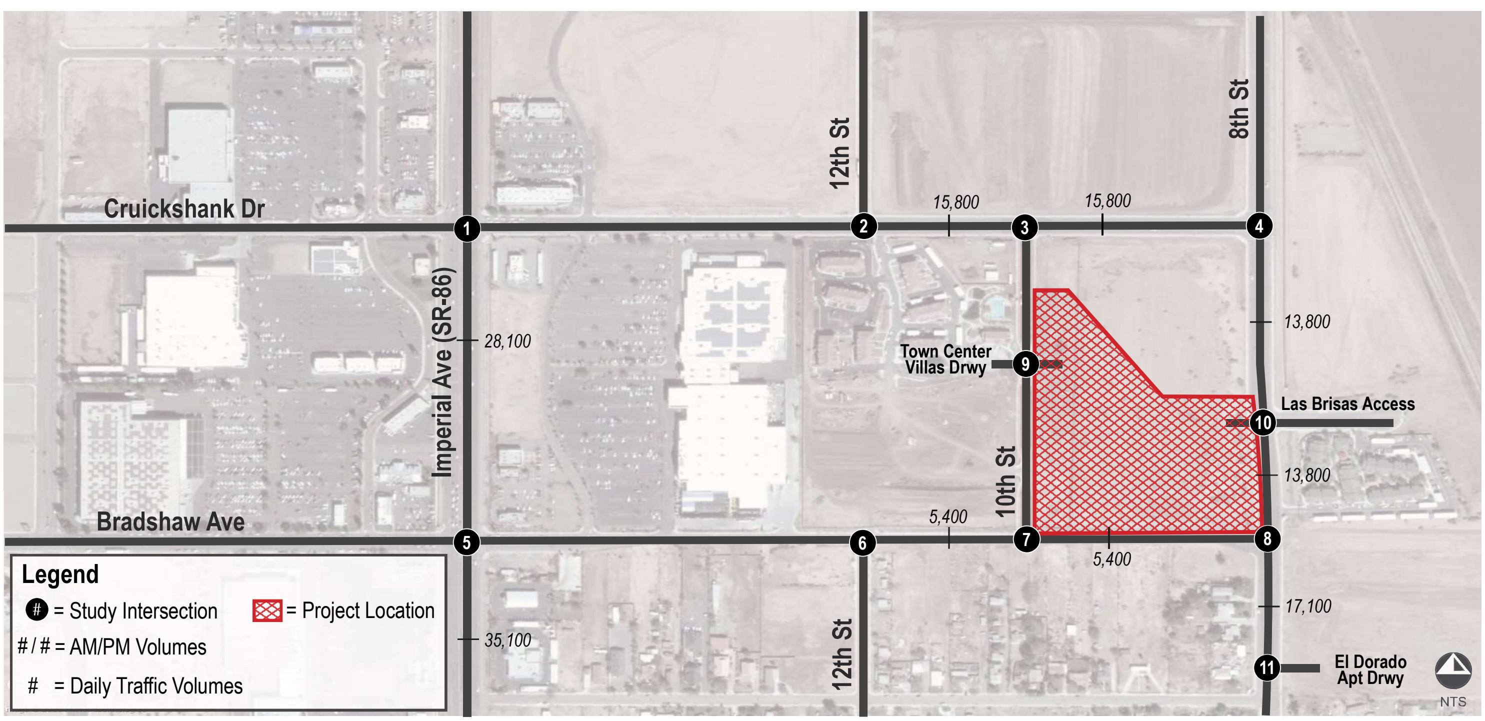
[1] Average seconds of delay per vehicle.

LOS = level of service.

TWSC = Two-Way Stop Control

OWSC = One-Way Stop Control





Horizon Year 2040 Without Project
Daily and AM/PM Peak Hour Traffic Volumes

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Exhibit 16

As shown, most of the study intersections are forecast to operate at an LOS C or better during the AM/PM peak hours except for the following intersections:

- AM/PM Imperial Avenue (SR-86) / Cruickshank Drive — LOS D in AM & LOS E in PM Peak Hour
- Imperial Avenue (SR-86) / Bradshaw Avenue — LOS D in AM/PM Peak Hour
- 8th Street / El Dorado Apt Driveway. — LOS D in PM Peak Hour only

5.9.2 Horizon Year 2040 Without Project Roadway Segment Evaluation

Table 17 summarizes Horizon Year 2040 Without Project conditions average daily traffic LOS for all study roadway segments based on the V/C ratio.

TABLE 17 – HORIZON YEAR 2040 WITHOUT PROJECT CONDITIONS ROADWAY SEGMENT LOS

Roadway	Segment	Classification	LOS E Capacity	Horizon Year 2040 Without Project		
				ADT	V/C	LOS
Cruickshank Drive	12th St. to 10th St.	4-Lane Undivided Arterial	27,000	15,800	0.59	A
	10th St. to 8th St.	4-Lane Undivided Arterial	27,000	15,800	0.59	A
Bradshaw Avenue	12th St. to 10th St.	2-Lane Collector	12,000	5,400	0.45	A
	10th St. to 8th St.	2-Lane Collector	12,000	5,400	0.45	A
8th Street	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	13,800	0.38	A
	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	13,800	0.38	A
	South of Bradshaw Ave.	4-Lane Undivided Arterial	27,000	17,100	0.63	B
Imperial Avenue (SR-86)	Cruickshank Dr. to Bradshaw Ave.	4-Lane Divided Arterial	36,000	28,100	0.78	C
	South of Bradshaw Ave.	6-Lane Divided Arterial	54,000	35,100	0.65	B

Note: Deficient roadway segment operations shown in **bold**.

ADT= Average Daily Traffic

LOS= Level of Service

V/C= Volume to Capacity Ratio

As shown in **Table 17**, all study roadway segments are currently operating at LOS C or better under Horizon Year 2040 Without Project conditions.

5.10 HORIZON YEAR 2040 PLUS PROJECT ANALYSIS

Horizon Year 2040 Plus Project traffic volumes are derived by adding trips forecast to be generated by the proposed project to Horizon Year 2040 Without Project traffic volumes.

Exhibit 17 shows the Horizon Year 2040 Plus Project daily and AM/PM peak hour volumes within the study area.

5.10.1.1 Horizon Year 2040 Plus Project Intersection Evaluation

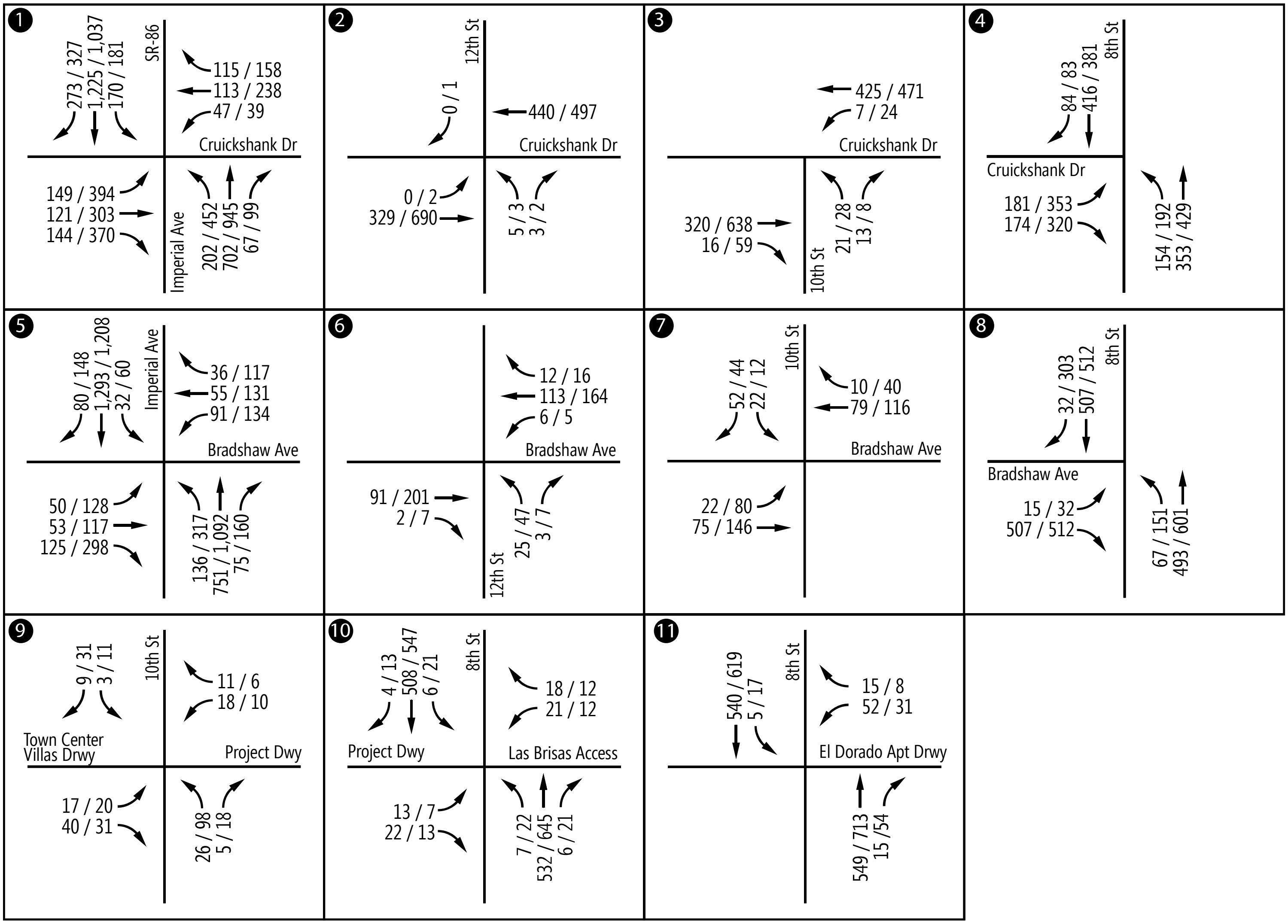
Table 18 compares Horizon Year 2040 Without Project intersection operations to Horizon Year 2040 Plus Project intersection operations for all study intersections. For unsignalized intersections, the minor approach delay and LOS is reported. At the 8th Street/Project Driveway intersection, a dedicated right-turn lane is assumed in the southbound approach of the Horizon Year 240 Plus Project conditions analysis. However, this intersection operates acceptably without the southbound right-turn lane. Detailed HCM analysis worksheets are contained in **Appendix K**.

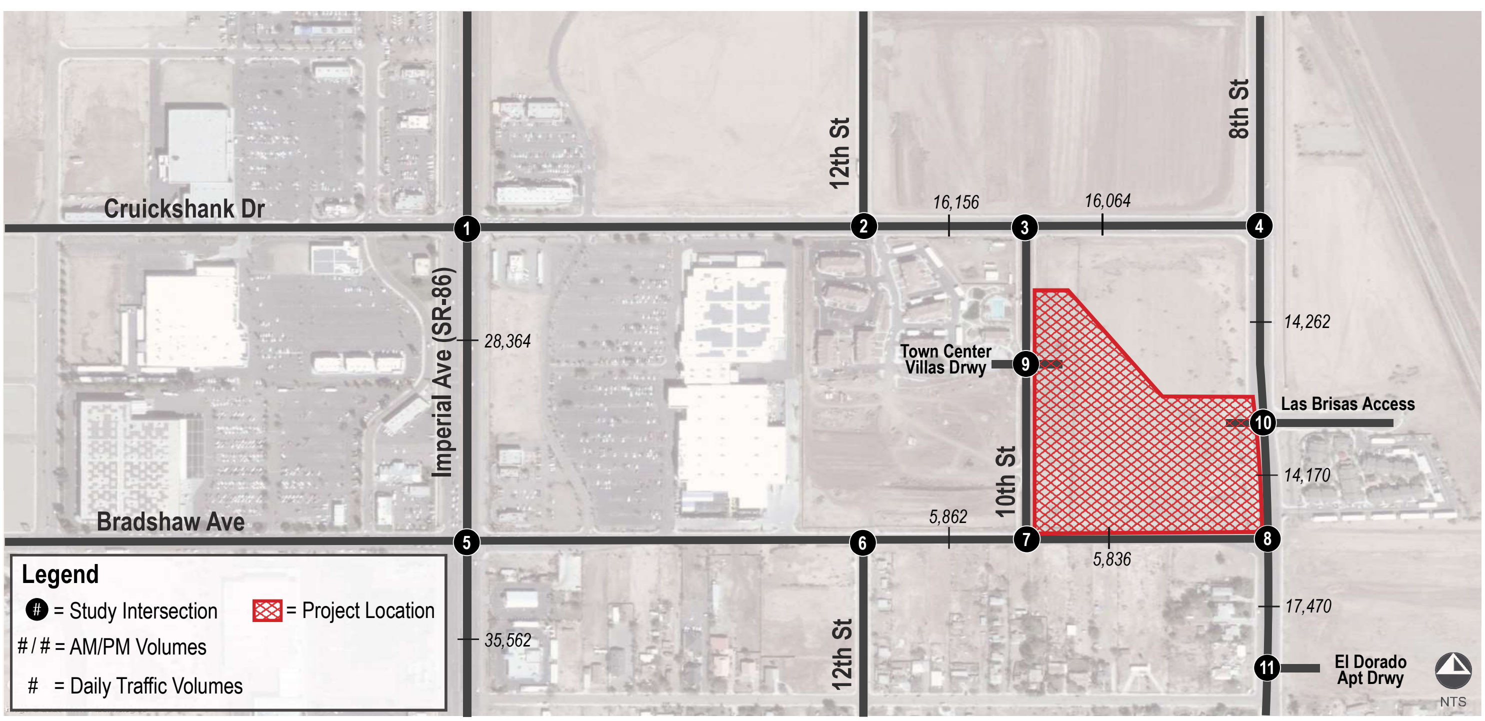
According to the City's improvements standards, an improvement would be required at an intersection if the addition of project related traffic to an intersection operating acceptably without the project, causes the facility to degrade to a LOS D, E or F with the addition of project related traffic. If a study intersection is operating at LOS D, E or F without the project and the addition of project related traffic increases delay by 2 seconds or more, than improvements are required to offset the increase in delay.

TABLE 18 – HORIZON YEAR 2040 WITHOUT PROJECT AND HORIZON YEAR 2040 PLUS PROJECT AM/PM PEAK HOUR INTERSECTION LOS COMPARISON

Study Intersection	Traffic Control	Horizon Year 2040 Conditions		Horizon Year 2040 Plus Project Conditions		Change in Delay (sec.)		Improvements Warranted?	
		AM	PM	AM	PM				
		Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	Delay[1] - LOS	AM	PM	AM	PM
1 - SR-86 / Cruickshank Drive	Signal	**48.5 - D**	**71.7 - E**	**50.2 - D**	**73.3 - E**	1.7	1.6	No	No
2 - Cruickshank Drive / 12th Street	TWSC	9.7 - A	9.9 - A	9.7 - A	10.0 - A	0.0	0.1	No	No
3 - Cruickshank Drive / 10th Street	TWSC	11.9 - B	20.8 - C	12.4 - B	21.4 - C	0.5	0.6	No	No
4 - Cruickshank Drive / 8th Street	Signal	18.5 - B	22.4 - C	19.4 - B	23.4 - C	0.9	1.0	No	No
5 - SR-86 / Bradshaw Road	Signal	**37.4 - D**	**42.5 - D**	**39.1 - D**	**43.8 - D**	1.7	1.3	No	No
6 - Bradshaw Road / 12th Street	TWSC	9.7 - A	11.1 - B	9.9 - A	11.4 - B	0.2	0.3	No	No
7 - Bradshaw Road / 10th Street	TWSC	9.2 - A	9.6 - A	9.4 - A	10.1 - B	0.2	0.5	No	No
8 - Bradshaw Road / 8th Street	OWSC	13.0 - B	14.5 - B	13.3 - B	15.3 - C	0.3	0.8	No	No
9 - 10th Street / Villa Way - Project Driveway	TWSC	7.3 - A	7.4 - A	9.0 - A	10.1 - B	1.7	2.7	No	No
10 - 8th Street / Project Driveway	OWSC	12.6 - B	13.5 - B	16.9 - C	20.6 - C	4.3	7.1	No	No
11 - 8th Street / El Dorado Family Apt. Driveway	OWSC	19.4 - C	**25.5 - D**	19.8 - C	**26.4 - D**	0.4	0.9	No	No

Note: Deficient intersection operation indicated in **bold**.
[1] Seconds of delay per vehicle.
LOS = level of service.
TWSC = Two-Way Stop Control
OWSC = One-Way Stop Control





Horizon Year 2040 Plus Project
Daily and AM/PM Peak Hour Traffic Volumes

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Exhibit 17

As shown, most study intersections are forecast to operate at LOS C or better during the AM/PM peak hours except for the following intersections:

- Imperial Avenue (SR-86) / Cruickshank Drive — LOS D in the AM and LOS E in the PM Peak Hour
- Imperial Avenue (SR-86) / Bradshaw Avenue — LOS D in the AM/PM Peak Hour
- 8th St / El Dorado Apt. Driveway — LOD D in the PM Peak Hour only

As shown in **Table 18**, project related traffic does not increase the change in delay by more than 2 seconds at intersections operating at LOS D or E. Therefore, the project is not required to provide improvements to any of the study intersections under Horizon Year 2040 Plus Project conditions.

5.10.1.2 Horizon Year 2040 Plus Project Roadway Segment Evaluation

Table 19 provides a comparison of Horizon Year 2040 Without Project and Horizon Year 2040 Plus Project conditions average daily traffic level of service for all study roadway segments based on the V/C ratio.

TABLE 19 – HORIZON YEAR 2040 & HORIZON YEAR 2040 PLUS PROJECT ROADWAY SEGMENT LOS COMPARISON

Roadway	Segment	Classification (No. Lanes)	LOS E Capacity	Horizon Year 2040 Without Project			Horizon Year 2040 Plus Project			Δ V/C	Improv. Warranted?
				ADT	V/C	LOS	ADT	V/C	LOS		
Cruickshank Drive	12th St. to 10th St.	4-Lane Undivided Arterial	27,000	15,800	0.59	A	16,156	0.60	B	0.013	No
	10th St. to 8th St.	4-Lane Undivided Arterial	27,000	15,800	0.59	A	16,064	0.59	B	0.010	No
Bradshaw Avenue	12th St. to 10th St.	2-Lane Collector	12,000	5,400	0.45	A	5,862	0.49	A	0.039	No
	10th St. to 8th St.	2-Lane Collector	12,000	5,400	0.45	A	5,836	0.49	A	0.036	No
8th Street	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	13,800	0.38	A	14,262	0.40	A	0.013	No
	South of Bradshaw Ave.	4-Lane Undivided Arterial	27,000	13,800	0.38	A	14,170	0.39	A	0.010	No
Imperial Avenue (SR-86)	Cruickshank Dr. to Project Driveway	4-Lane Divided Arterial	36,000	17,100	0.63	B	17,470	0.65	B	0.014	No
	Cruickshank Dr. to Project Driveway	6-Lane Divided Arterial	54,000	28,100	0.78	C	28,364	0.79	C	0.007	No
	South of Bradshaw Ave.	6-Lane Divided Arterial	54,000	35,100	0.65	B	35,562	0.66	B	0.009	No

Note: Deficient roadway segment operations shown in **bold**.
LOS= Level of Service
V/C= Volume to Capacity Ratio
Δ= Difference

According to the City's thresholds of improvements standards, an improvement would be warranted on a roadway segment if the addition of project related traffic to the segment operating acceptably without the project, causes the facility to degrade to a LOS D, E or F with the addition of project related traffic. If a study segment is operating at LOS D, E or F without the project and the addition of project related traffic increases the volume-to-capacity ratio by 0.02 or more, than improvements are required.

As shown in **Table 19**, project related traffic does not increase the change in V/C ratio by more than 0.02 at deficient roadway segments. Therefore, the project is not required to provide improvements to any of the study roadway segments under Horizon Year 2040 Plus Project conditions.

5.11 TRAFFIC SIGNAL WARRANT ANALYSIS

The 2014 *California Manual on Uniform Traffic Control Devices* (*CA MUTCD*) contains minimum guidelines regarding traffic volumes, collisions, speeds, visibility and other criteria in order to satisfy the requirements for the recommendation of a traffic signal.

A Peak Hour Warrant (CA MUTCD Warrant #3) was evaluated at the intersection of 8th Street / El Dorado Family Apartment Driveway since this location is currently unsignalized and operating deficiently (LOS D) in the PM peak hour under Horizon Year 2040 conditions. The intersection analysis results show the proposed project driveways on 10th Street and 8th Street operate acceptably (LOS C or better) under Opening Year 2022 and Horizon Year 2040 conditions. Therefore, signal warrants were not evaluated at the proposed project driveways.

The Peak Hour Warrant (Warrant #3) is intended for use at a location where traffic conditions are such that for a minimum of one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. According to the CA MUTCD Section 4C.04, the need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

A.) If all three of the following conditions exist for the same one-hour of an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for one-lane approach or 5-vehicle hours for two-lane approach; and

2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour (VPH) for one moving lane of traffic or 150 VPH for two moving lanes; and

3. The total entering volume serviced during the hour equals or exceeds 650 VPH for intersections with three approaches or 800 VPH for intersections with four or more approaches.

B.) The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

The Peak Hour Signal Warrant analysis shows a traffic signal is not warranted at the intersection of 8th Street / El Dorado Family Apartment Driveway under Horizon Year 2040 Plus Project conditions. Detailed signal warrant worksheets can be found in **Appendix L** of this report.

5.12 QUEUING ANALYSIS

The El Dorado Family Apartment project is located on the eastside of 8th Street between Bradshaw Avenue and El Dorado Avenue. A full access driveway is planned for Phase 1 of the El Dorado Family Apartment project approximately 450 feet south of Bradshaw Avenue. The City requested Michael Baker evaluate the potential queuing issues along 8th Street from traffic making southbound left-turns into the El Dorado Family Apartment driveway (study int. #11) and northbound left-turns at Bradshaw Avenue / 8th Street (study int. #8). The purpose of this analysis is to determine if there is adequate storage capacity for back to back left-turn pockets along 8th Street between the El Dorado Family Apartment driveway and Bradshaw Avenue. On April 7, 2020, LLG Engineers prepared an Access Study for the El Dorado Family Apartments Phase 1 project. According to the Access Study, a dedicated 75-foot southbound left-turn pocket will be provided on 8th Street allowing left-turn access into the project site.

In the southbound approach, the left-turn queue is minimal since there is are 5 vehicles during the AM and 17 vehicles during the PM peak hour turning into the El Dorado Family Apartment site under the Horizon Year 2040 conditions. **Table 20** provides the 95th percentile queue lengths at this location. It may be noted that the Horizon Year 2040 analysis assumed all three phases of the El Dorado Family Apartment project i.e. worst-case scenario. Therefore, the 75-foot dedicated left-turn lane in the southbound approach provides adequate storage for vehicles entering the El Dorado Family Apartment site.

In the northbound approach, a 225-foot left-turn pocket is currently provided at Bradshaw Avenue / 8th Street. 95th percentile queue lengths at 8th Street / Bradshaw Avenue are provided in **Table 20** using the Synchro analysis software program. For unsignalized intersections, the 95th percentile queue length is reported in number of vehicles. Therefore, the queue length is converted from vehicles to feet by multiplying the number of vehicles by an estimated 25 feet per vehicle. The 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles. As shown in the Table 20, the 95th percentile queue for the northbound left-turn is 25 feet. Therefore, adequate storage is provided today and under Horizon Year 2040 Plus Project conditions for traffic making a northbound left-turn at Bradshaw Avenue / 8th Street.

TABLE 20 – INTERSECTION QUEUING ANALYSIS

Movement	No. Lanes	Storage Length Per Lane (ft)	Peak Hour Volume		95th % Queue (ft) [1]		Adequate Storage Provided?
			AM	PM	AM	PM	
OPENING YEAR 2022 PLUS PROJECT CONDITIONS							
8. Bradshaw Avenue / 8th Street							
NBL	1	225	55	125	25	25	Yes
11. 8th Street / El Dorado Family Apartment Driveway							
SBL	1	75	1	3	0	0	Yes
HORIZON YEAR 2040 PLUS PROJECT CONDITIONS							
8. Bradshaw Avenue / 8th Street							
NBL	1	125	67	151	25	25	Yes
11. 8th Street / El Dorado Family Apartment Driveway							
SBL	1	75	5	17	0	0	Yes

[1] Synchro reports the 95th percentile queue in number of vehicles. Queue Length in table assumes 25 feet per vehicle.

The queue analysis indicates that the 95th percentile queue for the northbound left-turn at 8th Street / Bradshaw Avenue intersection does not back-up and spillover into the through lane. In addition, the analysis shows the proposed 75-foot southbound left-turn lane serving the El Dorado Family Apartment project driveway is adequate to serve all three phases of the project. Therefore, vehicles turning left in the northbound approach at Bradshaw Avenue are not expected to conflict with vehicles turn left in the southbound approach at the El Dorado Family Apartment driveway.

5.13 SITE ACCESS & SIGHT DISTANCE

The project will be served by three driveways with two driveways on 10th Street and one driveway on 8th Street. The project driveway on 8th Street and the southern driveway on 10th Street will be full access driveways with gates. The northern driveway on 10th Street will be configurated as an exit only access and will be gated.

Sight distance was evaluated at the project driveways on 10th Street and 8th Street. Based on the American Association of State Highway and Transportation Officials (ASHTO) intersection sight distance standards using Table 9-6 from A Policy on Geometric Design of Highways and Streets, the minimum corner intersection sight distance at the new driveway on 8th Street is 445 feet in each direction based on a design speed of 40 MPH. The measured sight distance on 8th Street is more than 500 feet in each direction since the roadway is straight and flat. Therefore, there available sight distance is equal or greater than the required sight distance and drivers exiting onto 8th Street have adequate visibility at the project driveway.

On 10th Street, the minimum corner intersection sight distance at the new driveways is 280 feet in each direction based on a design speed of 25 MPH. 10th Street is relatively flat and straight providing good visibility to motorists exiting onto 10th Street. The measured sight distance is approximately 400 feet in each direction which exceeds the minimum sight distance requirements. Therefore, the available sight distance is equal to or greater than the required sight distance and drivers exiting onto 10th Street have adequate visibility at both of the project driveways.

6 SUMMARY & CONCLUSIONS

The project proposes a rezone of the property from CG-General Commercial to R3-Multiple Family Residential to allow for development of a 180-unit apartment complex in multiple buildings on a 19.3-acre site. A General Plan Amendment will also be required to change the existing General Plan land use designation from General Commercial to High Density Residential.

6.1 CEQA ANALYSIS SUMMARY

In December 2018, new California Environmental Quality Act (CEQA) guidelines were approved that shift transportation analysis from delay and operations to vehicle miles traveled (VMT) when evaluating transportation Impacts under CEQA. This change in methodology is a result of Senate Bill 743 (SB743), which was signed into law in September 2013. The Governor's Office of Planning and Research (OPR) released *Technical Advisory on Evaluating Transportation Impacts in CEQA* in December 2018 (Technical Advisory) that contains recommendations regarding assessment of VMT, screening criteria, thresholds of significance, and approach to mitigating impacts. Statewide implementation VMT as the metric for evaluating transportation impacts under CEQA occurred on July 1, 2020. The City is currently developing new traffic study guidelines to comply with SB743; however, the guidelines were not complete or accepted at the time this report was prepared. Therefore, OPR's Technical Advisory was used to evaluate the project's transportation impacts based on VMT. The proposed project is located within a VMT efficient area and is determined to have a less than significant impact and a detailed VMT analysis is not required.

6.2 LOCAL MOBILITY ASSESSMENT (LEVEL OF SERVICE) SUMMARY

While transportation impacts are based on VMT, the City also requires analysis of intersection and roadway segment operating conditions for their Local Mobility Assessment. The City has established LOS C as the standard for acceptable operating conditions. The results of the intersection analysis conducted in the Local Mobility Assessment show that nine of the eleven study intersections operate at LOS C or better under Existing and Existing Plus Project conditions except for Imperial Avenue (SR-86) / Cruickshank Drive and Imperial Avenue (SR-86) / Bradshaw Avenue which operate at LOS D with and without project traffic. For intersections operating at LOS D, the City considers 2 seconds of delay considerable and would require intersection improvements to offset the change in delay. The analysis shows that the project related traffic does not increase the change in delay by more than 2 seconds. Therefore, improvements at these locations are not warranted.

Under Opening Year 2022 conditions and Horizon Year 2040 conditions, Imperial Avenue (SR-86) / Cruickshank Drive and Imperial Avenue (SR-86) / Bradshaw Avenue continues to operate below the City's acceptable LOS C operating condition (LOS D and E). However, project related traffic does not increase the change in delay by more than 2 seconds. Therefore, improvements at these two intersections are not warranted.

At the unsignalized intersection of 8th Street/Project Driveway, a dedicated right-turn lane is assumed in the southbound approach under the Existing Plus Project, Opening Year 2022 Plus Project, and Horizon Year 2040 Plus Project conditions. However, this right-turn lane is not required to achieve acceptable operating conditions (LOS C or better) at this project access. Therefore, the dedicated right-turn lane is not required for operations but could be provided by the applicant as a project feature to improve vehicular access to the project site.

The results of the roadway segment analysis show that all nine (9) segments currently operate better than the City's LOS C standard. Under Existing Plus Project conditions, Opening Year 2022 Without and With Project conditions, and Horizon Year 2040 Without and With Project conditions, all nine of the study roadway segments continue to operate at LOS C or better. Therefore, improvements are not warranted on any of the study roadway segments.

6.3 SIGNAL WARRANT SUMMARY

The 2014 *California Manual on Uniform Traffic Control Devices* (*CA MUTCD*) contains minimum guidelines regarding traffic volumes, collisions, speeds, visibility and other criteria in order to satisfy the requirements for the recommendation of a traffic signal.

Both of the project driveways are planned to be stop controlled. The analysis shows both project driveways along 8th Street and 10th Street operate at an acceptable LOS C or better during the "Plus Project" scenarios Therefore, a signal warrant was not evaluated at the project driveways. A Peak Hour Warrant (CA MUTCD Warrant #3) was evaluated at the intersection of 8th Street / El Dorado Family Apartment Driveway (Int. #11) since this location is currently unsignalized and operating deficiently (LOS D) in the PM peak hour under Horizon Year 2040 conditions. However, this intersection did not meet signal warrants.

6.4 RECOMMENDED IMPROVEMENTS

The results of the analysis show that the project is not responsible for constructing any off-site improvements since they are not warranted in accordance with the County of Imperial *Traffic Study and Report Policy (TSRP)* revised on June 29, 2007.

The recommended site access driveway improvements for the Project are described below.

8th Street/Project Driveway (Study Int. #10)

- This main driveway may be configured as a full access driveway with side-street stop control on the eastbound approach and free-flow along 8th Street for all "Plus Project" conditions.
- 8th Street is currently four-lane divided Arterial with a two-way left-turn lane in the center allowing project traffic to make left-turning movements into the project site from the northbound approach.

10th Street/Southern Project Driveway (Study Int. #9)

- The secondary or southern driveway may be configured as a full access (two-way) driveway with side-street stop control on the eastbound and westbound approaches and free-flow along 10th Street for all "Plus Project" conditions. This driveway would be positioned directly across from the existing driveway serving the multi-family residential properties (Town Center Villa) on the west side of 10th Street.

- 10th Street is a low volume residential street providing two travel lanes (one in each direction) along the project frontage between Cruickshank Drive and Bradshaw Avenue. A dedicated left-turn lane in the southbound approach at this project access point is not necessary due to the low peak hour volumes on 10th Street (25 AM and 94 PM peak hour trips in northbound approach) and the low left-turning volume into the project site (3 AM and 11 PM peak hour trips turning left).
- The proposed gate should be recessed into the property at a minimum of 25 feet from the edge of curb to provide stacking for at least one vehicle waiting to enter through the gate so that a vehicle is not blocking through traffic on 10th Street or impede traffic entering Town Center Villa Apartments.

10th Street / Northern Project Driveway

- The northern project driveway is located approximately 100 feet north of the southern project driveway. This driveway will also be gated and configured as an exit only driveway.
- This traffic analysis assumes the estimated project traffic entering and exiting 10th Street will use the southern driveway to provide a conservative analysis.

The project driveways on 8th Street and 10th Street should be free and clear of any obstructions to provide adequate sight distance ensuing that exiting vehicles from the new driveways can adequately see not only other vehicles, but also pedestrians and bicyclists. Any landscaping and signage at the project driveways should not obstruct the drivers view from exiting the project site.

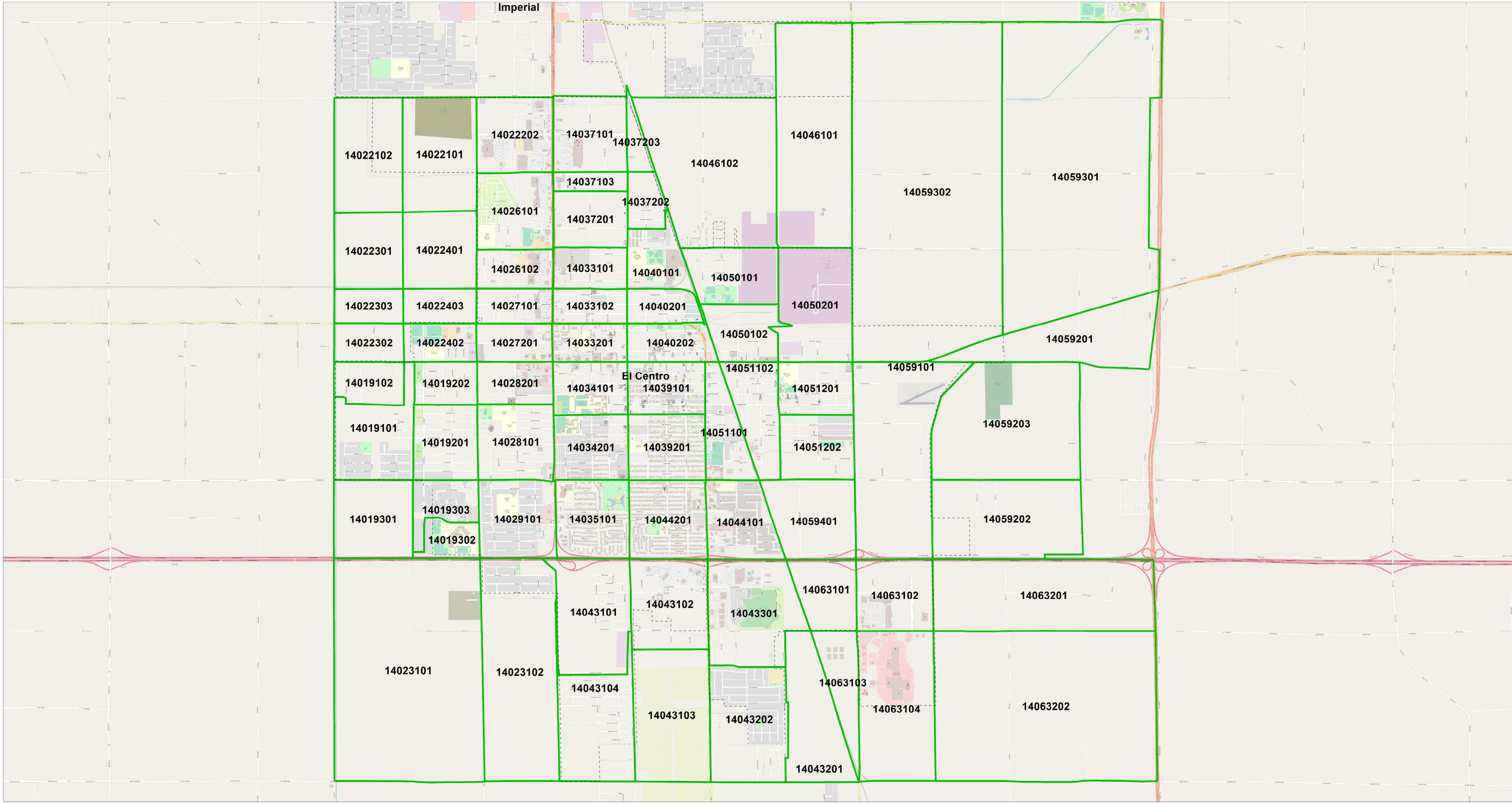
Michael Baker
INTERNATIONAL

Appendix A:
VMT Data

Imperial County			
ID	Purpose	Productions	Attractions
1	Home-based Work	913,730	825,819
2	Home-based School	44,574	43,761
3	Home-based University	71,853	82,302
4	Home-based Shopping	150,952	148,916
5	Home-based Social-Recreational	382,892	322,554
6	Home-based Serve Passenger	188,774	188,030
7	Home-based Other	439,625	389,888
8	Work-Based Other	91,882	84,229
9	Other Based Other	232,108	230,867
	Total VMT	2,516,390	2,316,364
	Total Home-based VMT		2,192,401
	Total Work-based VMT		917,700
	Total Population	183,309	
	Total Employees	67,100	
	Total Home-based VMT/Capita	**11.96**	
	Total Work-based VMT/Employee	**13.68**	

El Centro			
ID	Purpose	Productions	Attractions
1	Home-based Work	137,523	166,067
2	Home-based School	7,324	8,359
3	Home-based University	10,923	-
4	Home-based Shopping	25,708	39,831
5	Home-based Social-Recreational	58,602	75,936
6	Home-based Serve Passenger	35,005	54,724
7	Home-based Other	63,102	114,118
8	Work-Based Other	22,589	18,577
9	Other Based Other	60,899	60,634
	Total VMT	421,676	538,246
	Total Home-based VMT		338,188
	Total Work-based VMT		188,656
	Total Population	44,310	
	Total Employees	20,957	
	Total Home-based VMT/Capita	**7.63**	
	Total Work-based VMT/Employee	**9.00**	

		Compared to the Regional VMT/capita	
TAZ:	**14022202**		
Total Home-based VMT/Capita	**#DIV/0!**		
Total Work-based VMT/Employee	**10.28**		
TAZ:	**14037101**		
Total Home-based VMT/Capita	**8.38**	70%	Project Site TAZ
Total Work-based VMT/Employee	**11.25**		
TAZ:	**14037203**		
Total Home-based VMT/Capita	**#DIV/0!**		
Total Work-based VMT/Employee	**7.73**		
TAZ:	**14026102**		
Total Home-based VMT/Capita	**5.88**	49%	
Total Work-based VMT/Employee	**9.54**		
TAZ:	**14046102**		
Total Home-based VMT/Capita	**10.94**	91%	
Total Work-based VMT/Employee	**4.32**		
TAZ:	**14037103**		
Total Home-based VMT/Capita	**9.77**	82%	
Total Work-based VMT/Employee	**10.22**		
TAZ:	**14026101**		
Total Home-based VMT/Capita	**6.64**	56%	
Total Work-based VMT/Employee	**9.66**		
TAZ:	**14037201**		
Total Home-based VMT/Capita	**7.85**	66%	
Total Work-based VMT/Employee	**9.09**		
TAZ:	**14037202**		
Total Home-based VMT/Capita	**7.61**	64%	
Total Work-based VMT/Employee	**9.67**		
TAZ:	**14033101**		
Total Home-based VMT/Capita	**3.33**	28%	
Total Work-based VMT/Employee	**9.09**		
TAZ:	**14040101**		
Total Home-based VMT/Capita	**6.52**	55%	
Total Work-based VMT/Employee	**8.98**		
TAZ:	**14050101**		
Total Home-based VMT/Capita	**7.65**	64%	
Total Work-based VMT/Employee	**9.52**		
TAZ:	**14033102**		
Total Home-based VMT/Capita	**5.74**	48%	
Total Work-based VMT/Employee	**8.70**		
TAZ:	**14040201**		
Total Home-based VMT/Capita	**6.03**	50%	
Total Work-based VMT/Employee	**10.51**		
	Average	60%	


Imperial
El Centro
14022102
14022101
14022202
14037101
14037203
14046102
14046101
14059302
14059301
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14037202
14026101
14037201
14022301
14022401
14026102
14033101
14040101
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14043101
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14043104
14063103
14043103
14043202
14063104
14063202
14043201

Appendix B:
Traffic Scoping Memo

September 9, 2020

Angel Hernandez, AICP
Associate Planner – City of El Centro
1275 W. Main Street
El Centro, CA 92243

Subject: Town Center Village Traffic Scope of Work

Michael Baker International (Michael Baker) will be preparing the Transportation Impact Analysis (TIA) for the proposed Town Center Village project. The project site is located at the northeast corner of Bradshaw Avenue and N. 10th Street in the City of El Centro. The project proposes a rezone of the property from CG-General Commercial to R3-Multiple Family Residential. The applicant is requesting the rezoning to allow for development of a 180-unit apartment complex. A General Plan Amendment is required to change the existing General Plan land use designation from General Commercial to High Density Residential. It is our understanding the City is currently developing new traffic study guidelines to comply with SB-743 and to be consistent with the new California Environmental Quality Act (CEQA) requirements for evaluating transportation impacts using vehicle miles traveled (VMT) rather than level of service (LOS). Therefore, Michael Baker will work with City staff to determine an appropriate VMT threshold that is consistent with the Governor's Office of Planning and Research (OPR) latest Technical Advisory dated December 2018. For evaluating traffic operations within the study area, Michael Baker will comply with the County of Imperial Traffic Study and Report Policy revised June 29, 2007 which the City of El Centro currently uses. The purpose of this traffic study scope of work is to outline the methodology and contents to be included in the traffic report.

PROJECT DESCRIPTION

The project site is currently vacant and undeveloped. The project plans to construct 180 multi-family dwelling units on a 20-acre site. The proposed site plan is shown in **Exhibit 1. Exhibit 2** shows the project location east of 10th Street between Cruickshank Drive to the north and Bradshaw Avenue to the south. Vehicular access will be provided via one primary full access driveway on 8th Street and a secondary access on 10th Street.

TRIP GENERATION RATES

Michael Baker calculated the project trip generation to estimate the net new trips associated with the project. Trip rates from the *Institute of Transportation Engineers (ITE) Trip Generation Manual*, 10th Edition (ITE Trip Generation Manual) were utilized. **Table 1** provides a summary of the daily and peak hour trip rates during a weekday.

Table 1, Trip Generation Rates

Land Use	ITE Code	Daily Trip Rate	AM Peak Hour Rate		PM Peak Hour Rate	
			Total	In : Out	Total	In : Out
Multifamily Housing (Low Rise)	220 (1)	7.33 /DU	0.46 /DU	23% 77%	0.56 /DU	63% 37%

Source: ITE Trip Generation Manual, 10th Edition
(1) Rates shown are based on fitted curve equation.

FORECAST PROJECT TRIPS

Table 2 provides a summary of the expected trips generated on a weekday for the 180 multi-family dwelling units using the trip rates previously shown in **Table 1**. As shown in Table 2, the project is expected to generate approximately 1,320 daily trips with 83 AM (19 inbound and 64 outbound) peak hour trips and 101 PM (64 inbound and 37 outbound) peak hour trips.

Table 2, Town Center Village Trip Generation Summary

Land Use	Intensity	Daily Trips	AM Peak Hour Trips		PM Peak Hour Trips	
			Total	In : Out	Total	In : Out
Proposed Land Use						
Multi-Family Residential	180 DU	1,320	83	19 : 64	101	64 : 37

Notes:
DU = Dwelling Unit

VEHICLE MILES TRAVELED (VMT) SCOPE

The City of El Centro is currently undergoing a General Plan update at which time VMT thresholds and City-wide average VMT per capita will be established. Michael Baker will coordinate with City staff and Chen Ryan to obtain the information needed to prepare the VMT analysis. For the purposes of this traffic study, Michael Baker will use VMT per resident metric to compare the project VMT per capita to the City-wide average VMT per capita. If the City is not able to establish VMT thresholds during the preparation of this transportation study, Michael Baker will use the VMT thresholds established by OPR's Technical Advisory (December 2018).

LOCAL MOBILITY ANALYSIS (LMA) SCOPE AND KEY ASSUMPTIONS

In accordance with the County of Imperial Traffic Study and Report Policy, a Local Mobility Analysis (LMA) will be prepared for this project. According to this policy, projects that generate more than 400 daily residential trips are required to prepare a full LMA. The proposed project is forecast to generate 1,320 daily trips, therefore a full LMA is required. A General Plan Amendment is required to change the existing General Plan land use designation from General Commercial to High Density Residential. The following discusses the approach to preparing the traffic operations analysis and the key assumptions related to study area, traffic counts, trip distribution and study scenarios.

Trip Distribution

Trip distribution assumptions for the proposed project are based on a previous traffic study prepared for the same site. The project distribution is shown in **Exhibit 3**. As shown, 35% of project traffic is expected to travel south of SR-86 (Imperial Avenue), 28% south of 8th Street and 2% on 12th Street. To the north, 10% of project traffic is shown on SR-86 and an additional 10% is on 8th Street. Within the study area, 5%

of project traffic is captured locally by nearby retail businesses and an additional 10% travels west to other retail/commercial destinations.

Study Area

The extents of the proposed study area are consistent with the previous traffic study prepared for the same site.

As shown in **Exhibit 2**, the following ten (10) intersections will be analyzed in the LMA:

1.) Cruickshank Drive / Imperial Avenue (SR-86)
2.) Cruickshank Drive / 12th Street
3.) Cruickshank Drive / 10th Street
4.) Cruickshank Drive / 8th Street
5.) Bradshaw Road / Imperial Avenue (SR-86)
6.) Bradshaw Road / 12th Street
7.) Bradshaw Road / 10th Street
8.) Bradshaw Road / 8th Street
9.) 10th Street / Project Driveway
10.) 8th Street / Project Driveway

In addition, the following nine (9) roadway segments will be analyzed in the LMA:

A. Cruickshank Drive – between 12th St and 10th St
B. Cruickshank Drive – between 10th St and 8th St
C. Bradshaw Avenue – between 12th St and 10th St
D. Bradshaw Avenue – between 10th St and 8th St
E. Imperial Avenue – between Cruickshank Dr and Bradshaw Rd
F. Imperial Avenue – South of Bradshaw Rd
G. 8th Street – between Cruickshank Drive and Project Driveway
H. 8th Street – between Project Driveway and Bradshaw Rd
I. 8th Street – South of Bradshaw Rd

Study Scenarios

The following scenarios will be evaluated in the LMA:

- Existing Conditions
- Existing Plus Project
- Opening Year 2022 Without Project Conditions (Existing + Cumulative Projects)
- Opening Year 2022 Plus Project Conditions (Existing + Cumulative Projects + Project)
- Horizon Year 2040 Without Project Conditions
- Horizon Year 2040 Plus Project Conditions

Analysis Methodology and Project Improvements

Traffic operational impacts at study intersections will be analyzed in accordance with the County of Imperial Traffic Study and Report Policy revised June 29, 2007 which the City of El Centro currently uses. Study intersections will be analyzed using the Highway Capacity Manual 6th Edition (HCM 6) methodology and Synchro Version 10. Roadway segment analysis will be based on a ratio of daily volumes to LOS thresholds according to the City's roadway classifications found in the City of El Centro's General Plan Circulation Element. Based on the results of the analysis, project improvements will be identified and summarized in the LMA.

In addition to the operational analysis for study intersections, the following will also be evaluated:

Active Transportation

Existing and planned pedestrian and bicycle facilities will be documented within the LMA section of the report. In addition, the closest transit routes and stops will be documented as well as any planned trails or pathways near the project site.

Site Access and On-Site Circulation

The project site plan will be reviewed to determine the adequacy and operations of the proposed project's access points. Michael Baker will address potential circulation issues on-site, operational analysis, pedestrian and bicycle access and access to nearby transit facilities.

Data Collection

Due to COVID-19, Michael Baker will not collect new traffic counts at the study locations. A Traffic Impact Analysis was completed for this site by Linscott, Law & Green (LLG) in October 2016 which includes traffic volumes at the same study locations assumed in this scoping agreement. Therefore, traffic volume data from the LLG TIA collected on Tuesday, August 30, 2016 can be factored up and utilized for this study. After initial review of the LLG TIA, all cumulative projects that were assumed in the 2016 TIA have subsequently been constructed and are fully occupied. In order to estimate Existing 2020 traffic volumes, cumulative projects assumed in the LLG study will be added to the 2016 traffic counts and a growth rate of 1% per year for four years (total of 4%) will be applied to the combined 2016 existing volumes and cumulative traffic volumes. This will provide the most conservative estimate of current traffic volumes within the study area. It may be noted this methodology for estimating 2020 traffic counts was used in recent traffic studies (El Centro Library) within the City of El Centro.

Cumulative Projects

Michael Baker will work closely with the City to obtain a list of approved or pending projects that are forecast to contribute traffic to the study area. The study will identify the number of daily and peak hour trips forecast to be generated by cumulative projects using trip generation rates contained in the ITE Trip Generation Manual or other sources as directed by city staff. Approved and pending project trips will be assigned to the study intersections and roadway segments based on information provided in traffic studies for these projects. If a traffic study is not available, then Michael Baker will manually distribute the approved/pending project trips on the roadway network using sound engineering principles.

Horizon Year Analysis

Michael Baker will work closely with the City to obtain the most appropriate source for background long-range traffic projections for the study area. If a traffic model is not available, Michael Baker will work with City staff to determine an appropriate growth rate for development of the Horizon Year base traffic growth.

SUMMARY

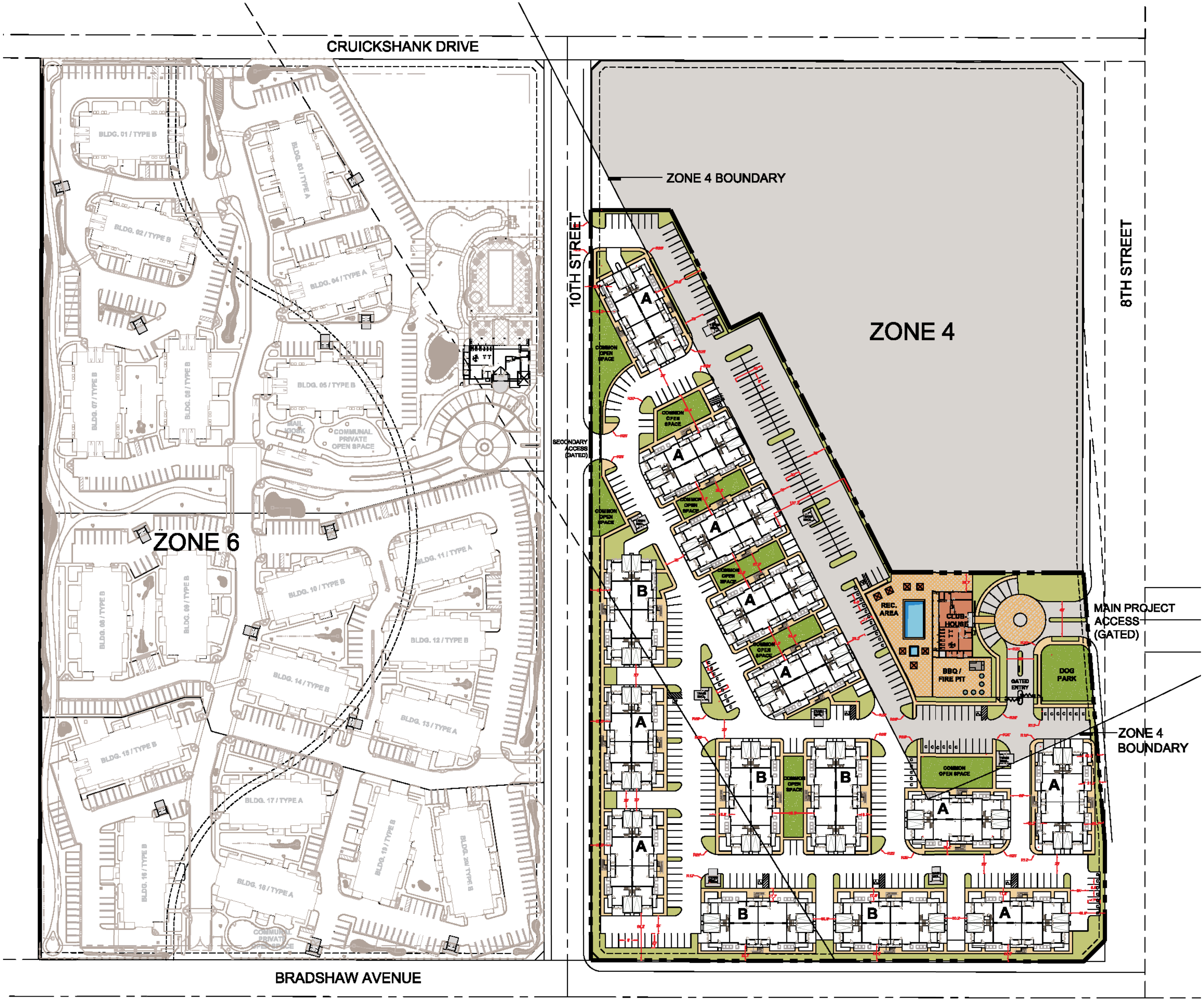
The project consists of a 180-unit apartment complex on a vacant site east of 10th Street bounded by Cruickshank Drive and Bradshaw Road. A General Plan Amendment is required to change the existing General Plan land use designation from General Commercial to High Density Residential. The project is forecast to generated 1,320 daily trips with 83 AM (19 inbound and 64 outbound) peak hour trips and 101 PM (64 inbound and 37 outbound) peak hour trips.

In addition to a VMT analysis required for CEQA, a Local Mobility Analysis will be prepared for the project. It is our understanding the City is currently developing new traffic study guidelines to comply with SB-743 and to be consistent with the new California Environmental Quality Act (CEQA) requirements for evaluating transportation impacts. Therefore, Michael Baker will work with City staff to determine an appropriate VMT threshold that is consistent with the Governor's Office of Planning and Research (OPR) latest Technical Advisory dated December 2018. In accordance with the County's policy, the findings of the VMT analysis and LMA analysis will be summarized in a comprehensive technical report.

If you have any questions related to this transportation scoping letter and Scoping Agreement, please contact me at (619) 456-1410 or jacob.swim@mbakerintl.com.

Sincerely,

Jacob Swim, TE
Transportation Planning Department
Michael Baker International



Michael Baker INTERNATIONAL

Site Plan

Exhibit 1

September 2020
H:\PDATA\180263_Town Center Village\Traffic\Exhibits

Not to Scale

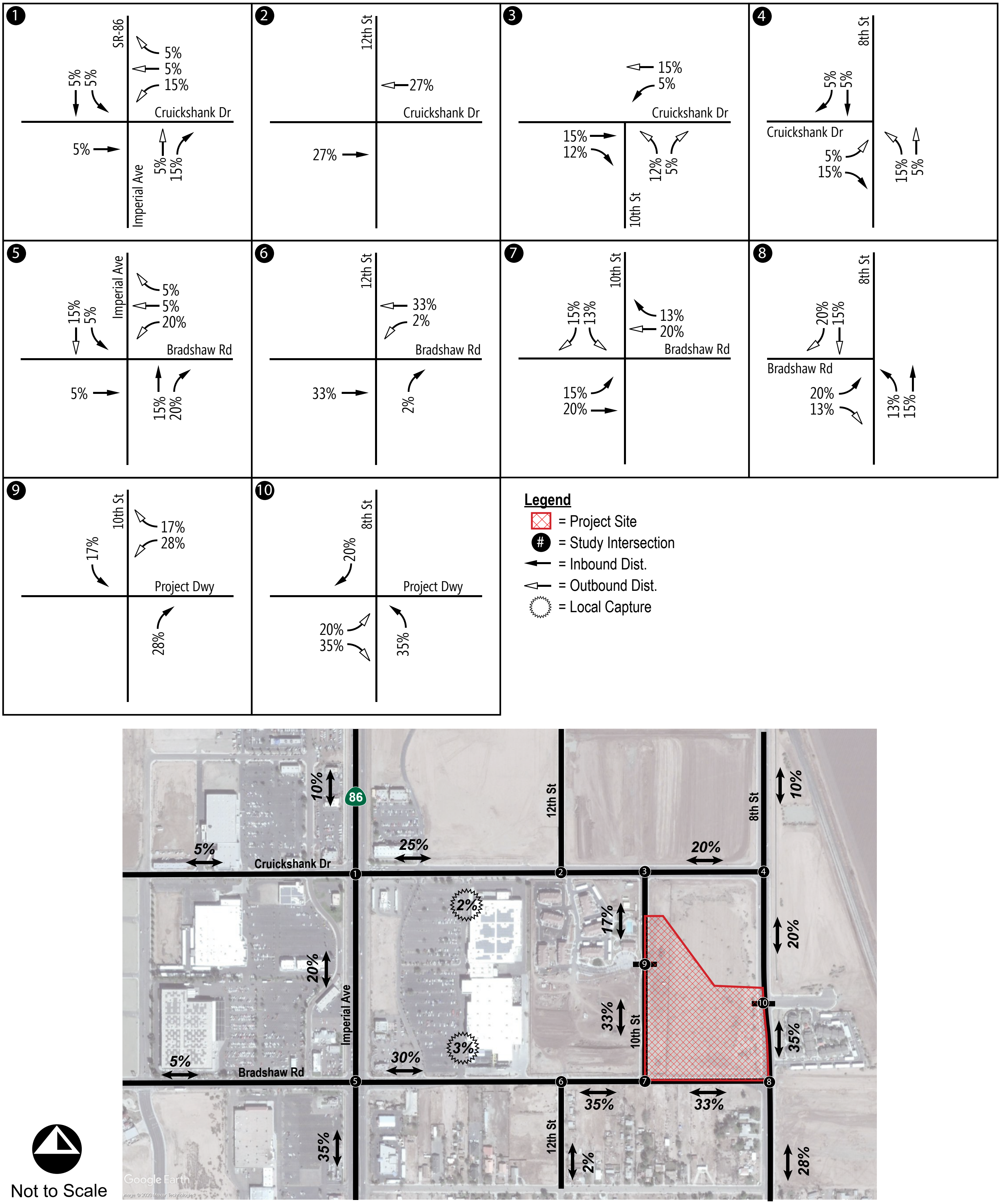
Legend
= Project Site
= Study Intersection
X = Study Segment

Michael Baker
INTERNATIONAL

Study Area

Exhibit 2

September 2020
H:\PDATA\180263_Town Center Village\Traffic\Exhibits



Michael Baker INTERNATIONAL

Project Distribution

September 2020
H:\PDATA\180263_Town Center Village\Traffic\Exhibits

Exhibit 3

Appendix C:
Traffic Count Data &
Signal Timing Sheets

LINSCOTT LAW & GREENSPAN
engineers

TECHNICAL APPENDICES

EL CENTRO TOWN CENTER REZONE

El Centro, California
October 10, 2016

LLG Ref. 3-16-2651

Linscott, Law &
Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
858.300.8810 F
www.llgengineers.com

APPENDIX A

INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Cruikshank Drive @ N Imperial Avenue (SR 86)

Date of Count: *Tuesday, August 30, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0557*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Cruikshank Drive @ N Imperial Avenue (SR 86)

AM Period (7:00 AM - 9:00 AM)	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	21	97	8	7	10	3	4	54	5	5	10	7	231
7:15 AM	24	151	8	3	10	5	5	88	11	2	10	13	330
7:30 AM	34	195	24	13	15	5	8	146	7	7	16	18	488
7:45 AM	52	289	33	13	13	9	10	108	23	9	15	21	595
8:00 AM	45	191	32	17	18	6	13	114	22	14	18	20	510
8:15 AM	36	146	27	25	18	3	12	103	12	14	26	24	446
8:30 AM	34	135	19	19	32	5	13	111	14	12	31	21	446
8:45 AM	26	154	22	17	23	5	9	101	21	20	21	20	439
Total	272	1,358	173	114	139	41	74	825	115	83	147	144	3,485

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	167	821	116	68	64	23	43	471	64	44	75	83	2,039
PHF	0.80	0.71	0.88	0.68	0.89	0.64	0.83	0.81	0.70	0.79	0.72	0.86	0.86
Movement PHF		0.74			0.84			0.90			0.79		0.86

PM Period (4:00 PM - 6:00 PM)	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	46	144	20	29	41	11	12	127	26	24	43	35	558
4:15 PM	53	164	27	32	30	10	7	129	30	19	29	42	572
4:30 PM	38	170	32	28	38	6	5	117	21	15	52	37	559
4:45 PM	54	136	31	24	35	2	8	107	30	19	45	49	540
5:00 PM	49	193	27	19	26	0	13	177	50	16	48	58	676
5:15 PM	49	153	35	33	47	4	17	153	38	17	43	46	635
5:30 PM	37	158	25	24	40	8	19	140	30	32	43	52	608
5:45 PM	48	112	32	23	29	7	12	123	38	18	48	56	546
Total	374	1230	229	212	286	48	93	1,073	263	160	351	375	4,694

PM Intersection Peak Hour : **5:00 PM - 6:00 PM** Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	183	616	119	99	142	19	61	593	156	83	182	212	2465
PHF	0.93	0.798	0.85	0.75	0.755	0.594	0.803	0.838	0.78	0.648	0.948	0.914	0.91
Movement PHF		0.85			0.77			0.84			0.94		0.91

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Cruikshank Drive @ 12th Street

Date of Count: *Tuesday, August 30, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0557*

Vehicular Count

LINSCOTT LAW & GREENSPAN engineers

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: Cruikshank Drive @ 12th Street

AM Period (7:00 AM - 9:00 AM)

	Southbound		Westbound			Eastbound		
	Right	Left	Right	Thru		Thru	Left	TOTAL
7:00 AM	0	0	0	17		13	0	30
7:15 AM	0	0	0	15		19	0	34
7:30 AM	0	0	0	38		27	0	65
7:45 AM	0	0	0	41		35	0	76
8:00 AM	0	0	0	43		32	0	75
8:15 AM	0	0	0	39		31	0	70
8:30 AM	0	0	0	32		31	0	63
8:45 AM	0	0	0	33		28	0	61
Total	0	0	0	258		216	0	474

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.94**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	0	0	0	161		125	0	286
PHF	#####	#####	#####	0.94		0.89	#####	0.94
Movement PHF	#DIV/0!			0.94		0.89		0.94

PM Period (4:00 PM - 6:00 PM)

	Southbound		Westbound			Eastbound		
	Right	Left	Right	Thru		Thru	Left	TOTAL
4:00 PM	0	0	0	55		56	0	111
4:15 PM	0	0	0	36		50	0	86
4:30 PM	0	0	0	40		57	0	97
4:45 PM	0	0	0	44		61	0	105
5:00 PM	1	0	0	30		72	1	104
5:15 PM	0	0	0	49		59	0	108
5:30 PM	0	0	0	58		59	0	117
5:45 PM	0	0	0	46		59	0	105
Total	1	0	0	358		473	1	833

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.93**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	1	0	0	181		251	1	434
PHF	0.25	#####	#####	0.78		0.872	0.25	0.93
Movement PHF	0.25			0.78		0.86		0.93

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Cruikshank Drive @ 8th Street

Date of Count: *Tuesday, August 30, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0557*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Cruikshank Drive @ 8th Street

AM Period (7:00 AM - 9:00 AM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
7:00 AM	7	46		31	10	6	7	107
7:15 AM	7	62		48	8	12	7	144
7:30 AM	15	74		75	23	14	13	214
7:45 AM	17	104		77	24	22	13	257
8:00 AM	16	72		50	27	14	18	197
8:15 AM	9	48		48	30	16	15	166
8:30 AM	16	49		40	16	15	16	152
8:45 AM	10	44		31	23	17	11	136
Total	97	499		400	161	116	100	1,373

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.81**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	57	298		250	104	66	59	834
PHF	0.84	0.72		0.81	0.87	0.75	0.82	0.81
Movement PHF		0.73		0.88		0.89		0.81

PM Period (4:00 PM - 6:00 PM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
4:00 PM	28	58		56	27	28	28	225
4:15 PM	11	56		54	25	25	25	196
4:30 PM	13	67		64	27	31	26	228
4:45 PM	9	71		71	35	30	31	247
5:00 PM	9	68		79	21	34	38	249
5:15 PM	16	66		89	33	29	30	263
5:30 PM	14	65		67	44	28	31	249
5:45 PM	16	46		64	30	26	33	215
Total	116	497		544	242	231	242	1,872

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.96**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	48	270		306	133	121	130	1008
PHF	0.75	0.951		0.86	0.756	0.89	0.855	0.96
Movement PHF		0.97		0.90		0.87		0.96

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

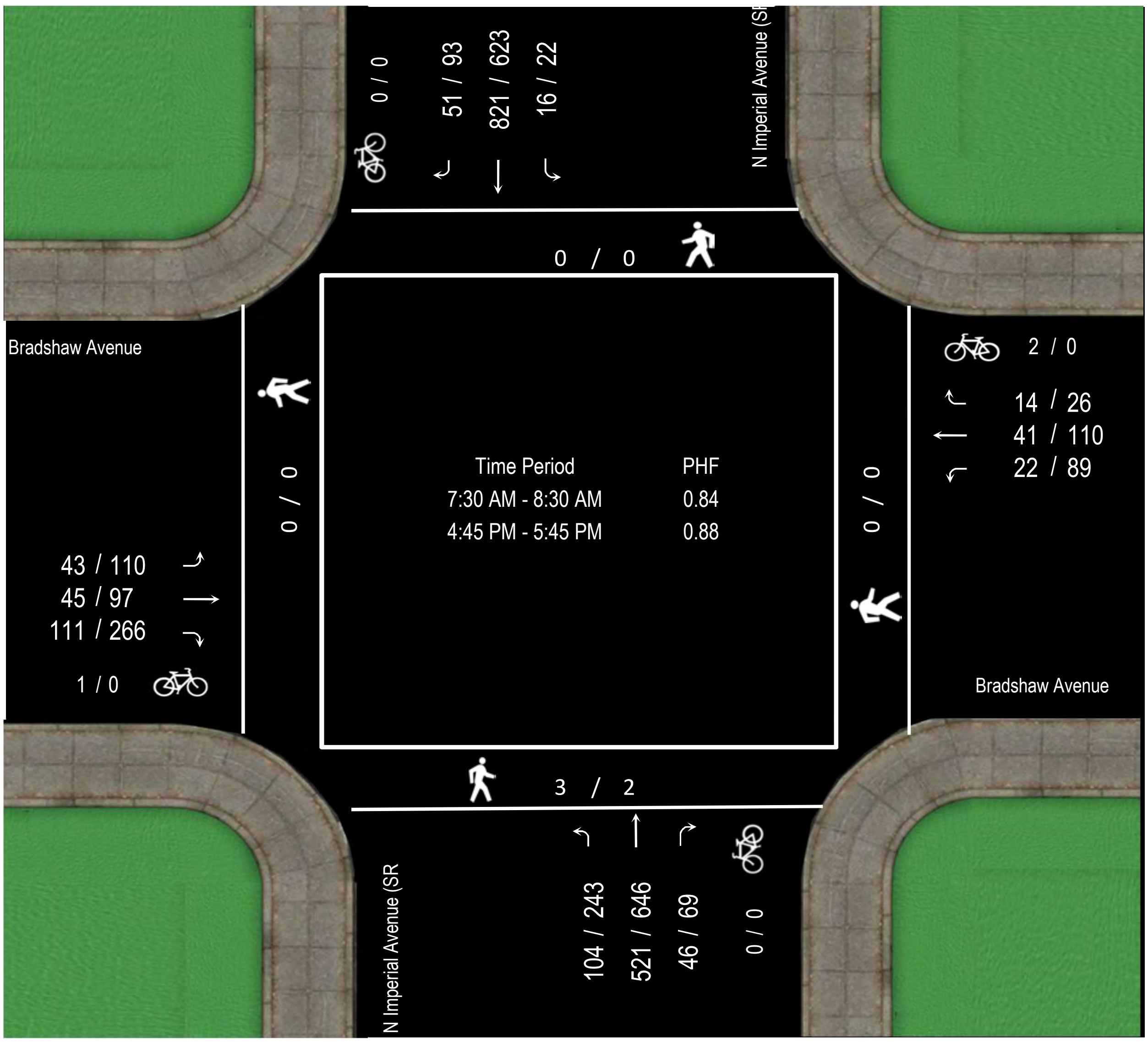
Location: Bradshaw Avenue @ N Imperial Avenue (SR 86)

Date of Count: *Tuesday, August 30, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0557*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Bradshaw Avenue @ N Imperial Avenue (SR 86)

AM Period (7:00 AM - 9:00 AM)	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	3	97	5	2	5	6	2	55	14	10	5	6	210
7:15 AM	4	153	1	1	6	5	9	93	14	17	5	10	318
7:30 AM	9	191	7	4	9	2	7	143	18	19	3	14	426
7:45 AM	18	286	3	2	12	7	11	131	23	31	13	8	545
8:00 AM	15	193	3	2	12	6	15	137	32	23	13	10	461
8:15 AM	9	151	3	6	8	7	13	110	31	38	16	11	403
8:30 AM	14	134	4	2	15	12	18	128	25	31	15	8	406
8:45 AM	8	167	4	3	10	13	20	114	27	26	17	14	423
Total	80	1,372	30	22	77	58	95	911	184	195	87	81	3,192

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.84**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	51	821	16	14	41	22	46	521	104	111	45	43	1,835
PHF	0.71	0.72	0.57	0.58	0.85	0.79	0.77	0.91	0.81	0.73	0.70	0.77	0.84
Movement PHF		0.72			0.92			0.91			0.77		0.84

PM Period (4:00 PM - 6:00 PM)	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	19	155	5	2	26	25	10	135	55	63	27	28	550
4:15 PM	25	165	3	3	12	16	15	143	50	47	28	20	527
4:30 PM	20	164	7	3	18	10	17	125	53	58	32	15	522
4:45 PM	25	128	4	6	23	18	17	114	64	67	25	25	516
5:00 PM	24	182	3	8	26	22	15	205	65	76	26	27	679
5:15 PM	21	146	7	7	29	29	17	175	66	58	24	26	605
5:30 PM	23	167	8	5	32	20	20	152	48	65	22	32	594
5:45 PM	16	119	2	3	13	22	10	145	50	73	36	25	514
Total	173	1226	39	37	179	162	121	1,194	451	507	220	198	4,507

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.88**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	93	623	22	26	110	89	69	646	243	266	97	110	2394
PHF	0.93	0.856	0.688	0.813	0.859	0.767	0.863	0.788	0.92	0.875	0.933	0.859	0.88
Movement PHF		0.88			0.87			0.84			0.92		0.88

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location:	Bradshaw Avenue	@	12th Street
Date of Count:	*Tuesday, August 30, 2016*		
Analysts:	*LV/CD*		
Weather:	*Sunny*		
AVC Proj No:	*16-0557*		

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Bradshaw Avenue @ 12th Street

AM Period (7:00 AM - 9:00 AM)							
	Westbound		Northbound		Eastbound		
	Thru	Left	Right	Left	Right	Thru	TOTAL
7:00 AM	4	0	0	0	2	7	13
7:15 AM	9	0	0	1	0	3	13
7:30 AM	9	0	1	0	0	7	17
7:45 AM	13	0	1	5	3	8	30
8:00 AM	19	0	0	4	4	11	38
8:15 AM	11	0	0	3	2	21	37
8:30 AM	15	0	1	3	2	15	36
8:45 AM	15	0	0	2	4	14	35
Total	95	0	3	18	17	86	219

AM Intersection Peak Hour : **8:00 AM - 9:00 AM** Intersection PHF : **0.96**

	Westbound		Northbound		Eastbound		TOTAL
	Thru	Left	Right	Left	Right	Thru	
Volume	60	0	1	12	12	61	146
PHF	0.79	#####	0.25	0.75	0.75	0.73	0.96
Movement PHF	0.79		0.81			0.79	0.96

PM Period (4:00 PM - 6:00 PM)							
	Westbound		Northbound		Eastbound		
	Thru	Left	Right	Left	Right	Thru	TOTAL
4:00 PM	21	0	1	1	4	33	60
4:15 PM	15	0	0	5	1	26	47
4:30 PM	13	0	0	1	1	38	53
4:45 PM	18	1	0	4	3	31	57
5:00 PM	22	0	1	7	6	23	59
5:15 PM	29	0	1	1	5	27	63
5:30 PM	23	0	1	10	2	33	69
5:45 PM	24	0	0	6	1	32	63
Total	165	1	4	35	23	243	471

PM Intersection Peak Hour : **5:00 PM - 6:00 PM** Intersection PHF : **0.92**

	Westbound		Northbound		Eastbound		TOTAL
	Thru	Left	Right	Left	Right	Thru	
Volume	98	0	3	24	14	115	254
PHF	0.845	#####	0.75	0.6	0.583	0.871	0.92
Movement PHF	0.84		0.61			0.92	0.92

LINSCOTT LAW & GREENSPAN
engineers

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Bradshaw Avenue @ 8th Street

Date of Count: *Tuesday, August 30, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0557*

LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: Bradshaw Avenue @ 8th Street

AM Period (7:00 AM - 9:00 AM)

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	1	54	0	0	0	0	0	46	3	5	0	0	109
7:15 AM	1	71	0	0	0	0	0	57	8	2	0	1	140
7:30 AM	4	92	0	0	0	0	0	97	5	7	0	1	206
7:45 AM	4	124	0	0	0	0	0	104	10	6	0	3	251
8:00 AM	4	82	0	0	0	0	0	87	15	6	0	3	197
8:15 AM	1	58	0	0	0	0	0	82	10	18	0	3	172
8:30 AM	4	62	0	0	0	0	0	61	13	14	0	1	155
8:45 AM	3	57	0	0	0	0	0	66	12	13	0	2	153
Total	22	600	0	0	0	0	0	600	76	71	0	14	1,383

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.82**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	13	356	0	0	0	0	0	370	40	37	0	10	826
PHF	0.81	0.72	#####	#####	#####	#####	#####	0.89	0.67	0.51	#####	0.83	0.82
Movement PHF		0.72			#DIV/0!			0.90			0.56		0.82

PM Period (4:00 PM - 6:00 PM)

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	5	81	0	0	0	0	0	84	16	25	0	7	218
4:15 PM	2	83	0	0	0	0	0	83	13	23	0	3	207
4:30 PM	1	90	0	0	0	0	0	92	13	35	0	3	234
4:45 PM	6	92	0	0	0	0	0	99	12	29	0	3	241
5:00 PM	1	102	0	0	1	0	0	109	21	18	0	4	256
5:15 PM	4	89	0	0	0	0	0	131	25	20	0	5	274
5:30 PM	4	79	0	0	0	0	0	107	19	29	0	4	242
5:45 PM	2	71	0	0	0	0	0	100	23	32	0	2	230
Total	25	687	0	0	1	0	0	805	142	211	0	31	1,902

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	15	362	0	0	1	0	0	446	77	96	0	16	1013
PHF	0.63	0.887	#####	#####	0.25	#####	#####	0.851	0.77	0.828	#####	0.8	0.92
Movement PHF		0.92			0.25			0.84			0.85		0.92

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: A. Cruikshank Drive 12th Street to 8th Street

Orientation: *East-West*

Date of Count: *Tuesday, August 30, 2016*

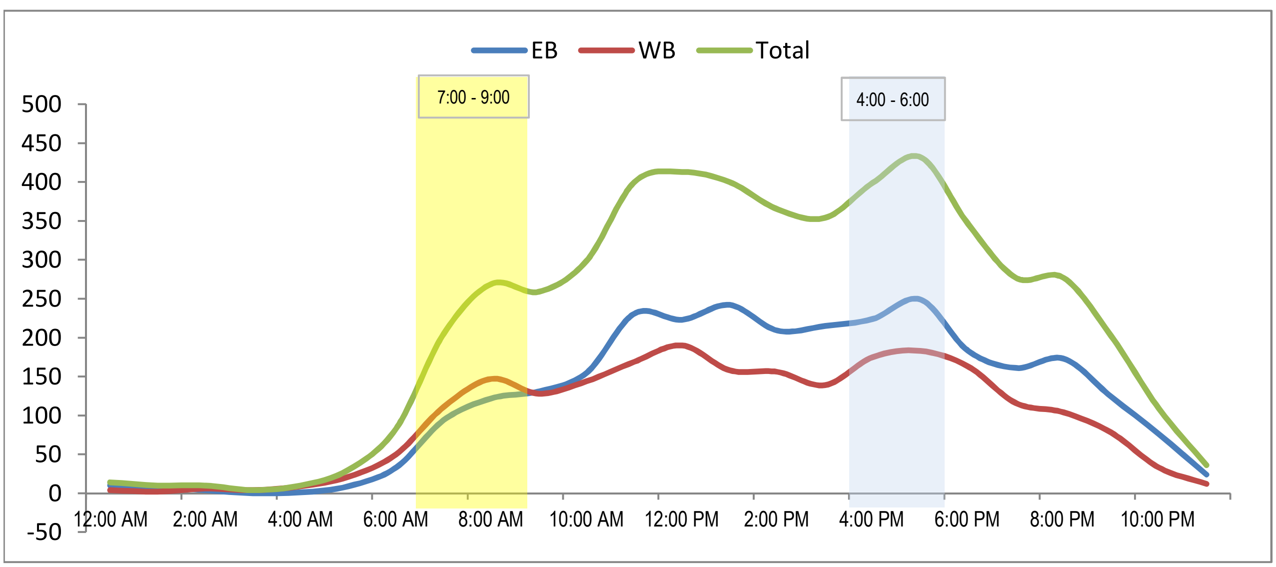
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *16-0557*

24 Hour Segment Volume												5,203
Time			Hourly Volume				Time			Hourly Volume		
			EB	WB	Total					EB	WB	Total
12:00 AM	-	1:00 AM	10	4	14		12:00 PM	-	1:00 PM	223	190	413
1:00 AM	-	2:00 AM	8	2	10		1:00 PM	-	2:00 PM	242	158	400
2:00 AM	-	3:00 AM	4	6	10		2:00 PM	-	3:00 PM	209	156	365
3:00 AM	-	4:00 AM	0	4	4		3:00 PM	-	4:00 PM	215	139	354
4:00 AM	-	5:00 AM	1	9	10		4:00 PM	-	5:00 PM	224	175	399
5:00 AM	-	6:00 AM	9	21	30		5:00 PM	-	6:00 PM	249	183	432
6:00 AM	-	7:00 AM	33	50	83		6:00 PM	-	7:00 PM	183	163	346
7:00 AM	-	8:00 AM	94	111	205		7:00 PM	-	8:00 PM	161	116	277
8:00 AM	-	9:00 AM	122	147	269		8:00 PM	-	9:00 PM	173	104	277
9:00 AM	-	10:00 AM	131	128	259		9:00 PM	-	10:00 PM	124	78	202
10:00 AM	-	11:00 AM	155	144	299		10:00 PM	-	11:00 PM	76	33	109
11:00 AM	-	12:00 PM	231	169	400		11:00 PM	-	12:00 AM	24	12	36
Total			798	795	1,593		Total			2,103	1,507	3,610

24-Hour	EB	Volume	2,901	24-Hour	WB	Volume	2,302



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: B. Bradshaw Avenue 12th Street to 8th Street

Orientation: *East-West*

Date of Count: *Tuesday, August 30, 2016*

Analysts: *DASH*

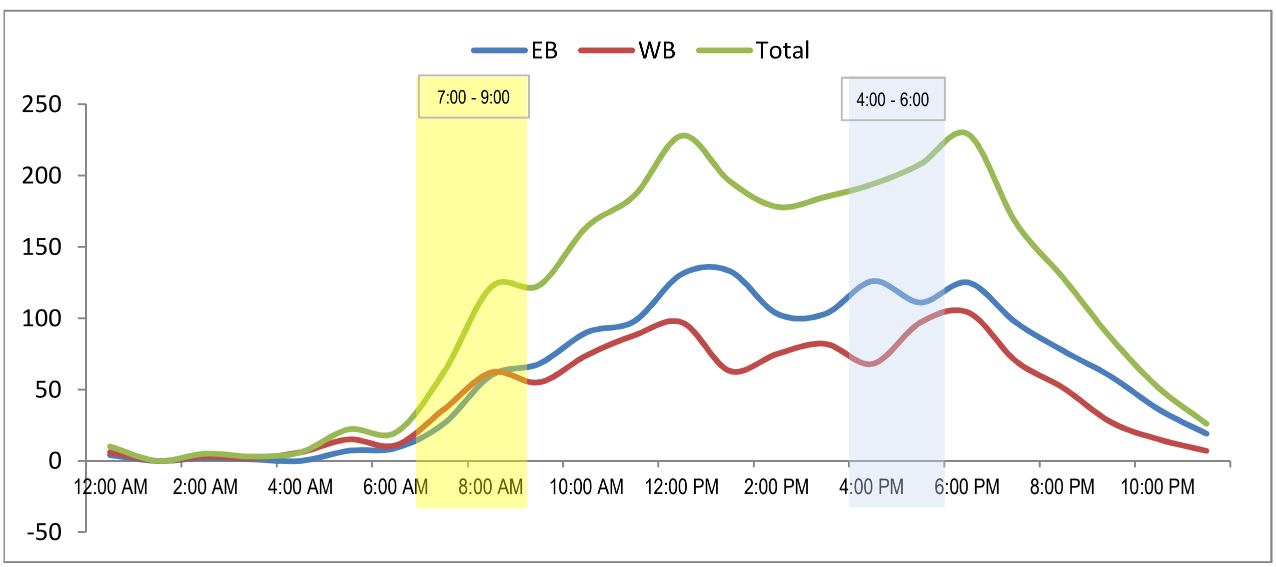
Weather: *Sunny*

AVC Proj. No: *16-0557*

24 Hour Segment Volume 2,599

Time	Hourly Volume EB	WB	Total	Time	Hourly Volume EB	WB	Total
12:00 AM - 1:00 AM	4	6	10	12:00 PM - 1:00 PM	131	97	228
1:00 AM - 2:00 AM	0	0	0	1:00 PM - 2:00 PM	133	63	196
2:00 AM - 3:00 AM	2	3	5	2:00 PM - 3:00 PM	103	75	178
3:00 AM - 4:00 AM	1	2	3	3:00 PM - 4:00 PM	103	82	185
4:00 AM - 5:00 AM	0	6	6	4:00 PM - 5:00 PM	126	68	194
5:00 AM - 6:00 AM	7	15	22	5:00 PM - 6:00 PM	111	97	208
6:00 AM - 7:00 AM	9	11	20	6:00 PM - 7:00 PM	125	104	229
7:00 AM - 8:00 AM	26	36	62	7:00 PM - 8:00 PM	97	70	167
8:00 AM - 9:00 AM	60	62	122	8:00 PM - 9:00 PM	77	51	128
9:00 AM - 10:00 AM	68	55	123	9:00 PM - 10:00 PM	59	27	86
10:00 AM - 11:00 AM	90	74	164	10:00 PM - 11:00 PM	36	15	51
11:00 AM - 12:00 PM	98	88	186	11:00 PM - 12:00 AM	19	7	26
Total	**365**	**358**	**723**	**Total**	**1,120**	**756**	**1,876**

24-Hour EB Volume 1,485 **24-Hour WB Volume 1,114**



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: C. 8th Street Cruikshank Drive to Bradshaw Avenue

Orientation: *North-South*

Date of Count: *Tuesday, August 30, 2016*

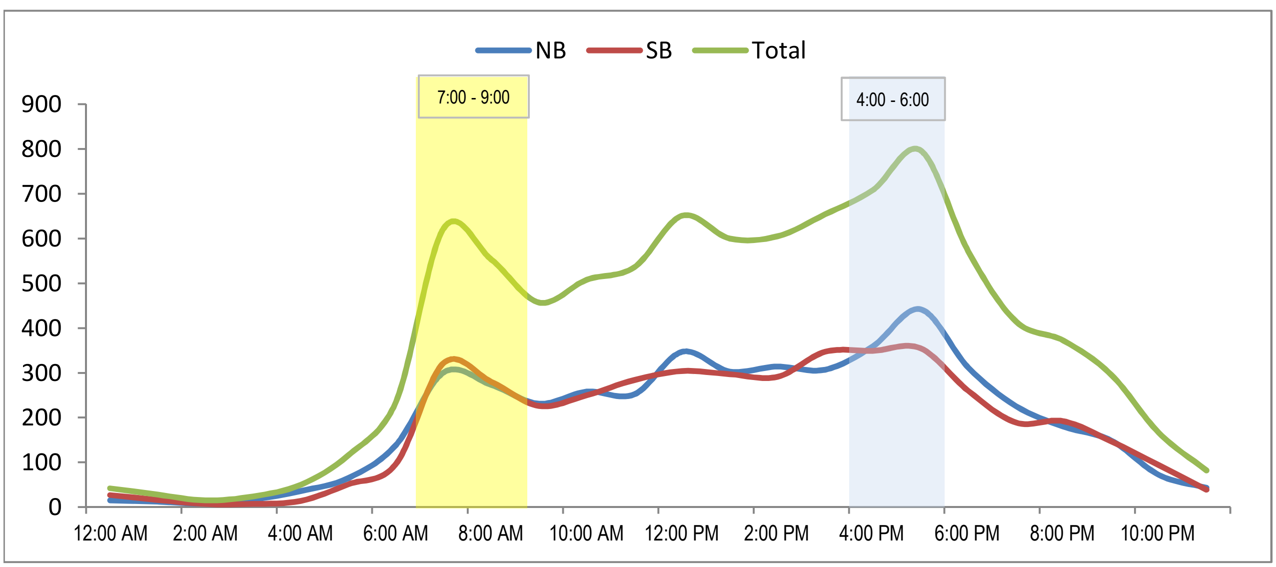
Analysts: *DASH*

Weather: *Sunny*

AVC Proj. No: *16-0557*

24 Hour Segment Volume								9,106
Time	Hourly Volume				Time	Hourly Volume		
	NB	SB	Total			NB	SB	Total
12:00 AM - 1:00 AM	15	27	42		12:00 PM - 1:00 PM	347	304	651
1:00 AM - 2:00 AM	12	16	28		1:00 PM - 2:00 PM	303	297	600
2:00 AM - 3:00 AM	8	7	15		2:00 PM - 3:00 PM	314	291	605
3:00 AM - 4:00 AM	17	7	24		3:00 PM - 4:00 PM	307	347	654
4:00 AM - 5:00 AM	36	14	50		4:00 PM - 5:00 PM	359	349	708
5:00 AM - 6:00 AM	65	51	116		5:00 PM - 6:00 PM	442	355	797
6:00 AM - 7:00 AM	139	97	236		6:00 PM - 7:00 PM	312	260	572
7:00 AM - 8:00 AM	301	322	623		7:00 PM - 8:00 PM	226	189	415
8:00 AM - 9:00 AM	273	280	553		8:00 PM - 9:00 PM	180	192	372
9:00 AM - 10:00 AM	231	226	457		9:00 PM - 10:00 PM	149	147	296
10:00 AM - 11:00 AM	258	250	508		10:00 PM - 11:00 PM	72	94	166
11:00 AM - 12:00 PM	252	284	536		11:00 PM - 12:00 AM	43	39	82
Total	**1,607**	**1,581**	**3,188**		**Total**	**3,054**	**2,864**	**5,918**

24-Hour	NB	Volume	4,661	24-Hour	SB	Volume	4,445



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: D. 8th Street south of Bradshaw Avenue

Orientation: *North-South*

Date of Count: *Tuesday, August 30, 2016*

Analysts: *DASH*

Weather: *Sunny*

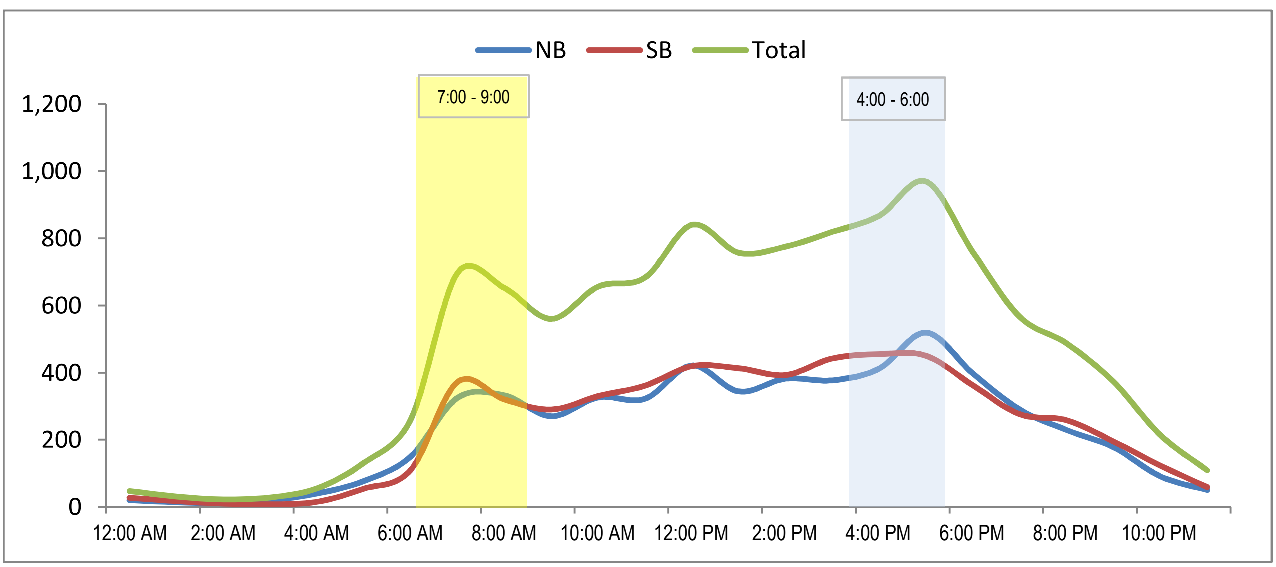
AVC Proj. No: *16-0557*

24 Hour Segment Volume: 11,357

Time			Hourly Volume NB	SB	Total
12:00 AM	-	1:00 AM	20	27	47
1:00 AM	-	2:00 AM	14	17	31
2:00 AM	-	3:00 AM	12	10	22
3:00 AM	-	4:00 AM	20	8	28
4:00 AM	-	5:00 AM	40	15	55
5:00 AM	-	6:00 AM	77	54	131
6:00 AM	-	7:00 AM	150	110	260
7:00 AM	-	8:00 AM	325	372	697
8:00 AM	-	9:00 AM	332	320	652
9:00 AM	-	10:00 AM	270	290	560
10:00 AM	-	11:00 AM	326	330	656
11:00 AM	-	12:00 PM	322	361	683
Total			**1,908**	**1,914**	**3,822**

Time			Hourly Volume NB	SB	Total
12:00 PM	-	1:00 PM	421	419	840
1:00 PM	-	2:00 PM	344	413	757
2:00 PM	-	3:00 PM	382	393	775
3:00 PM	-	4:00 PM	377	442	819
4:00 PM	-	5:00 PM	412	455	867
5:00 PM	-	6:00 PM	519	450	969
6:00 PM	-	7:00 PM	397	362	759
7:00 PM	-	8:00 PM	290	276	566
8:00 PM	-	9:00 PM	229	258	487
9:00 PM	-	10:00 PM	178	195	373
10:00 PM	-	11:00 PM	91	123	214
11:00 PM	-	12:00 AM	50	59	109
Total			**3,690**	**3,845**	**7,535**

24-Hour NB Volume 5,598 | **24-Hour SB Volume 5,759**



SIGNAL TIMING

8th Street / Cruickshank Drive

Group Assignment: **None**
Field Master Assignment: **None**
System Reference Number:

N/S Street Name: **8th Street**
E/W Street Name: **Cruickshank Drive**

Last Database Change: **3/27/2013 11:30**

Change Record					
Change	By	Date	Change	By	Date

Notes: RBF 032713

Drop Number	1	<C+0+0>
Zone Number		<C+0+1>
Area Number	1	<C+0+2>
Area Address		<C+0+3>
QuicNet Channel		(QuicNet)

Communication Addresses

Manual Plan		<C+A+1>
Manual Offset		<C+B+1>

Manual Selection

Max Initial	20	<F+0+E>
Red Revert	5.0	<F+0+F>
All Red Start	5.0	<F+C+0>

Start / Revert Times

Row	Column Numbers --->	1	2	3	4	5	6	7	8
	Phase Names --->		NBT		EB	NBL	SBT		
0	Ped Walk		7		7	0	7		
1	Ped FDW		22		23	0	22		
2	Min Green		8		6	4	8		
3	Type 3 Limit		0		0	0	0		
4	Added Initial		0.0		0.0	0.0	0.0		
5	Veh Extension		5.0		4.0	2.0	5.0		
6	Max Gap		5.0		4.0	2.0	5.0		
7	Min Gap		2.0		2.0	2.0	2.0		
8	Max Limit		50		35	20	50		
9	Max Limit 2		0		0	0	0		
A									
B	Call To Phase		0		0	0	0		
C	Reduce By		0.1		0.1	0.1	0.1		
D	Reduce Every		1.0		1.0	1.0	1.0		
E	Yellow Change		4.4		4.5	3.0	4.4		
F	Red Clear		1.0		1.0	1.0	1.0		

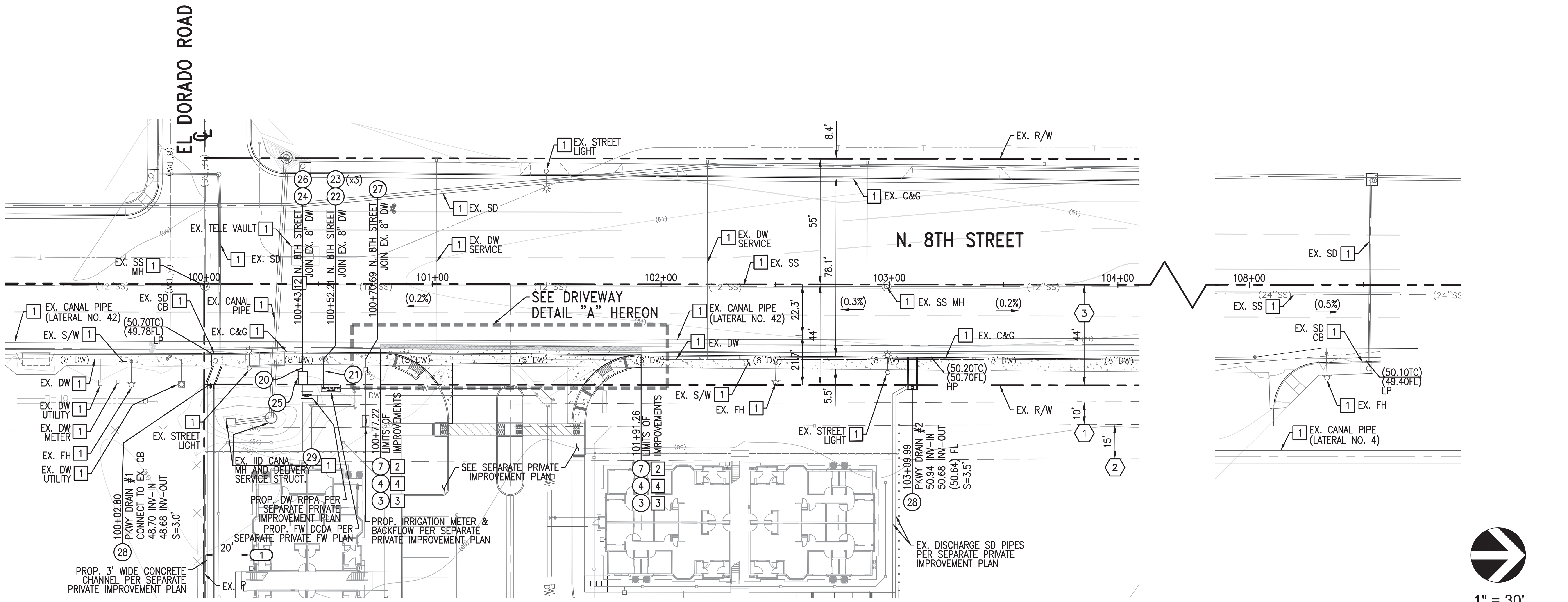
Phase Timing - Bank 1 <F Page>

Preempt Timing	E	Phase Functions	F	Row
RR-1 Delay	0	Permit	2 456	0
RR-1 Clear	10	Red Lock	5	1
EV-A Delay	0	Yellow Lock		2
EV-A Clear	1	Min Recall	2 6	3
EV-B Delay	0	Ped Recall		4
EV-B Clear	1	View Set Peds		5
EV-C Delay	0	Rest In Walk		6
EV-C Clear	1	Red Rest		7
EV-D Delay	0	Dual Entry		8
EV-D Clear	1	Max Recall		9
RR-2 Delay	0	Soft Recall		A
RR-2 Clear	11	Max 2		B
View EV Delay	- - -	Cond. Service		C
View EV Clear	- - -	Man Cntrl Calls		D
View RR Delay	- - -	Yellow Start	4	E
View RR Clear	- - -	First Phases	2 6	F

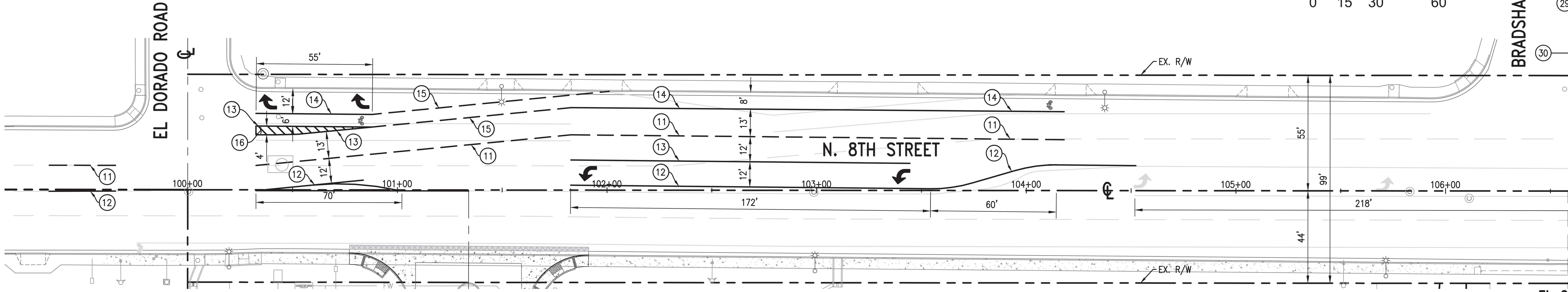
Preempt Timing **Phase Functions** <F Page>

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

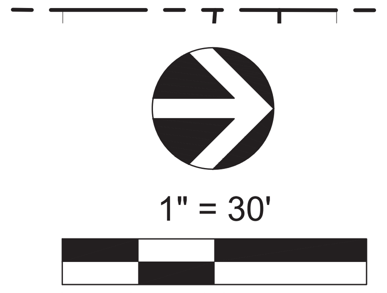
Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C



N. 8TH STREET - STREET & UTILITY PLAN



N. 8TH STREET - STRIPING PLAN



PUBLIC STREET CONSTRUCTION NOTES:

1. CONSTRUCT STREET PAVING PER CITY OF EL CENTRO STD. EC-100 & EC-101 ON SHEET C10.1
2. CONNECT PROPOSED STREET PAVING TO EXISTING STREET PER COUNTY OF IMPERIAL DWG. NO. 453 ON SHEET C10.1.
3. CONSTRUCT 6" CURB & GUTTER (TYPE A-6) PER CITY OF EL CENTRO STD. EC-200 ON SHEET C10.1.
4. CONSTRUCT SIDEWALK PER CITY OF EL CENTRO STD. EC-400 ON SHEET C10.1.
5. CONSTRUCT MODIFIED 4" AC DIKE/WEDGE CURB PER COUNTY OF IMPERIAL DWG. NO. 402 ON SHEET C10.2.
6. ADJUST EXISTING MANHOLE OR VALVE TO GRADE.
7. CONSTRUCT CROSS GUTTER PER CITY OF EL CENTRO STD. EC-270 ON SHEET C10.1.
8. CONSTRUCT CURB RAMP PER CITY OF EL CENTRO STD. EC-403-1 & EC-403-8 ON SHEET C10.1.
9. CONSTRUCT 6" CURB ONLY, TYPE A1-6(150), PER SPPWC STD. 120-2 ON SHEET C10.2.
10. CONSTRUCT CURB TRANSITION PER DETAIL ON SHEET C10.4. LENGTH PER PLAN.

PUBLIC STRIPING CONSTRUCTION NOTES:

11. INSTALL 4" WHITE DASHED CENTER LINE PER CALTRANS STD. A20A, DETAIL 9.
12. INSTALL YELLOW MEDIAN STRIPING PER CALTRANS STD. A20B, DETAIL 29.
13. INSTALL 8" WHITE CHANNELIZING LINE PER CALTRANS STD. A20D, DETAIL 38.
14. INSTALL 6" WHITE BIKE LANE PER PER CALTRANS STD. A20B, DETAIL 39.
15. INSTALL DASHED 6" WHITE BIKE LANE PER PER CALTRANS STD. A20B, DETAIL 39A.
16. INSTALL WHITE DIAGONAL CROSS HATCH STRIPING.

PUBLIC UTILITY CONSTRUCTION NOTES:

20. INSTALL 4" PVC PIPE C-900 (CLASS 200). TRENCH AND BEDDING PER COUNTY OF IMPERIAL DWG. NO. 500 ON SHEET C10.2.
21. INSTALL 8" PVC PIPE C-900 (CLASS 200). TRENCH AND BEDDING PER COUNTY OF IMPERIAL DWG. NO. 500 ON SHEET C10.2.
22. INSTALL D.I. 8"X8"X8" TEE (MJ X MJ) WITH RESTRAINED JOINTS AND THRUST BLOCK PER IMPERIAL COUNTY STD. GATEWAY-100 & 105 ON SHEET C10.2.
23. INSTALL 8" RESILIENT WEDGE GATE VALVE PER IMPERIAL COUNTY DWG. NO. GATEWAY-125 ON SHEET C10.2.
24. INSTALL 4" RESILIENT WEDGE GATE VALVE PER IMPERIAL COUNTY DWG. NO. GATEWAY-125 ON SHEET C10.2.
25. INSTALL 4" MUELLER SYSTEM COMBO HBMAG MASTER WATER METER. CONSULT WITH ENGINEER FOR CHANGES.
26. INSTALL 4" HOT TAP TEE FOR DOMESTIC WATER SERVICE CONNECTION.
27. INSTALL 2" HOT TAP TEE AND SERVICE FOR IRRIGATION PURPOSES WITH 2" WATER METER PER CITY OF EL CENTRO STD. EC-704 ON SHEET C10.2 AND 2" REDUCED PRESSURE TYPE BACKFLOW DEVICE PER SEPARATE LANDSCAPE PLANS.
28. CONSTRUCT MODIFIED PARKWAY DRAIN (TYPE 1) PER SPPWC STD. 151-2 ON SHEET C10.3. WIDTH (S) PER PLAN.
29. CONTRACTOR SHALL VERIFY IF ANY ACTIVE DOMESTIC WATER SERVICES IN USE FROM THE EXISTING IID 66" DATE CANAL, MANHOLE AND DELIVERY SERVICE. OWNER AN/OR CONTRACTOR SHALL COORDINATE THE ABANDONMENT OF THE EXISTING UNUSED DELIVERY 39 SERVICES WITH IID PRIOR TO CONSTRUCTION. IID TO REMOVE SERVICES FROM DELIVERY. OWNER WILL BE FINANCIALLY RESPONSIBLE FOR COST OF REMOVAL.
30. INSTALL D.I. 8"X8"X4" TEE (MJ X MJ) WITH RESTRAINED JOINTS AND THRUST BLOCK PER IMPERIAL COUNTY STD. GATEWAY-100 & 105 ON SHEET C10.2.

EL CENTRO WATER NOTES:

1. ALL WATER LINES INSTALLED SHALL BE HYDROSTATICALLY TESTED FOR LEAKAGE BASED ON THE "WATER PRESSURE TEST" SECTION OF THE MOST CURRENT VERSION OF THE "GREENBOOK: STANDARD SPECIFICATIONS FOR WORKS CONSTRUCTION."
2. ALL WATER LINES INSTALLED SHALL BE HIGH-CHLORINE AND BAC-T TESTED. TEST RESULTS TO BE REVIEWED FOR APPROVAL BEFORE THE WATERLINE CAN BE ACTIVATED.
3. DETECTABLE TAPE SHALL BE INSTALLED 1'-0" ABOVE THE WATERLINE.
4. ALL COMPONENTS INSTALLED ALONG THE WATERLINE (I.E. FITTINGS, GATE VALVES, COUPLINGS, BURY ELS, ETC.) SHALL BE WRAPPED IN 8 MIL POLYETHYLENE PLASTIC BEFORE ANY BACKFILL IS COMPLETED.
5. CONTRACTOR SHALL COORDINATE WITH WATER DEPARTMENT FOR CONNECTIONS AND BACKFLOW PLACEMENT PRIOR TO CONSTRUCTION AND CONSULT WITH ENGINEER FOR CHANGES.

NOTES TO CONTRACTOR:

1. A TRAFFIC CONTROL PLAN IS REQUIRED FOR STRIPING WORK AND WATER SERVICE CONNECTIONS. CONTRACTOR SHALL PROVIDE PLAN FOR REVIEW AND APPROVAL PRIOR TO ISSUANCE OF ENCROACHMENT PERMIT.
2. BFP SHOULD BE LEAD FREE. A BFP DRAWING DETAIL PER CITY STANDARD DETAILS AND PRODUCT SUBMITTAL SPECIFICATIONS SHALL BE SUBMITTED TO CITY FOR REVIEW AND APPROVAL AS A PART OF THE ENCROACHMENT PERMIT.
3. INSPECTION FEES FOR SERVICE CONNECTIONS SHALL BE PAID PRIOR TO THE ISSUANCE OF THE ENCROACHMENT PERMIT.
4. TRAFFIC STRIPING PLAN SHALL BE STAMPED BY A LICENSED CIVIL ENGINEER/TRAFFIC ENGINEER.

EXISTING EASEMENTS:

1. A RIGHT OF WAY 10 FEET IN WIDTH ACROSS FOR CANAL, TELEPHONE AND/OR ELECTRIC POWER LINE, TOGETHER WITH CONVENIENT MEANS OF INGRESS AND EGRESS, AS CONVEYED TO IMPERIAL IRRIGATION DISTRICT BY DEED RECORDED JUNE 18, 1937 IN BOOK 458, PAGE 299 OF OFFICIAL RECORDS.
2. A RIGHT OF WAY 15 FEET IN WIDTH ACROSS FOR CANAL, TELEPHONE AND/OR ELECTRIC POWER LINES, TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS, AS CONVEYED TO THE IMPERIAL IRRIGATION DISTRICT BY DEED RECORDED MARCH 24, 1941 IN BOOK 567, PAGE 92 OF OFFICIAL RECORDS.
3. AN EASEMENT FOR A PUBLIC HIGHWAY AND INCIDENTAL PURPOSES IN THE DOCUMENT RECORDED MARCH 22, 1979 AS INSTRUMENT NO. 64 IN BOOK 1431, PAGE 367 OF OFFICIAL RECORDS.

PROPOSED EASEMENTS:

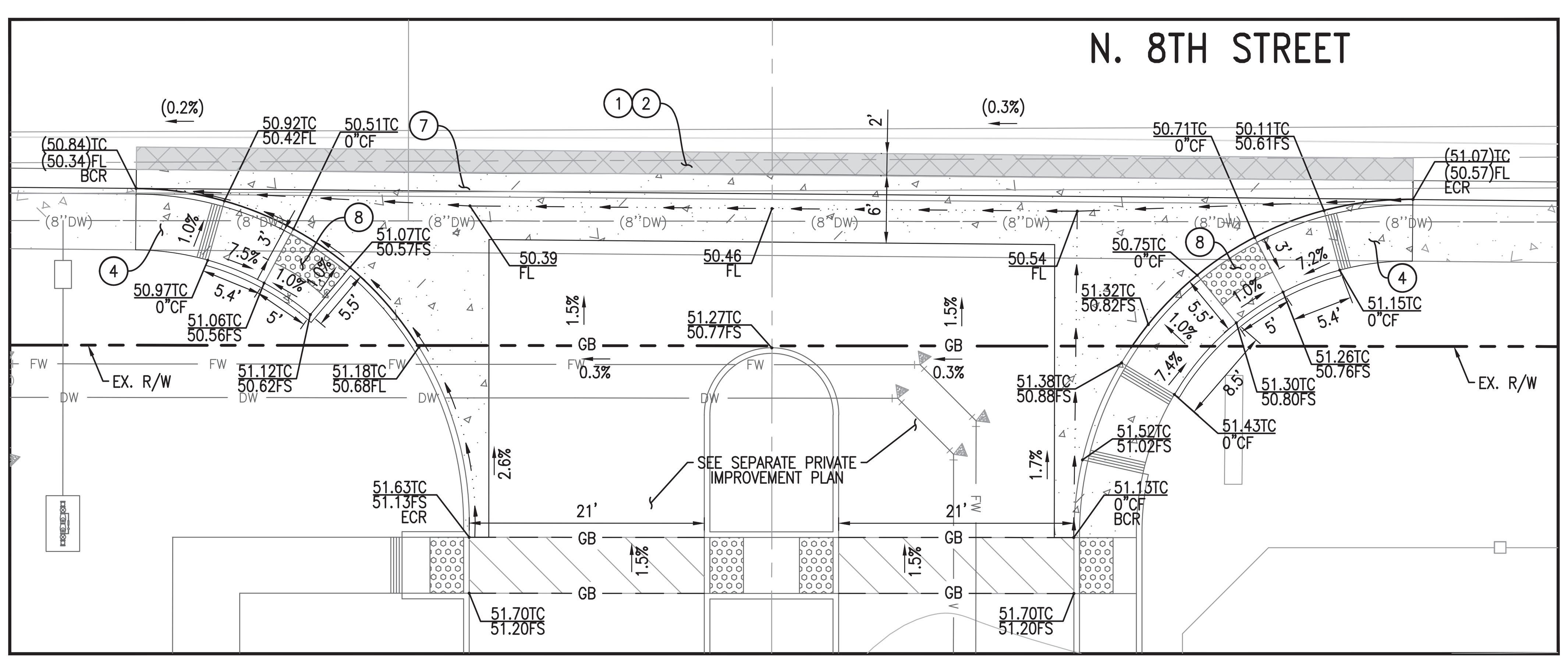
1. 20' WIDE PUBLIC UTILITIES EASEMENT FOR DRAINAGE TO BE CONVEYED TO THE CITY OF EL CENTRO.

STREET LEGEND:

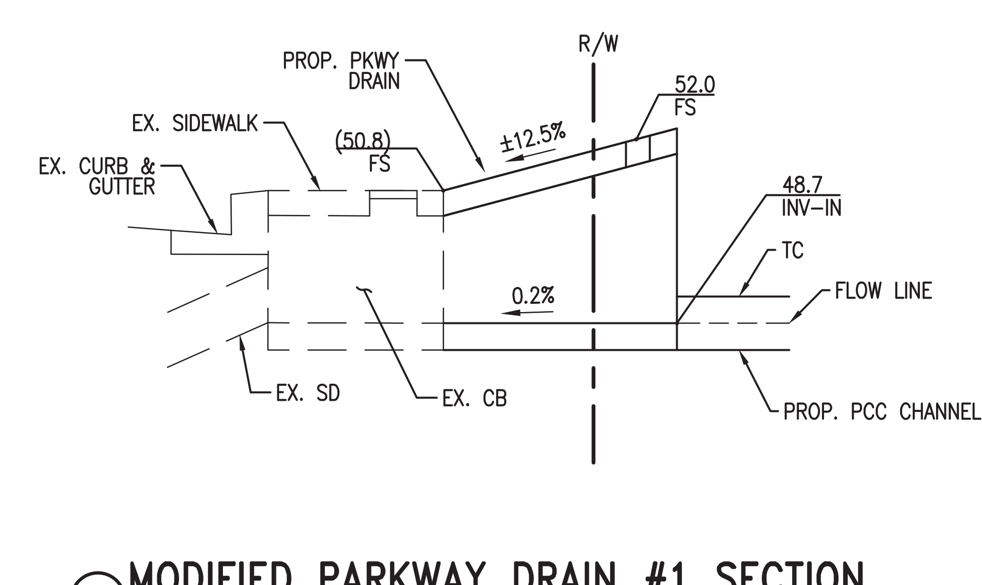
- EXISTING PAVEMENT TO BE REMOVED, SAWCUT LIMITS
- CONSTRUCT NEW PCC
- CONSTRUCT NEW A.C. PAVEMENT SECTION PER CONSTRUCTION NOTES
- INSTALL TYPE IV (R) PAVEMENT ARROW PER CALTRANS STD. A24A
- INSTALL TYPE IV (L) PAVEMENT ARROW PER CALTRANS STD. A24A
- INSTALL BIKE LANE SYMBOL WITH PERSON PAVEMENT MARKING PER CALTRANS STD. A24C

DISPOSITION NOTES:

1. PROTECT IN PLACE (ITEM NOTED ON PLAN)
2. REMOVE EXISTING PAVEMENT (SAWCUT LIMITS)
3. REMOVE EXISTING CURB & GUTTER
4. REMOVE EXISTING SIDEWALK
5. REMOVE EXISTING ITEM (ITEM NOTED ON PLAN)



DRIVEWAY DETAIL "A"
1"=10'



28 MODIFIED PARKWAY DRAIN #1 SECTION
NOT TO SCALE

CITY OF EL CENTRO
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION
ENGINEERING DEPARTMENT
1275 MAIN STREET
EL CENTRO CALIFORNIA
(760) 337-5182

DATE

APPROVED:

7/13/2020

PROJECT TITLE : EL DORADO FAMILY APARTMENTS
SHEET CONTENT : PUBLIC IMPROVEMENT PLAN
N. 8TH STREET

NO.	REVISION	DATE
1	ORIGINAL	

DESIGN BY: LB
DRAWN BY: LB
CK'ED. BY: JH
APV'ED.BY:

SHEET
C10.3
4 OF 5 SHEETS

PLAN SET: PS04
DATE: 7/9/2020

LOCATION: **IMP RTE 86 @ BRADSHAW AVENUE**

CALTRANS C8 Version 3 11/22/2016

F PAGE

	INTERVAL	PHASE TIMING									PRE-EMPTION		F									
		1	2	3	4	5	6	7	8	9	E		FLAGS	1	2	3	4	5	6	7	8	
0	WALK	**1**	**7**	**1**	**1**	**1**	**7**	**1**	**7**	CLK RST	EV SEL	**0**	PERMIT	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0
1	DONT WALK	**1**	**22**	**1**	**1**	**1**	**27**	**1**	**35**		RR1 CLR	**15**	RED LOCK	**1**		**3**		**5**		**7**		1
2	MIN GREEN	**5**	**10**	**5**	**5**	**5**	**10**	**5**	**5**		EVA DLY	**0**	YEL LOCK									2
3	TYPE 3 DET	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		EVA CLR	**5**	V RECALL		**2**				**6**			3
4	ADD/VEH	**0.0**	**2.0**	**0.0**	**0.0**	**0.0**	**2.0**	**0.0**	**0.0**		EVB DLY	**0**	P RECALL									4
5	PASSAGE	**2.0**	**7.0**	**2.0**	**3.0**	**2.0**	**7.0**	**2.0**	**3.0**		EVB CLR	**5**	PED PHASES		**2**				**6**		**8**	5
6	MAX GAP	**2.0**	**9.0**	**2.0**	**3.0**	**2.0**	**9.0**	**2.0**	**3.0**		EVC DLY	**0**	RT OLA									6
7	MIN GAP	**2.0**	**3.0**	**2.0**	**3.0**	**2.0**	**3.0**	**2.0**	**3.0**		EVC CLR	**5**	RT OLB									7
8	MAX EXT	**30**	**40**	**20**	**25**	**20**	**40**	**25**	**25**		EVD DLY	**0**	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	**5**	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	**255**	LAG PHASES	**READ ONLY**								A
B										DAY	RR2 CLR	**15**	RED REST									B
C	REDUCE BY	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	DOW			REST-IN-WALK									C
D	EVERY	**1.0**	**0.6**	**1.0**	**1.0**	**1.0**	**0.6**	**1.0**	**1.0**	HR			MAX 3 PHASES									D
E	YELLOW	**3.7**	**5.5**	**3.7**	**4.1**	**3.7**	**5.5**	**3.7**	**4.4**	MIN			YEL START UP		**2**				**6**			E
F	RED	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	SEC			FIRST PHASE			**3**				**7**		F
3.5'	PED XING FT		78				96		125					1	2	3	4	5	6	7	8	
	BIKE XING FT																					

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	**30**
FOF	**5**

FCO	**3**
FC1	**3**
FC2	**10**
FCA	**0.0**
FCB	**0.0**
FCC	**0.0**
FCD	**0.0**

FDO TB SELECT	**1**
FD3 PED SELECT	**0**
FD4 7 WIRE	**0**
FD5 PERMISSIVE	**0**
FD8 OS SEEKING	**1**

CO5 FLASH TYPE	**1**
CC2 DOWNLOAD	**1**

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

Cycle Length in "Free" 165 seconds								
Phases	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Phase Total Green Time	35	50	25	30	25	50	30	30
Phase Yellow/Red	5.7	7.5	5.7	6.1	5.7	7.5	5.7	6.4
Total Phase Time	40.7	57.5	30.7	36.1	30.7	57.5	35.7	36.4
% of cycle	25%	35%	19%	22%	19%	35%	22%	22%

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	**100**	**120**	**130**												LAG FZ FREE		**2**		**4**		**6**		**8**	0
1	FZ1 GRN FCTR	**20**	**30**	**35**										GAPOUT CP1	**1**	LAG FZ CP 1	**1**			**4**		**6**		**8**	1
2														GAPOUT CP2	**1**	LAG FZ CP 2	**1**			**4**		**6**		**8**	2
3	FZ3 GRN FCTR	**15**	**15**	**15**										GAPOUT CP3	**1**	LAG FZ CP 3	**1**			**4**		**6**		**8**	3
4	FZ4 GRN FCTR	**20**	**20**	**20**							PERM TIME			GAPOUT CP4	**1**	LAG FZ CP 4									4
5	FZ5 GRN FCTR	**15**	**15**	**15**							LAG OFFSET			GAPOUT CP5	**1**	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	**1**	LAG FZ CP 6									6
7	FZ7 GRN FCTR	**15**	**15**	**15**							LONG GRN			GAPOUT CP7	**1**	LAG FZ CP 7									7
8	FZ8 GRN FCTR	**20**	**20**	**20**							NO GREEN			GAPOUT CP8	**1**	LAG FZ CP 8									8
9	MULTI CYCLE	**0**	**0**	**0**										GAPOUT CP9	**1**	LAG FZ CP 9									9
A	OFFSET A	**0**	**100**	**100**							OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		**2**				**6**			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8	*lcl*	

LOCATION	OFF	ON
1	*1*	**1**
2	*2*	
3	*4*	
4	*8*	**8**
5	*16*	
6	*32*	
7		
8		

COO = **9**

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1	1								CP 1								
2	CP 2									CP 2	1								CP 2								
3	CP 3									CP 3	1								CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E
MINUTE = D-B-E
DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F
MINUTE = D-B-F
DAY = D-C-F

D-E-E = C8 VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

LOCATION: **IMP RTE 86 @ BRADSHAW AVENUE**

CALTRANS C8 Version 3 11/22/2016

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	**07**	**45**	**2**	**A**		**2**	**3**	**4**	**5**	**6**	
1	**08**	**30**	**3**	**A**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	**18**	**30**	**E**		**1**	**2**	**3**	**4**	**5**	**6**	**7**
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

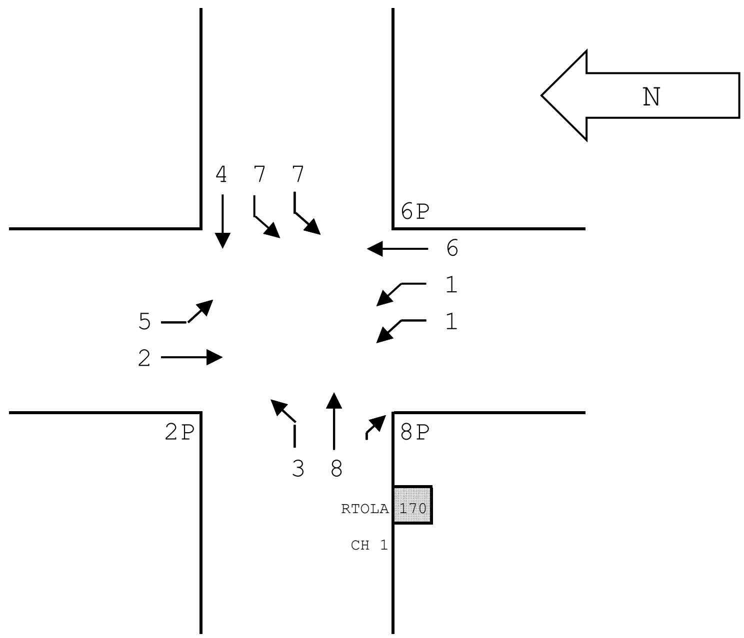
8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

11/22/2016

LOCATION: IMP RTE 86 @ BRADSHAW AVENUE

CONFLICT MONITOR PROGRAM



LOCATION: **IMP RTE 86 @ CRUICKSHANK DRIVE**

CALTRANS C8 Version 3 7/29/2019 PAGE 1

F PAGE

	INTERVAL	PHASE TIMING									PRE-EMPTION		F									
		1	2	3	4	5	6	7	8	9	E		FLAGS	1	2	3	4	5	6	7	8	
0	WALK	**1**	**7**	**1**	**1**	**1**	**7**	**1**	**7**	CLK RST	EV SEL	**0**	PERMIT	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	0
1	DONT WALK	**1**	**25**	**1**	**1**	**1**	**25**	**1**	**39**		RR1 CLR	**15**	RED LOCK	**1**		**3**		**5**		**7**		1
2	MIN GREEN	**5**	**10**	**5**	**5**	**5**	**10**	**5**	**5**		EVA DLY	**0**	YEL LOCK									2
3	TYPE 3 DET	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**		EVA CLR	**5**	V RECALL		**2**				**6**			3
4	ADD/VEH	**0.0**	**2.0**	**0.0**	**0.0**	**0.0**	**2.0**	**0.0**	**0.0**		EVB DLY	**0**	P RECALL									4
5	PASSAGE	**2.0**	**7.0**	**3.0**	**3.0**	**3.0**	**7.0**	**3.0**	**3.0**		EVB CLR	**5**	PED PHASES		**2**				**6**		**8**	5
6	MAX GAP	**2.0**	**9.0**	**3.0**	**3.0**	**3.0**	**9.0**	**3.0**	**3.0**		EVC DLY	**0**	RT OLA									6
7	MIN GAP	**2.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**	**3.0**		EVC CLR	**5**	RT OLB									7
8	MAX EXT	**30**	**50**	**15**	**25**	**25**	**50**	**20**	**25**		EVD DLY	**0**	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	**5**	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	**255**	LAG PHASES	**READ ONLY**								A
B										DAY	RR2 CLR	**15**	RED REST									B
C	REDUCE BY	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	DOW			REST-IN-WALK									C
D	EVERY	**1.0**	**0.6**	**1.0**	**1.0**	**1.0**	**0.6**	**1.0**	**1.0**	HR			MAX 3 PHASES									D
E	YELLOW	**3.7**	**5.5**	**3.7**	**4.1**	**3.7**	**5.5**	**3.7**	**4.4**	MIN			YEL START UP		**2**				**6**			E
F	RED	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	SEC			FIRST PHASE			**3**				**7**		F
3.5'	PED XING FT		89				88		135					1	2	3	4	5	6	7	8	
	BIKE XING FT																					

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	**30**
FOF	**5**

FCO	**3**
FC1	**3**
FC2	**10**
FCA	**0.0**
FCB	**0.0**
FCC	**0.0**
FCD	**0.0**

FDO TB SELECT	**1**
FD3 PED SELECT	**0**
FD4 7 WIRE	**0**
FD5 PERMISSIVE	**0**
FD8 OS SEEKING	**1**

CO5 FLASH TYPE	**1**
CC2 DOWNLOAD	**1**

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: **IMP RTE 86 @ CRUICKSHANK DRIVE**

CALTRANS C8 Version 3 11/22/2016

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE		FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E		F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH	**100**	**120**	**130**												LAG FZ FREE		**2**		**4**		**6**		**8**	0
1	FZ1 GRN FCTR	**20**	**30**	**35**										GAPOUT CP1	**1**	LAG FZ CP 1	**1**			**4**		**6**		**8**	1
2														GAPOUT CP2	**1**	LAG FZ CP 2	**1**			**4**		**6**		**8**	2
3	FZ3 GRN FCTR	**15**	**15**	**15**										GAPOUT CP3	**1**	LAG FZ CP 3	**1**			**4**		**6**		**8**	3
4	FZ4 GRN FCTR	**20**	**20**	**20**							PERM TIME			GAPOUT CP4	**1**	LAG FZ CP 4									4
5	FZ5 GRN FCTR	**15**	**15**	**15**							LAG OFFSET			GAPOUT CP5	**1**	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	**1**	LAG FZ CP 6									6
7	FZ7 GRN FCTR	**15**	**15**	**15**							LONG GRN			GAPOUT CP7	**1**	LAG FZ CP 7									7
8	FZ8 GRN FCTR	**20**	**20**	**20**							NO GREEN			GAPOUT CP8	**1**	LAG FZ CP 8									8
9	MULTI CYCLE	**0**	**0**	**0**										GAPOUT CP9	**1**	LAG FZ CP 9									9
A	OFFSET A	**15**	**115**	**115**							OFFSET					LAG C COORD									A
B	OFFSET B															LAG D COORD									B
C	OFFSET C															COORD FAZES		**2**				**6**			C
D	FZ 3 EXT																								D
E	FZ 7 EXT																								E
F	OFFSET INTRPT																								F
																	1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8	*lcl*	

LOCATION	OFF	ON
1	*1*	
2	*2*	**2**
3	*4*	
4	*8*	**8**
5	*16*	
6	*32*	
7		
8		

COO = **10**

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1	**1**								CP 1								
2	CP 2									CP 2	**1**								CP 2								
3	CP 3									CP 3	**1**								CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		**2**							5
6										6 PED						**6**			6
7										4 PED				**4**					7
8										8 PED								**8**	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
	HR	MIN	ACT	ON/ OFF	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	**11**	**00**	**E**	**ON**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	**13**	**00**	**E**		**1**	**2**	**3**	**4**	**5**	**6**	**7**
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0	**07**	**45**	**2**	**A**		**2**	**3**	**4**	**5**	**6**	
1	**08**	**30**	**3**	**A**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2	**18**	**30**	**E**		**1**	**2**	**3**	**4**	**5**	**6**	**7**
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE CO9 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
	HR	MIN	CP	OS	S 1	M 2	T 3	W 4	T 5	F 6	S 7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

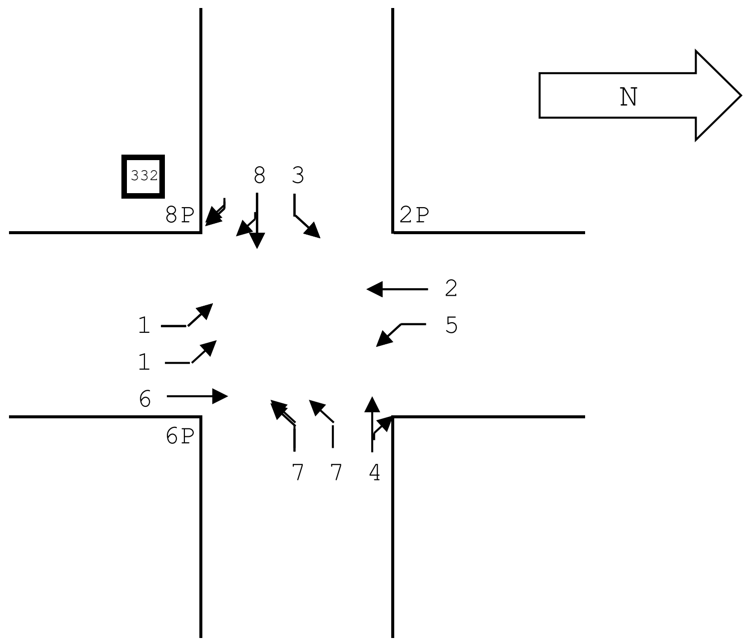
8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

11/22/2016

LOCATION: IMP RTE 86 @ CRUICKSHANK DRIVE

CONFLICT MONITOR PROGRAM



Appendix D: Existing Conditions HCM Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	82	98	25	75	76	146	492	46	122	858	197
Future Volume (veh/h)	101	82	98	25	75	76	146	492	46	122	858	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	102	98	27	82	83	159	535	50	133	933	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	135	717	608	85	283	287	210	1037	463	159	1138	508
Arrive On Green	0.08	0.38	0.38	0.02	0.33	0.33	0.06	0.29	0.29	0.09	0.32	0.32
Sat Flow, veh/h	1781	1870	1585	3456	852	863	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	110	102	98	27	0	165	159	535	50	133	933	214
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1715	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.3	4.3	4.9	0.9	0.0	8.5	5.4	15.1	2.8	8.8	29.0	12.7
Cycle Q Clear(g_c), s	7.3	4.3	4.9	0.9	0.0	8.5	5.4	15.1	2.8	8.8	29.0	12.7
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	135	717	608	85	0	570	210	1037	463	159	1138	508
V/C Ratio(X)	0.81	0.14	0.16	0.32	0.00	0.29	0.76	0.52	0.11	0.84	0.82	0.42
Avail Cap(c_a), veh/h	223	717	608	144	0	570	210	1037	463	168	1138	508
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.86	0.86	0.86	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	24.1	24.3	57.5	0.0	29.6	55.5	35.4	31.1	53.8	37.6	32.0
Incr Delay (d2), s/veh	4.4	0.4	0.6	2.1	0.0	0.3	11.4	1.6	0.4	28.3	6.6	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	2.0	1.9	0.4	0.0	3.6	2.6	6.5	1.1	5.1	13.1	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.0	24.5	24.9	59.6	0.0	29.9	66.9	37.0	31.5	82.1	44.2	34.6
LnGrp LOS	E	C	C	E	A	C	E	D	C	F	D	C
Approach Vol, veh/h		310			192			744			1280	
Approach Delay, s/veh		36.9			34.1			43.0			46.6	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	45.9	14.8	46.3	16.4	42.5	8.7	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 7.3	36.4	* 15	* 36	* 11	32.4	* 5	46.0
Max Q Clear Time (g_c+I1), s	7.4	31.0	9.3	10.5	10.8	17.1	2.9	6.9
Green Ext Time (p_c), s	0.0	4.7	0.1	0.9	0.0	7.4	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	43.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	136	177	0	0	1
Future Vol, veh/h	0	136	177	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	148	192	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	192	0	-	0	266	96
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	74	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1379	-	-	-	701	942
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1379	-	-	-	701	942
Mov Cap-2 Maneuver	-	-	-	-	701	-
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1379	-	-	-	942
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	-	-	-	8.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	133	6	3	168	9	7
Future Vol, veh/h	133	6	3	168	9	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	145	7	3	183	10	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	152	0	247	76
Stage 1	-	-	-	-	149	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1426	-	720	970
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	915	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1426	-	719	970
Mov Cap-2 Maneuver	-	-	-	-	719	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	913	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	811	-	-	1426	-
HCM Lane V/C Ratio	0.021	-	-	0.002	-
HCM Control Delay (s)	9.5	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	69	108	260	310	62
Future Volume (veh/h)	72	69	108	260	310	62
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	75	117	283	337	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	339	155	150	2507	1626	320
Arrive On Green	0.10	0.10	0.08	0.71	0.55	0.55
Sat Flow, veh/h	3456	1585	1781	3647	3054	582
Grp Volume(v), veh/h	78	75	117	283	201	203
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1766
Q Serve(g_s), s	1.2	2.5	3.6	1.4	3.2	3.3
Cycle Q Clear(g_c), s	1.2	2.5	3.6	1.4	3.2	3.3
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	339	155	150	2507	976	970
V/C Ratio(X)	0.23	0.48	0.78	0.11	0.21	0.21
Avail Cap(c_a), veh/h	1870	858	193	2507	976	970
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	23.7	24.9	2.6	6.3	6.4
Incr Delay (d2), s/veh	0.5	3.3	10.8	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	1.8	0.3	1.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.6	27.0	35.7	2.7	6.8	6.9
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	153			400	404	
Approach Delay, s/veh	25.2			12.3	6.8	
Approach LOS	C			B	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		10.9	8.7	35.8
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		3.4		4.5	5.6	5.3
Green Ext Time (p_c), s		3.6		0.7	0.0	4.4
Intersection Summary						
HCM 6th Ctrl Delay			12.1			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	49	119	73	47	31	114	614	60	22	902	58
Future Volume (veh/h)	48	49	119	73	47	31	114	614	60	22	902	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	53	129	79	51	34	124	667	65	24	980	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	67	655	555	134	367	245	177	1342	598	41	1241	554
Arrive On Green	0.04	0.35	0.35	0.04	0.35	0.35	0.05	0.38	0.38	0.05	0.70	0.70
Sat Flow, veh/h	1781	1870	1585	3456	1047	698	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	52	53	129	79	0	85	124	667	65	24	980	63
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1745	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.5	2.3	6.9	2.7	0.0	4.0	4.2	17.3	3.2	1.6	22.2	1.6
Cycle Q Clear(g_c), s	3.5	2.3	6.9	2.7	0.0	4.0	4.2	17.3	3.2	1.6	22.2	1.6
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	67	655	555	134	0	612	177	1342	598	41	1241	554
V/C Ratio(X)	0.78	0.08	0.23	0.59	0.00	0.14	0.70	0.50	0.11	0.59	0.79	0.11
Avail Cap(c_a), veh/h	135	655	555	144	0	612	190	1342	598	74	1241	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	57.2	26.1	27.6	56.7	0.0	26.6	56.0	28.6	24.2	56.7	15.1	12.0
Incr Delay (d2), s/veh	7.0	0.2	1.0	3.2	0.0	0.1	8.1	1.3	0.4	2.6	2.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.1	2.8	1.2	0.0	1.7	2.0	7.3	1.3	0.7	5.2	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	26.3	28.6	60.0	0.0	26.7	64.1	29.9	24.6	59.3	17.9	12.2
LnGrp LOS	E	C	C	E	A	C	E	C	C	E	B	B
Approach Vol, veh/h		234			164			856			1067	
Approach Delay, s/veh		36.0			42.7			34.5			18.5	
Approach LOS		D			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.8	49.4	10.2	48.5	8.5	52.8	10.3	48.4				
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4				
Max Green Setting (Gmax), s	* 6.6	41.1	* 9.1	* 38	* 5	42.7	* 5	42.0				
Max Q Clear Time (g_c+I1), s	6.2	24.2	5.5	6.0	3.6	19.3	4.7	8.9				
Green Ext Time (p_c), s	0.0	12.8	0.0	0.5	0.0	12.1	0.0	0.7				
Intersection Summary												
HCM 6th Ctrl Delay			27.9									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	80	1	5	87	15	1
Future Vol, veh/h	80	1	5	87	15	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	1	5	95	16	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	88	0	193	88
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	105	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1508	-	796	970
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	919	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1508	-	794	970
Mov Cap-2 Maneuver	-	-	-	-	794	-
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	803	-	-	1508	-
HCM Lane V/C Ratio	0.022	-	-	0.004	-
HCM Control Delay (s)	9.6	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	65	62	8	10	29
Future Vol, veh/h	18	65	62	8	10	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	71	67	9	11	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	76	0	-	0	183	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	111	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1523	-	-	-	806	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	914	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1523	-	-	-	795	990
Mov Cap-2 Maneuver	-	-	-	-	795	-
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	914	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1523	-	-	-	931
HCM Lane V/C Ratio	0.013	-	-	-	0.046
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	49	50	385	370	14
Future Vol, veh/h	10	49	50	385	370	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	53	54	418	402	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	727	410	417	0	-	0
Stage 1	410	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	375	641	1140	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	357	641	1140	-	-	-
Mov Cap-2 Maneuver	469	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	712	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1140	-	469	641	-	-
HCM Lane V/C Ratio	0.048	-	0.023	0.083	-	-
HCM Control Delay (s)	8.3	-	12.9	11.1	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	38	0	0	0	25	0	0	0	0	9
Future Vol, veh/h	16	0	38	0	0	0	25	0	0	0	0	9
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	0	41	0	0	0	27	0	0	0	0	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	59	59	5	80	64	0	10	0	0	0	0	0
Stage 1	5	5	-	54	54	-	-	-	-	-	-	-
Stage 2	54	54	-	26	10	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	937	832	1078	908	827	-	1610	-	-	-	-	-
Stage 1	1017	892	-	958	850	-	-	-	-	-	-	-
Stage 2	958	850	-	992	887	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	818	1078	862	813	-	1610	-	-	-	-	-
Mov Cap-2 Maneuver	-	818	-	862	813	-	-	-	-	-	-	-
Stage 1	1000	892	-	942	836	-	-	-	-	-	-	-
Stage 2	942	836	-	954	887	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		0	7.3	0
HCM LOS	-	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.017	-	-	-	-	-	-	-
HCM Control Delay (s)	7.3	0	-	-	0	0	-	-
HCM Lane LOS	A	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	395	2	2	379
Future Vol, veh/h	7	6	395	2	2	379
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	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	429	2	2	412

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	640	216	0	0	431	0
Stage 1	430	-	-	-	-	-
Stage 2	210	-	-	-	-	-
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	408	789	-	-	1125	-
Stage 1	624	-	-	-	-	-
Stage 2	805	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	407	789	-	-	1125	-
Mov Cap-2 Maneuver	499	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	11.1		0		0	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	499	789	1125	-
HCM Lane V/C Ratio	-	-	0.015	0.008	0.002	-
HCM Control Delay (s)	-	-	12.3	9.6	8.2	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	204	251	22	161	106	327	623	65	129	670	237
Future Volume (veh/h)	267	204	251	22	161	106	327	623	65	129	670	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	290	260	248	24	175	115	355	677	71	140	728	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	717	608	79	240	158	325	1050	468	156	1026	458
Arrive On Green	0.18	0.38	0.38	0.02	0.23	0.23	0.09	0.30	0.30	0.09	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	3456	1053	692	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	290	260	248	24	0	290	355	677	71	140	728	258
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1746	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	19.2	11.9	13.7	0.8	0.0	18.4	11.3	19.9	4.0	9.3	22.0	16.6
Cycle Q Clear(g_c), s	19.2	11.9	13.7	0.8	0.0	18.4	11.3	19.9	4.0	9.3	22.0	16.6
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	317	717	608	79	0	398	325	1050	468	156	1026	458
V/C Ratio(X)	0.91	0.36	0.41	0.30	0.00	0.73	1.09	0.64	0.15	0.90	0.71	0.56
Avail Cap(c_a), veh/h	373	717	608	144	0	398	325	1050	468	156	1026	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.42	0.42	0.42	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	26.5	27.0	57.7	0.0	42.9	54.3	36.8	31.2	54.2	38.2	36.3
Incr Delay (d2), s/veh	22.6	1.4	2.0	2.1	0.0	6.6	59.9	1.3	0.3	43.8	4.2	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	5.6	5.5	0.4	0.0	8.7	7.5	8.5	1.6	6.0	9.8	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.1	27.9	29.1	59.8	0.0	49.4	114.3	38.1	31.5	98.0	42.3	41.2
LnGrp LOS	E	C	C	E	A	D	F	D	C	F	D	D
Approach Vol, veh/h		798			314			1103			1126	
Approach Delay, s/veh		44.0			50.2			62.2			49.0	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	42.1	27.1	33.8	16.2	42.9	8.5	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 11	32.4	* 25	* 26	* 11	33.2	* 5	46.0
Max Q Clear Time (g_c+I1), s	13.3	24.0	21.2	20.4	11.3	21.9	2.8	15.7
Green Ext Time (p_c), s	0.0	6.5	0.2	0.8	0.0	7.2	0.0	2.5

Intersection Summary	
HCM 6th Ctrl Delay	52.3
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	282	204	0	0	1
Future Vol, veh/h	1	282	204	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	307	222	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	222	0	-	0	378	111
Stage 1	-	-	-	-	222	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1344	-	-	-	597	921
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	856	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1344	-	-	-	596	921
Mov Cap-2 Maneuver	-	-	-	-	596	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	856	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1344	-	-	-	921
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s)	7.7	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	263	21	10	188	16	4
Future Vol, veh/h	263	21	10	188	16	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	286	23	11	204	17	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	422	155
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	124	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1248	-	560	863
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	888	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1248	-	555	863
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	880	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	598	-	-	1248	-
HCM Lane V/C Ratio	0.036	-	-	0.009	-
HCM Control Delay (s)	11.2	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	142	126	138	318	281	60
Future Volume (veh/h)	142	126	138	318	281	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	137	150	346	305	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	486	223	184	2388	1462	307
Arrive On Green	0.14	0.14	0.10	0.67	0.50	0.50
Sat Flow, veh/h	3456	1585	1781	3647	3016	614
Grp Volume(v), veh/h	154	137	150	346	184	186
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1760
Q Serve(g_s), s	2.3	4.7	4.8	2.1	3.4	3.4
Cycle Q Clear(g_c), s	2.3	4.7	4.8	2.1	3.4	3.4
Prop In Lane	1.00	1.00	1.00			0.35
Lane Grp Cap(c), veh/h	486	223	184	2388	889	880
V/C Ratio(X)	0.32	0.61	0.82	0.14	0.21	0.21
Avail Cap(c_a), veh/h	1782	817	184	2388	889	880
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.5	23.5	25.6	3.5	8.1	8.1
Incr Delay (d2), s/veh	0.5	3.9	22.7	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	4.4	3.0	0.5	1.1	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.0	27.4	48.2	3.6	8.6	8.7
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	291			496	370	
Approach Delay, s/veh	25.1			17.1	8.7	
Approach LOS	C			B	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		13.7	10.0	34.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		4.1		6.7	6.8	5.4
Green Ext Time (p_c), s		4.5		1.5	0.0	4.0

Intersection Summary			
HCM 6th Ctrl Delay			16.4
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	106	285	119	120	109	265	850	122	40	797	107
Future Volume (veh/h)	122	106	285	119	120	109	265	850	122	40	797	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	133	115	310	129	130	118	288	924	133	43	866	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	655	555	158	276	251	343	1285	573	57	1045	466
Arrive On Green	0.09	0.35	0.35	0.05	0.31	0.31	0.10	0.36	0.36	0.06	0.59	0.59
Sat Flow, veh/h	1781	1870	1585	3456	903	820	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	133	115	310	129	0	248	288	924	133	43	866	116
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1723	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.8	5.1	19.0	4.4	0.0	14.0	9.8	26.9	7.0	2.9	23.5	4.2
Cycle Q Clear(g_c), s	8.8	5.1	19.0	4.4	0.0	14.0	9.8	26.9	7.0	2.9	23.5	4.2
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	655	555	158	0	527	343	1285	573	57	1045	466
V/C Ratio(X)	0.83	0.18	0.56	0.81	0.00	0.47	0.84	0.72	0.23	0.76	0.83	0.25
Avail Cap(c_a), veh/h	245	655	555	158	0	527	377	1285	573	74	1045	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.73	0.73	0.73
Uniform Delay (d), s/veh	53.7	27.0	31.5	56.7	0.0	33.7	53.1	33.0	26.7	55.7	22.3	18.3
Incr Delay (d2), s/veh	8.1	0.6	4.0	25.2	0.0	0.7	13.2	3.5	0.9	14.7	5.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.4	7.9	2.5	0.0	6.0	4.8	11.7	2.8	1.5	6.7	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	27.6	35.5	82.0	0.0	34.4	66.3	36.5	27.6	70.5	27.9	19.2
LnGrp LOS	E	C	D	F	A	C	E	D	C	E	C	B
Approach Vol, veh/h		558			377			1345			1025	
Approach Delay, s/veh		40.2			50.7			42.0			28.7	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	42.8	16.5	43.1	9.5	50.9	11.2	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 13	34.1	* 17	* 31	* 5	42.2	* 5.5	42.0
Max Q Clear Time (g_c+I1), s	11.8	25.5	10.8	16.0	4.9	28.9	6.4	21.0
Green Ext Time (p_c), s	0.1	6.8	0.1	1.3	0.0	10.4	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	38.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	169	5	3	143	30	3
Future Vol, veh/h	169	5	3	143	30	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	184	5	3	155	33	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	189	0	348	187
Stage 1	-	-	-	-	187	-
Stage 2	-	-	-	-	161	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1385	-	649	855
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	868	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1385	-	648	855
Mov Cap-2 Maneuver	-	-	-	-	648	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	866	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	663	-	-	1385	-
HCM Lane V/C Ratio	0.054	-	-	0.002	-
HCM Control Delay (s)	10.7	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	123	102	31	5	26
Future Vol, veh/h	67	123	102	31	5	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	73	134	111	34	5	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	145	0	-	0	408	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	280	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1437	-	-	-	599	922
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1437	-	-	-	566	922
Mov Cap-2 Maneuver	-	-	-	-	566	-
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1437	-	-	-	837
HCM Lane V/C Ratio	0.051	-	-	-	0.04
HCM Control Delay (s)	7.6	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	105	111	464	377	16
Future Vol, veh/h	17	105	111	464	377	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	114	121	504	410	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	913	419	427	0	-	0
Stage 1	419	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	288	633	1131	-	-	-
Stage 1	663	-	-	-	-	-
Stage 2	580	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	257	633	1131	-	-	-
Mov Cap-2 Maneuver	385	-	-	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	1.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1131	-	385	633	-	-
HCM Lane V/C Ratio	0.107	-	0.048	0.18	-	-
HCM Control Delay (s)	8.6	-	14.8	11.9	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.7	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	0	30	0	0	0	94	0	0	0	0	30
Future Vol, veh/h	19	0	30	0	0	0	94	0	0	0	0	30
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	0	33	0	0	0	102	0	0	0	0	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	221	221	17	237	237	0	33	0	0	0	0	0
Stage 1	17	17	-	204	204	-	-	-	-	-	-	-
Stage 2	204	204	-	33	33	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	735	678	1062	717	664	-	1579	-	-	-	-	-
Stage 1	1002	881	-	798	733	-	-	-	-	-	-	-
Stage 2	798	733	-	983	868	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	634	1062	660	621	-	1579	-	-	-	-	-
Mov Cap-2 Maneuver	-	634	-	660	621	-	-	-	-	-	-	-
Stage 1	937	881	-	746	685	-	-	-	-	-	-	-
Stage 2	746	685	-	953	868	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		0	7.4	0
HCM LOS	-	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1579	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.065	-	-	-	-	-	-	-
HCM Control Delay (s)	7.4	0	-	-	0	0	-	-
HCM Lane LOS	A	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-	-	-	-

Intersection						
Int Delay, s/veh	0.1					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	481	7	7	407
Future Vol, veh/h	4	4	481	7	7	407
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	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	523	8	8	442

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	764	266	0	0	531	0
Stage 1	527	-	-	-	-	-
Stage 2	237	-	-	-	-	-
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	340	732	-	-	1033	-
Stage 1	557	-	-	-	-	-
Stage 2	780	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	337	732	-	-	1033	-
Mov Cap-2 Maneuver	441	-	-	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	774	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	441	732	1033	-
HCM Lane V/C Ratio	-	-	0.01	0.006	0.007	-
HCM Control Delay (s)	-	-	13.2	9.9	8.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Michael Baker
INTERNATIONAL

Appendix E: Existing + Project HCM Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	83	98	35	78	79	146	495	49	123	861	197
Future Volume (veh/h)	101	83	98	35	78	79	146	495	49	123	861	197
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	110	103	98	38	85	86	159	538	53	134	936	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	136	717	608	103	287	291	215	1025	457	156	1114	497
Arrive On Green	0.08	0.38	0.38	0.03	0.34	0.34	0.06	0.29	0.29	0.09	0.31	0.31
Sat Flow, veh/h	1781	1870	1585	3456	853	863	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	110	103	98	38	0	171	159	538	53	134	936	214
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1715	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.3	4.3	4.9	1.3	0.0	8.8	5.4	15.2	3.0	8.9	29.5	12.9
Cycle Q Clear(g_c), s	7.3	4.3	4.9	1.3	0.0	8.8	5.4	15.2	3.0	8.9	29.5	12.9
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	136	717	608	103	0	578	215	1025	457	156	1114	497
V/C Ratio(X)	0.81	0.14	0.16	0.37	0.00	0.30	0.74	0.52	0.12	0.86	0.84	0.43
Avail Cap(c_a), veh/h	373	717	608	144	0	578	325	1025	457	156	1114	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	24.1	24.3	57.1	0.0	29.3	55.3	35.8	31.4	54.0	38.4	32.7
Incr Delay (d2), s/veh	4.3	0.4	0.6	2.2	0.0	0.3	1.6	1.6	0.4	35.4	7.7	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	2.0	1.9	0.6	0.0	3.7	2.4	6.6	1.2	5.4	13.4	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.8	24.6	24.9	59.3	0.0	29.6	56.9	37.4	31.9	89.4	46.0	35.4
LnGrp LOS	E	C	C	E	A	C	E	D	C	F	D	D
Approach Vol, veh/h		311			209			750			1284	
Approach Delay, s/veh		36.8			35.0			41.2			48.8	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	45.1	14.9	46.8	16.2	42.1	9.3	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 11	32.4	* 25	* 26	* 11	33.2	* 5	46.0
Max Q Clear Time (g_c+I1), s	7.4	31.5	9.3	10.8	10.9	17.2	3.3	6.9
Green Ext Time (p_c), s	0.1	0.9	0.1	0.8	0.0	7.7	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	44.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	141	194	0	0	1
Future Vol, veh/h	0	141	194	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	153	211	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	211	0	-	0	288	106
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1357	-	-	-	679	928
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1357	-	-	-	679	928
Mov Cap-2 Maneuver	-	-	-	-	679	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	937	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1357	-	-	-	928
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	136	8	3	178	17	10
Future Vol, veh/h	136	8	3	178	17	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	148	9	3	193	18	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	157	0	256	79
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	103	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1420	-	711	965
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	910	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1420	-	710	965
Mov Cap-2 Maneuver	-	-	-	-	710	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	908	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	787	-	-	1420	-
HCM Lane V/C Ratio	0.037	-	-	0.002	-
HCM Control Delay (s)	9.8	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	72	118	263	311	63
Future Volume (veh/h)	75	72	118	263	311	63
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	78	128	286	338	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	342	157	163	2504	1598	318
Arrive On Green	0.10	0.10	0.09	0.70	0.54	0.54
Sat Flow, veh/h	3456	1585	1781	3647	3048	587
Grp Volume(v), veh/h	82	78	128	286	202	204
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1765
Q Serve(g_s), s	1.2	2.6	3.9	1.4	3.3	3.3
Cycle Q Clear(g_c), s	1.2	2.6	3.9	1.4	3.3	3.3
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	342	157	163	2504	961	955
V/C Ratio(X)	0.24	0.50	0.78	0.11	0.21	0.21
Avail Cap(c_a), veh/h	1868	857	193	2504	961	955
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	23.7	24.7	2.6	6.6	6.6
Incr Delay (d2), s/veh	0.5	3.4	13.5	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.4	2.1	0.3	1.0	1.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.6	27.1	38.2	2.7	7.1	7.1
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	160			414	406	
Approach Delay, s/veh	25.3			13.7	7.1	
Approach LOS	C			B	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		11.0	9.1	35.4
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		3.4		4.6	5.9	5.3
Green Ext Time (p_c), s		3.6		0.8	0.0	4.4

Intersection Summary			
HCM 6th Ctrl Delay			12.9
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	50	119	86	50	34	114	617	64	23	912	58
Future Volume (veh/h)	48	50	119	86	50	34	114	617	64	23	912	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	52	54	129	93	54	37	124	671	70	25	991	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	67	655	555	143	366	251	177	1330	593	42	1232	550
Arrive On Green	0.04	0.35	0.35	0.04	0.35	0.35	0.05	0.37	0.37	0.05	0.69	0.69
Sat Flow, veh/h	1781	1870	1585	3456	1034	709	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	52	54	129	93	0	91	124	671	70	25	991	63
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1743	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.5	2.3	6.9	3.2	0.0	4.3	4.2	17.5	3.5	1.7	23.2	1.6
Cycle Q Clear(g_c), s	3.5	2.3	6.9	3.2	0.0	4.3	4.2	17.5	3.5	1.7	23.2	1.6
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	67	655	555	143	0	616	177	1330	593	42	1232	550
V/C Ratio(X)	0.78	0.08	0.23	0.65	0.00	0.15	0.70	0.50	0.12	0.60	0.80	0.11
Avail Cap(c_a), veh/h	135	655	555	153	0	616	190	1330	593	74	1232	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	57.2	26.1	27.6	56.7	0.0	26.4	56.0	29.0	24.6	56.6	15.6	12.3
Incr Delay (d2), s/veh	7.0	0.2	1.0	6.4	0.0	0.1	8.1	1.4	0.4	2.2	2.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.1	2.8	1.5	0.0	1.8	2.0	7.4	1.4	0.7	5.3	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	26.4	28.6	63.1	0.0	26.6	64.1	30.3	25.0	58.8	18.1	12.4
LnGrp LOS	E	C	C	E	A	C	E	C	C	E	B	B
Approach Vol, veh/h		235			184			865			1079	
Approach Delay, s/veh		36.0			45.0			34.7			18.7	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	49.1	10.2	48.8	8.5	52.4	10.6	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 6.6	40.8	* 9.1	* 39	* 5	42.4	* 5.3	42.0
Max Q Clear Time (g_c+I1), s	6.2	25.2	5.5	6.3	3.7	19.5	5.2	8.9
Green Ext Time (p_c), s	0.0	12.0	0.0	0.5	0.0	12.1	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	86	1	6	108	15	1
Future Vol, veh/h	86	1	6	108	15	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	93	1	7	117	16	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	94	0	225	94
Stage 1	-	-	-	-	94	-
Stage 2	-	-	-	-	131	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1500	-	763	963
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	895	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1500	-	759	963
Mov Cap-2 Maneuver	-	-	-	-	759	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	891	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	769	-	-	1500	-
HCM Lane V/C Ratio	0.023	-	-	0.004	-
HCM Control Delay (s)	9.8	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	2.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	69	75	10	18	39
Future Vol, veh/h	21	69	75	10	18	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	75	82	11	20	42

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	209	88
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1501	-	-	-	779	970
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	904	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1501	-	-	-	767	970
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	920	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1501	-	-	-	895
HCM Lane V/C Ratio	0.015	-	-	-	0.069
HCM Control Delay (s)	7.4	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	1.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	57	52	388	380	27
Future Vol, veh/h	14	57	52	388	380	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	62	57	422	413	29

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	753	428	442	0	-	0
Stage 1	428	-	-	-	-	-
Stage 2	325	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	361	626	1116	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	705	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	343	626	1116	-	-	-
Mov Cap-2 Maneuver	457	-	-	-	-	-
Stage 1	623	-	-	-	-	-
Stage 2	705	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1116	-	457	626	-	-
HCM Lane V/C Ratio	0.051	-	0.033	0.099	-	-
HCM Control Delay (s)	8.4	-	13.1	11.4	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	38	18	0	11	25	0	5	3	0	9
Future Vol, veh/h	16	0	38	18	0	11	25	0	5	3	0	9
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	0	41	20	0	12	27	0	5	3	0	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	74	70	5	89	73	3	10	0	0	5	0	0
Stage 1	11	11	-	57	57	-	-	-	-	-	-	-
Stage 2	63	59	-	32	16	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	916	821	1078	896	817	1081	1610	-	-	1616	-	-
Stage 1	1010	886	-	955	847	-	-	-	-	-	-	-
Stage 2	948	846	-	984	882	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	893	805	1078	849	801	1081	1610	-	-	1616	-	-
Mov Cap-2 Maneuver	893	805	-	849	801	-	-	-	-	-	-	-
Stage 1	993	884	-	939	833	-	-	-	-	-	-	-
Stage 2	922	832	-	944	880	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	9	6.1	1.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	1016	924	1616	-	-
HCM Lane V/C Ratio	0.017	-	-	0.058	0.034	0.002	-	-
HCM Control Delay (s)	7.3	0	-	8.8	9	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	22	7	0	6	7	395	2	2	379	4
Future Vol, veh/h	13	0	22	7	0	6	7	395	2	2	379	4
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	-	-	-	0	-	0	100	-	-	100	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	0	24	8	0	7	8	429	2	2	412	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	647	863	206	656	-	216	416	0	0	431	0	0
Stage 1	416	416	-	446	-	-	-	-	-	-	-	-
Stage 2	231	447	-	210	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	356	291	800	351	0	789	1139	-	-	1125	-	-
Stage 1	585	590	-	561	0	-	-	-	-	-	-	-
Stage 2	751	572	-	773	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	351	288	800	338	-	789	1139	-	-	1125	-	-
Mov Cap-2 Maneuver	351	288	-	338	-	-	-	-	-	-	-	-
Stage 1	581	589	-	557	-	-	-	-	-	-	-	-
Stage 2	740	568	-	749	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	13	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1139	-	-	542	338	789	1125	-	-
HCM Lane V/C Ratio	0.007	-	-	0.07	0.023	0.008	0.002	-	-
HCM Control Delay (s)	8.2	-	-	12.1	15.9	9.6	8.2	-	-
HCM Lane LOS	A	-	-	B	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	207	251	28	163	108	327	625	74	132	679	237
Future Volume (veh/h)	267	207	251	28	163	108	327	625	74	132	679	237
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	290	261	249	30	177	117	355	679	80	143	738	258
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	717	608	91	243	161	325	1038	463	156	1014	452
Arrive On Green	0.18	0.38	0.38	0.03	0.23	0.23	0.09	0.29	0.29	0.09	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	3456	1051	695	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	290	261	249	30	0	294	355	679	80	143	738	258
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1745	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	19.2	12.0	13.8	1.0	0.0	18.7	11.3	20.1	4.5	9.6	22.5	16.7
Cycle Q Clear(g_c), s	19.2	12.0	13.8	1.0	0.0	18.7	11.3	20.1	4.5	9.6	22.5	16.7
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	317	717	608	91	0	404	325	1038	463	156	1014	452
V/C Ratio(X)	0.91	0.36	0.41	0.33	0.00	0.73	1.09	0.65	0.17	0.92	0.73	0.57
Avail Cap(c_a), veh/h	373	717	608	144	0	404	325	1038	463	156	1014	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.41	0.41	0.41	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	26.5	27.1	57.4	0.0	42.6	54.3	37.2	31.7	54.3	38.7	36.6
Incr Delay (d2), s/veh	22.6	1.4	2.0	2.1	0.0	6.4	59.6	1.3	0.3	48.5	4.6	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	5.6	5.6	0.5	0.0	8.8	7.5	8.6	1.8	6.3	10.1	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.1	27.9	29.1	59.5	0.0	49.0	113.9	38.5	32.0	102.8	43.3	41.8
LnGrp LOS	E	C	C	E	A	D	F	D	C	F	D	D
Approach Vol, veh/h		800			324			1114			1139	
Approach Delay, s/veh		43.9			50.0			62.1			50.4	
Approach LOS		D			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	41.7	27.1	34.2	16.2	42.5	8.9	52.4				
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4				
Max Green Setting (Gmax), s	* 11	32.4	* 25	* 26	* 11	33.2	* 5	46.0				
Max Q Clear Time (g_c+I1), s	13.3	24.5	21.2	20.7	11.6	22.1	3.0	15.8				
Green Ext Time (p_c), s	0.0	6.2	0.2	0.8	0.0	7.2	0.0	2.5				
Intersection Summary												
HCM 6th Ctrl Delay			52.7									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	299	214	0	0	1
Future Vol, veh/h	1	299	214	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	325	233	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	233	0	-	0	398	117
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	165	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1332	-	-	-	580	913
Stage 1	-	-	-	-	784	-
Stage 2	-	-	-	-	847	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1332	-	-	-	579	913
Mov Cap-2 Maneuver	-	-	-	-	579	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	847	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1332	-	-	-	913
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s)	7.7	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑↑	Y	
Traffic Vol, veh/h	272	29	10	194	20	6
Future Vol, veh/h	272	29	10	194	20	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	296	32	11	211	22	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	328	0	440	164
Stage 1	-	-	-	-	312	-
Stage 2	-	-	-	-	128	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1228	-	545	852
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	884	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1228	-	540	852
Mov Cap-2 Maneuver	-	-	-	-	540	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	876	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	590	-	-	1228	-
HCM Lane V/C Ratio	0.048	-	-	0.009	-
HCM Control Delay (s)	11.4	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	144	135	144	320	284	63
Future Volume (veh/h)	144	135	144	320	284	63
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	147	157	348	309	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	509	234	182	2369	1441	313
Arrive On Green	0.15	0.15	0.10	0.67	0.50	0.50
Sat Flow, veh/h	3456	1585	1781	3647	2997	630
Grp Volume(v), veh/h	157	147	157	348	187	190
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1757
Q Serve(g_s), s	2.4	5.1	5.1	2.1	3.5	3.6
Cycle Q Clear(g_c), s	2.4	5.1	5.1	2.1	3.5	3.6
Prop In Lane	1.00	1.00	1.00			0.36
Lane Grp Cap(c), veh/h	509	234	182	2369	882	872
V/C Ratio(X)	0.31	0.63	0.86	0.15	0.21	0.22
Avail Cap(c_a), veh/h	1768	811	182	2369	882	872
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	23.5	25.9	3.6	8.3	8.3
Incr Delay (d2), s/veh	0.5	3.9	30.7	0.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	3.5	0.5	1.2	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.8	27.4	56.6	3.7	8.9	8.9
LnGrp LOS	C	C	E	A	A	A
Approach Vol, veh/h	304			505	377	
Approach Delay, s/veh	25.0			20.2	8.9	
Approach LOS	C			C	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		14.1	10.0	34.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		4.1		7.1	7.1	5.6
Green Ext Time (p_c), s		4.5		1.6	0.0	4.1

Intersection Summary						
HCM 6th Ctrl Delay			17.8			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰↰	↑↱		↰↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	122	109	285	126	122	111	265	859	135	43	803	107
Future Volume (veh/h)	122	109	285	126	122	111	265	859	135	43	803	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	133	118	310	137	133	121	288	934	147	47	873	116
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	655	555	158	276	251	343	1278	570	60	1045	466
Arrive On Green	0.09	0.35	0.35	0.05	0.31	0.31	0.10	0.36	0.36	0.07	0.59	0.59
Sat Flow, veh/h	1781	1870	1585	3456	902	821	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	133	118	310	137	0	254	288	934	147	47	873	116
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1723	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	8.8	5.3	19.0	4.7	0.0	14.4	9.8	27.4	7.9	3.1	23.9	4.2
Cycle Q Clear(g_c), s	8.8	5.3	19.0	4.7	0.0	14.4	9.8	27.4	7.9	3.1	23.9	4.2
Prop In Lane	1.00		1.00	1.00		0.48	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	160	655	555	158	0	527	343	1278	570	60	1045	466
V/C Ratio(X)	0.83	0.18	0.56	0.86	0.00	0.48	0.84	0.73	0.26	0.78	0.84	0.25
Avail Cap(c_a), veh/h	245	655	555	158	0	527	377	1278	570	74	1045	466
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	53.7	27.1	31.5	56.9	0.0	33.9	53.1	33.4	27.1	55.5	22.4	18.3
Incr Delay (d2), s/veh	8.1	0.6	4.0	34.8	0.0	0.7	13.2	3.7	1.1	20.8	5.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.5	7.9	2.8	0.0	6.1	4.8	11.9	3.2	1.7	6.8	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	27.7	35.5	91.7	0.0	34.6	66.3	37.1	28.2	76.3	28.2	19.2
LnGrp LOS	E	C	D	F	A	C	E	D	C	E	C	B
Approach Vol, veh/h		561			391			1369			1036	
Approach Delay, s/veh		40.1			54.6			42.3			29.4	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	42.8	16.5	43.1	9.7	50.7	11.2	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 13	34.1	* 17	* 31	* 5	42.2	* 5.5	42.0
Max Q Clear Time (g_c+I1), s	11.8	25.9	10.8	16.4	5.1	29.4	6.7	21.0
Green Ext Time (p_c), s	0.1	6.6	0.1	1.3	0.0	10.2	0.0	1.7

Intersection Summary			
HCM 6th Ctrl Delay			39.4
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	190	5	4	155	30	4
Future Vol, veh/h	190	5	4	155	30	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	207	5	4	168	33	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	212	0	386	210
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	176	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1358	-	617	830
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1358	-	615	830
Mov Cap-2 Maneuver	-	-	-	-	615	-
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	852	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	634	-	-	1358	-
HCM Lane V/C Ratio	0.058	-	-	0.003	-
HCM Control Delay (s)	11	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	76	136	109	39	10	32
Future Vol, veh/h	76	136	109	39	10	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	148	118	42	11	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	160	0	-	0	453	139
Stage 1	-	-	-	-	139	-
Stage 2	-	-	-	-	314	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1419	-	-	-	565	909
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1419	-	-	-	529	909
Mov Cap-2 Maneuver	-	-	-	-	529	-
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	741	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1419	-	-	-	776
HCM Lane V/C Ratio	0.058	-	-	-	0.059
HCM Control Delay (s)	7.7	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	110	119	473	383	23
Future Vol, veh/h	30	110	119	473	383	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	120	129	514	416	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	944	429	441	0	-	0
Stage 1	429	-	-	-	-	-
Stage 2	515	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	275	625	1117	-	-	-
Stage 1	656	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	243	625	1117	-	-	-
Mov Cap-2 Maneuver	372	-	-	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	565	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	1.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1117	-	372	625	-	-
HCM Lane V/C Ratio	0.116	-	0.088	0.191	-	-
HCM Control Delay (s)	8.6	-	15.6	12.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.3	0.7	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	0	30	10	0	6	94	0	18	11	0	30
Future Vol, veh/h	19	0	30	10	0	6	94	0	18	11	0	30
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	0	33	11	0	7	102	0	20	12	0	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	259	265	17	271	271	10	33	0	0	20	0	0
Stage 1	41	41	-	214	214	-	-	-	-	-	-	-
Stage 2	218	224	-	57	57	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	694	640	1062	682	636	1071	1579	-	-	1596	-	-
Stage 1	974	861	-	788	725	-	-	-	-	-	-	-
Stage 2	784	718	-	955	847	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	652	594	1062	625	590	1071	1579	-	-	1596	-	-
Mov Cap-2 Maneuver	652	594	-	625	590	-	-	-	-	-	-	-
Stage 1	911	854	-	737	678	-	-	-	-	-	-	-
Stage 2	729	671	-	918	840	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	10	6.2	2
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1579	-	-	854	741	1596	-	-
HCM Lane V/C Ratio	0.065	-	-	0.062	0.023	0.007	-	-
HCM Control Delay (s)	7.4	0	-	9.5	10	7.3	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	13	4	0	4	22	481	7	7	407	13
Future Vol, veh/h	7	0	13	4	0	4	22	481	7	7	407	13
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	-	-	-	0	-	0	100	-	-	100	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	14	4	0	4	24	523	8	8	442	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	768	1037	221	812	-	266	456	0	0	531	0	0
Stage 1	458	458	-	575	-	-	-	-	-	-	-	-
Stage 2	310	579	-	237	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	291	230	783	271	0	732	1101	-	-	1033	-	-
Stage 1	552	565	-	470	0	-	-	-	-	-	-	-
Stage 2	675	499	-	745	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	283	223	783	260	-	732	1101	-	-	1033	-	-
Mov Cap-2 Maneuver	283	223	-	260	-	-	-	-	-	-	-	-
Stage 1	540	560	-	460	-	-	-	-	-	-	-	-
Stage 2	656	488	-	726	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	14.5	0.4	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1101	-	-	484	260	732	1033	-	-
HCM Lane V/C Ratio	0.022	-	-	0.045	0.017	0.006	0.007	-	-
HCM Control Delay (s)	8.3	-	-	12.8	19.1	9.9	8.5	-	-
HCM Lane LOS	A	-	-	B	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.1	0	0	-	-

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INTERNATIONAL

Appendix F: Cumulative Project Traffic Data

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TRANSPORTATION IMPACT ANALYSIS

EL CENTRO LIBRARY

El Centro, California
July 14, 2020

LLG Ref. 3-20-3250

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TRANSPORTATION IMPACT ANALYSIS

EL CENTRO LIBRARY

El Centro, California
July 14, 2020

1.0 INTRODUCTION

The following transportation impact study has been prepared to determine and evaluate the traffic impacts on the local circulation system due to the proposed El Centro Library project. This transportation impact study includes both a LOS and a VMT assessment.

Included in this transportation impact study are the following:

- Project description
- Existing conditions description
- Analysis approach and methodology
- Analysis of existing conditions
- Trip generation/distribution/assignment
- Cumulative traffic discussion
- Analysis of near-term conditions
- Active Transportation Assessment
- Site Access Assessment
- VMT assessment
- Significance of impacts/mitigation measures

2.0 PROJECT DESCRIPTION

The proposed project consists of the construction of a new 19,295 square foot public library which will replace the existing 13,116 square foot library. This site is located on the northwest corner of the Imperial Avenue / Villa Avenue intersection in the City of El Centro. The public library will include a community room space, staff area, reading areas, bookstore, and exterior patios. Site work will include reconfiguration of existing parking, landscape upgrades and stormwater management.

The project proposes two access points, one existing driveway and a new proposed driveway on Villa Avenue.

Figure 2-1 shows the general location of the project, while ***Figure 2-2*** shows a more detailed project area map. ***Figure 2-3*** shows the project's site plan.

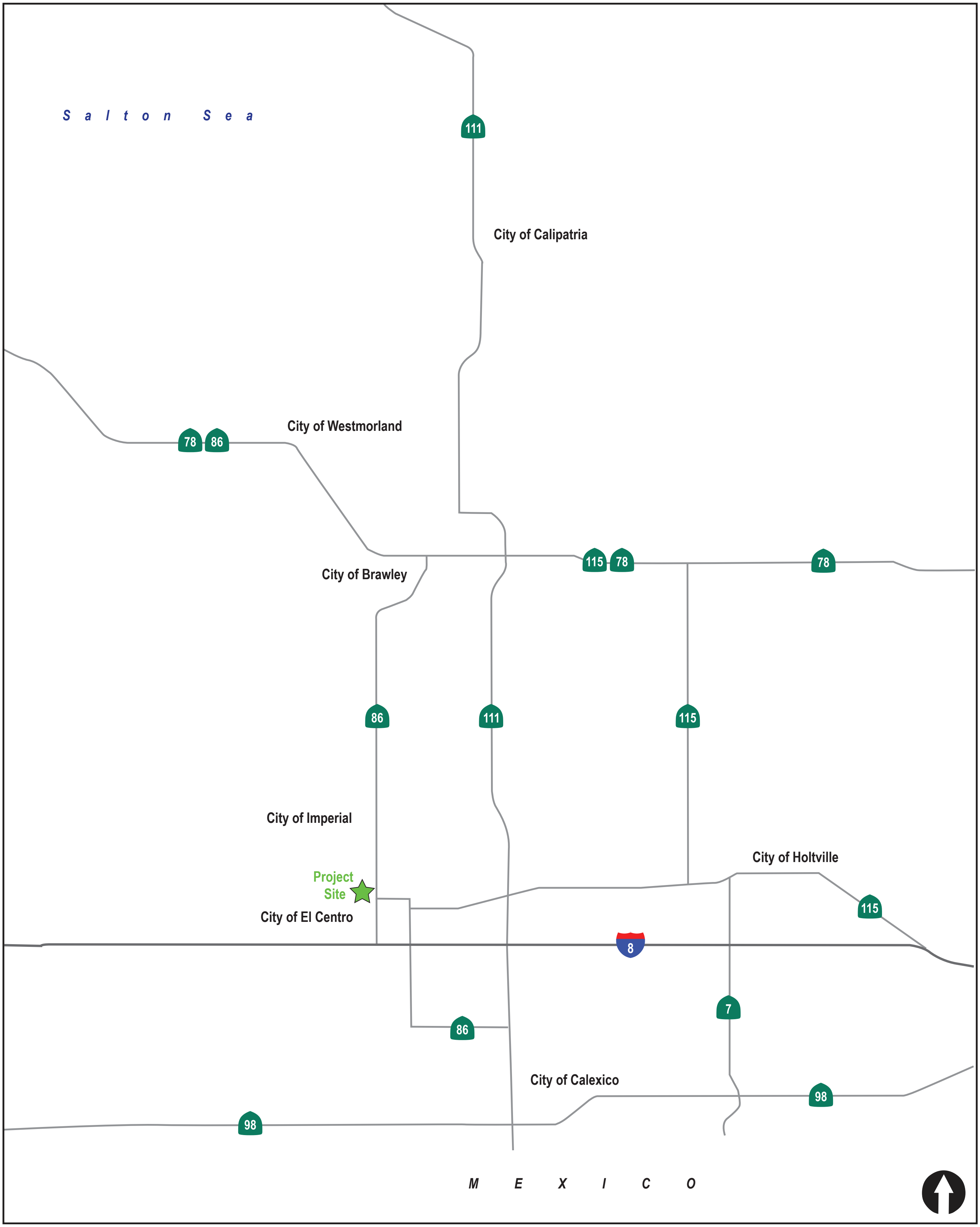

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Figure 2-1

Vicinity Map

EL CENTRO LIBRARY

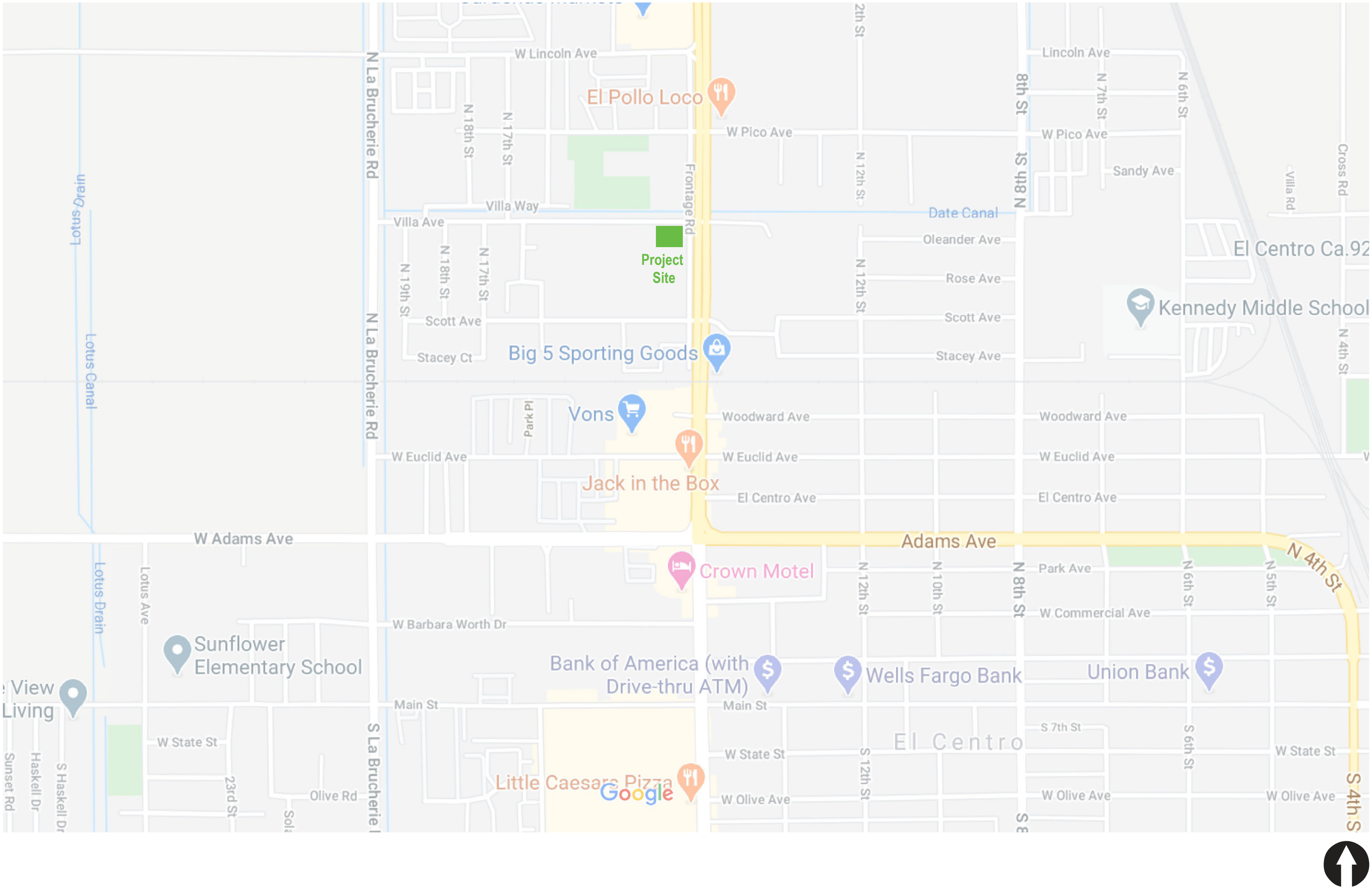

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Figure 2-2

Project Area Map

EL CENTRO LIBRARY

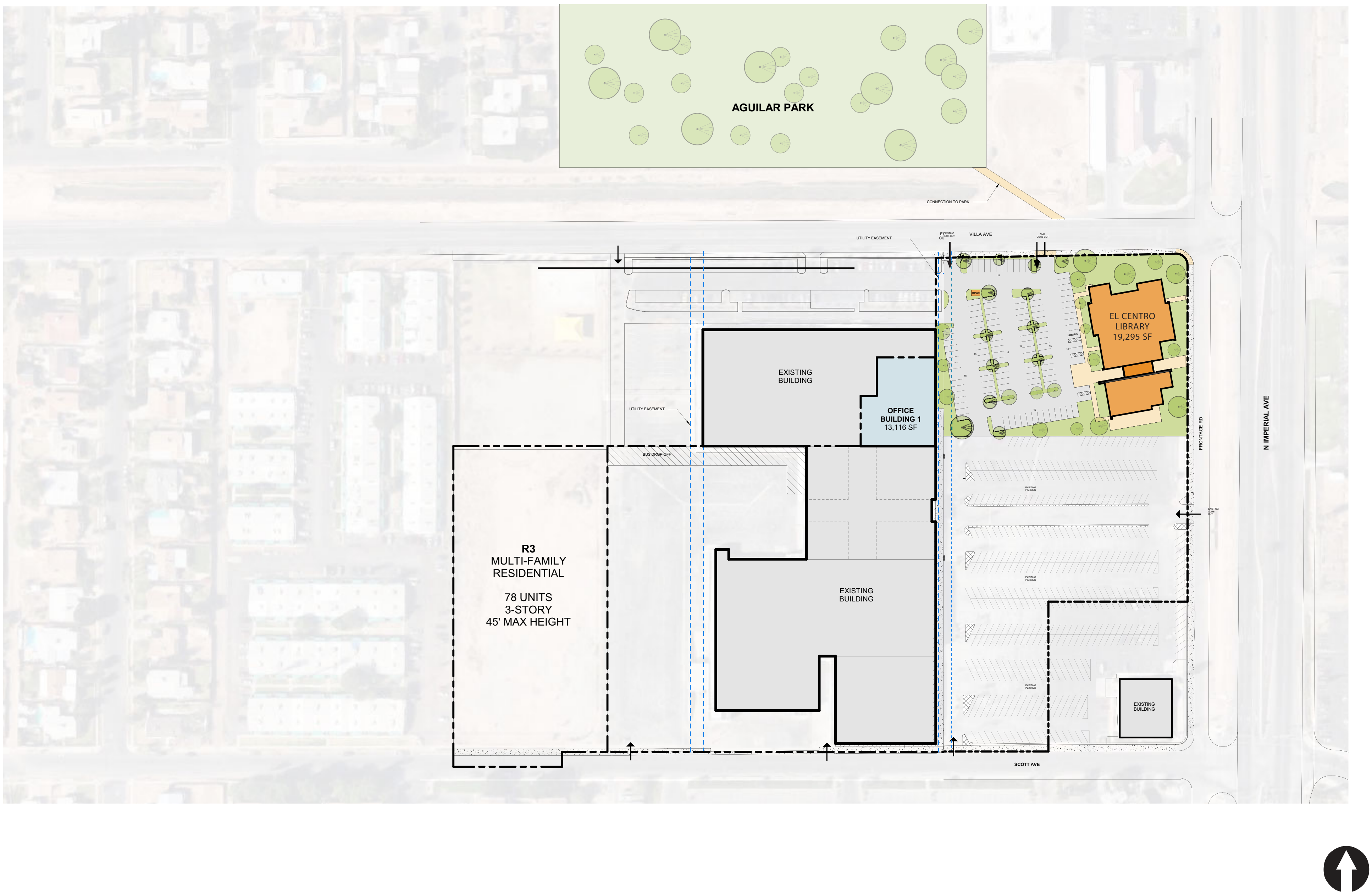

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Figure 2-3

Site Plan

El Centro Library

3.0 EXISTING CONDITIONS

3.1 Study Area

Effective evaluation of the traffic impacts associated with the proposed Project requires an understanding of the existing transportation system within the project area. ***Figure 3–1*** depicts the existing conditions in the Project study area.

The intersection included in the study area is listed below:

1. Imperial Avenue / Villa Avenue

3.2 Existing Street Network

The following is a description of the existing street network in the study area. ***Figure 3-1*** shows an existing conditions diagram.

Imperial Avenue (SR-86) is classified as a Four-Lane Arterial on the *City of El Centro Circulation Element*. Within the Project Study area, Imperial Avenue is constructed as a four-lane divided roadway that runs north/south and serves much of Imperial County. Within our study area, bike lanes are not provided and a bus stop is provided on Frontage Road north of Scott Avenue. . The posted speed limit is 45 mph. Curbside parking is prohibited along both sides of the roadway near the project site.

Villa Avenue is classified as Two-Lane Collector based on the *City of El Centro Circulation Element*. Villa Avenue is currently constructed as a 2-lane undivided roadway with a two-way left-turn lane and runs east/west. Class II bike lanes are provided on both sides of the roadway. The posted speed limit is 25 mph. Curbside parking is permitted on the south side of the roadway.

3.3 Existing Traffic Volumes

Weekday AM/PM peak hour intersection turning movement traffic counts were conducted at the study area intersection in 2005 and 2016, while schools were in session. The through movement traffic counts from 2016 at the intersection of Bradshaw Avenue / Imperial Avenue and the turning movement traffic counts from 2005 at the intersection of Villa Avenue / Imperial Avenue were utilized at the study area intersection. A growth factor of 1% per year was applied to the traffic counts in order to generate traffic counts that would replicate existing volumes. 2020 counts cannot be conducted since traffic counts are lower due to the COVID-19 pandemic. The peak hour counts were conducted during the commuter peak hours of 7:00-9:00 AM and 4:00-6:00 PM.

Figure 3–2 shows the Existing Traffic Volumes. ***Appendix A*** contains the manual count sheets.

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Figure 3-1

Existing Conditions Diagram

El Centro Library

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Figure 3-2

Existing Traffic Volumes

El Centro Library

4.0 Analysis Approach and Methodology

4.1 Analysis Approach

The peak hour intersection and daily street segment analyses presented in this report were conducted for *Existing, , Existing + Project, and Existing + Project + Cumulative traffic* conditions.

Table 4–1 lists the scenarios analyzed in this report.

Table 4–1
Analysis Scenarios

- Existing
- Existing + Project
- Existing + Project + Cumulative Traffic

Existing conditions represents the existing on-the-ground network and traffic volume conditions.

Existing + Project conditions represents the operations of the existing street network with the addition of the traffic generated by Project land uses.

Existing + Project + Cumulative Traffic conditions represents the time period in which the Project would be expected to be built and fully occupied. Under such conditions, it would be expected that other nearby development or infrastructure projects would contribute to growth in the area which would increase the overall traffic volumes in the area. *Section 8* discusses cumulative conditions in greater detail.

4.2 Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.3 Intersections

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 19 of the *2010 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 9) computer software.

In this analysis, movements with very low AM and PM peak hour volumes were not included. Analysis of movements with AM and PM peak hour volumes of 50 or less do not create significant impacts, and therefore were not incorporated.

5.0 ANALYSIS OF EXISTING CONDITIONS

5.1 Intersection Analysis

Table 6–1 summarizes the peak hour intersection operations under Existing conditions. As shown, the critical movements (NBL, EBR, and SBL) are calculated to currently operate acceptably at LOS B or better during the AM and PM peak hours.

Appendix B contains the intersection analysis worksheets.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour		Existing	
				Delay [a]	LOS [b]
1. Imperial Avenue / Villa Avenue	TWSC[c]	AM	NBL	10.8	B
			EBR	13.4	B
			SBL	8.9	A
		PM	NBL	9.9	A
			EBR	11.7	B
			SBL	9.2	A

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Two-Way Stop Controlled Intersection.

Notes:
NBL = Northbound Left
EBR = Eastbound Right
SBL = Southbound Left

UNSIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

6.0 TRIP GENERATION / DISTRIBUTION / ASSIGNMENT

The following is a discussion of the project trip generation calculations and the project traffic distribution and assignment on the local network.

6.1 Trip Generation

Trip generation estimates for the proposed development were calculated based on ITE rates provided in the *Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition* for the San Region. The "Library" rates were utilized**.** ***Table 6-1*** shows the project is calculated to generate 1,389 ADT with 13 inbound / 5 outbound trips during the AM peak hour and 75 inbound / 82 outbound trips during the PM peak hour.

6.2 Project Traffic Distribution /Assignment

The generated project traffic was distributed and assigned to the street system primarily based on the existing traffic counts and other factors such as project access and the proximity of the project to I-8, SR-86 and other major arterials.

Figure 6-1 presents the estimated project traffic distribution. The assignment of project traffic to the surrounding circulation system was based on this estimated distribution and is illustrated in ***Figure 6-2***. ***Figure 6-3*** shows the Existing + Project traffic volumes.

TABLE 7–1
TRIP GENERATION SUMMARY

Use	Quantity	Daily Trip Ends (ADTS)[a]		AM Peak Hour					PM Peak Hour				
		Rate [b]	Volume	% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Library	19.295 KSF	72 /KSF	**1,379**	1.3%	71%:29%	13	5	**18**	11.3%	48%:52%	75	82	**157**

Footnotes:

a. Rates are based on the *Institute of Transportation Engineers (ITE) Trip Generation Manual 10th Edition* for the San Diego Region.

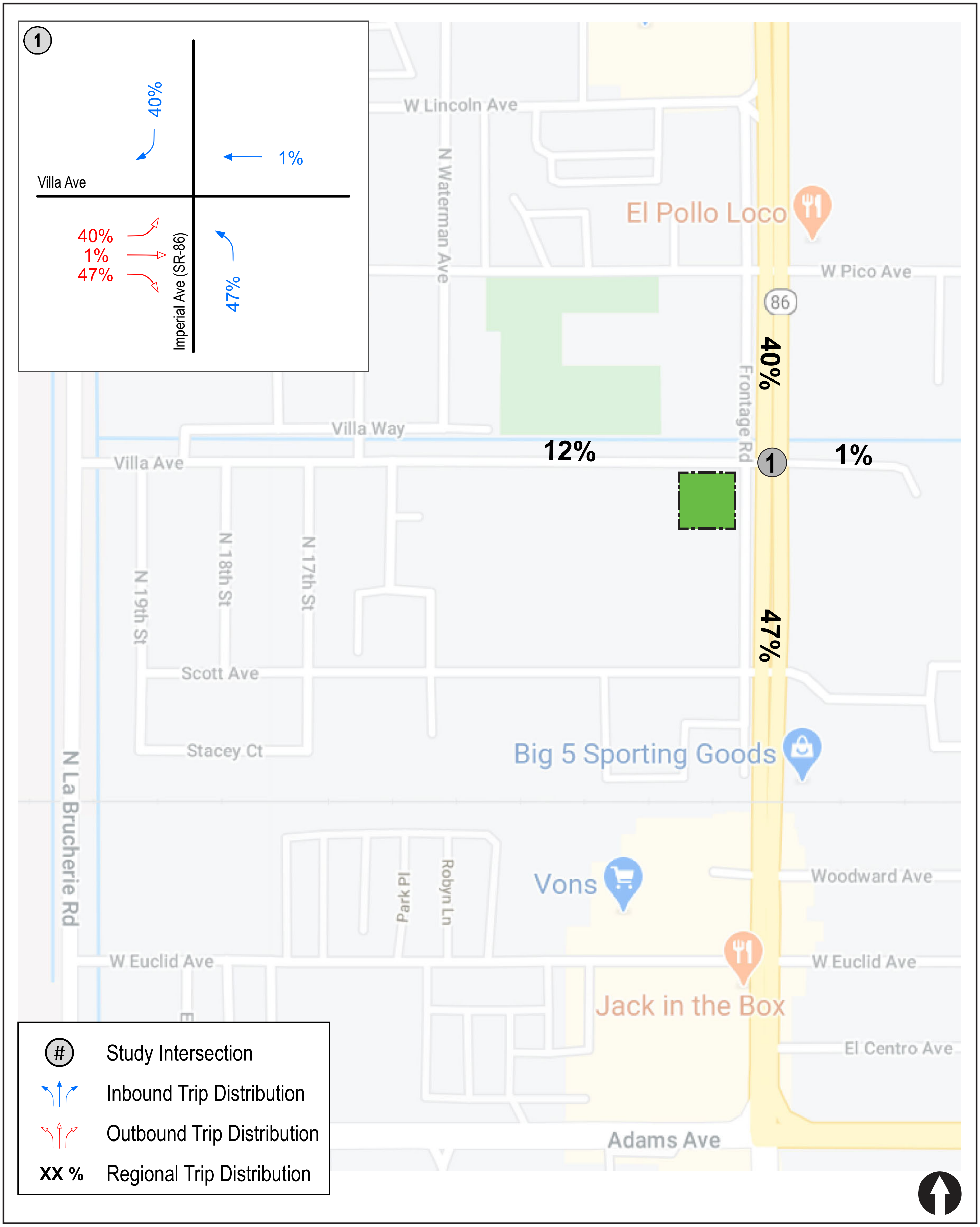

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Figure 6-1

Project Traffic Distribution

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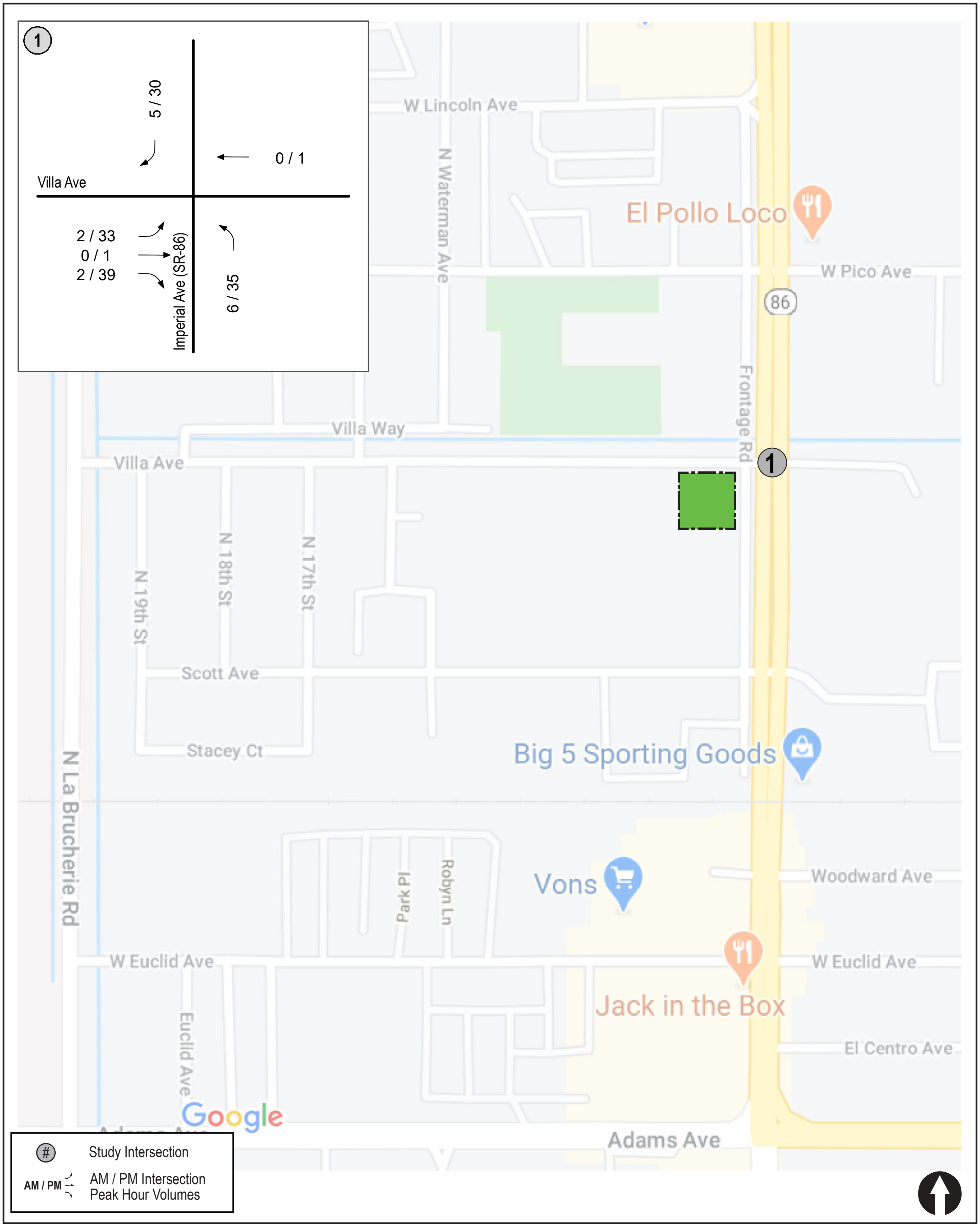

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Figure 6-2

Project Traffic Volumes

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Appendix G: Opening Year 2022 Without Project HCM Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	85	102	26	78	79	152	526	48	127	919	205
Future Volume (veh/h)	105	85	102	26	78	79	152	526	48	127	919	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	106	102	28	85	86	165	572	52	138	999	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	723	613	88	284	288	221	1059	458	154	1142	494
Arrive On Green	0.08	0.39	0.39	0.03	0.33	0.33	0.06	0.29	0.29	0.09	0.31	0.31
Sat Flow, veh/h	1781	1870	1585	3456	853	863	3456	3666	1585	1781	3666	1585
Grp Volume(v), veh/h	114	106	102	28	0	171	165	572	52	138	999	223
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1715	1728	1833	1585	1781	1833	1585
Q Serve(g_s), s	7.5	4.4	5.0	0.9	0.0	8.8	5.6	15.6	2.9	9.1	30.7	13.4
Cycle Q Clear(g_c), s	7.5	4.4	5.0	0.9	0.0	8.8	5.6	15.6	2.9	9.1	30.7	13.4
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	723	613	88	0	572	221	1059	458	154	1142	494
V/C Ratio(X)	0.82	0.15	0.17	0.32	0.00	0.30	0.75	0.54	0.11	0.90	0.88	0.45
Avail Cap(c_a), veh/h	228	723	613	145	0	572	299	1059	458	154	1142	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	23.7	23.9	57.0	0.0	29.4	54.7	35.6	31.1	53.8	38.8	32.8
Incr Delay (d2), s/veh	4.4	0.4	0.6	2.1	0.0	0.3	3.4	1.7	0.4	43.4	9.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	2.0	2.0	0.4	0.0	3.7	2.5	7.0	1.2	5.8	14.7	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.4	24.2	24.5	59.1	0.0	29.7	58.2	37.3	31.5	97.2	48.2	35.8
LnGrp LOS	E	C	C	E	A	C	E	D	C	F	D	D
Approach Vol, veh/h		322			199			789			1360	
Approach Delay, s/veh		36.4			33.8			41.3			51.2	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	44.6	15.0	46.1	16.0	41.9	8.7	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 10	32.4	* 15	* 36	* 10	32.4	* 5	46.0
Max Q Clear Time (g_c+I1), s	7.6	32.7	9.5	10.8	11.1	17.6	2.9	7.0
Green Ext Time (p_c), s	0.1	0.0	0.1	1.0	0.0	7.7	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	45.2
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	141	184	0	0	1
Future Vol, veh/h	0	141	184	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	153	200	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	200	0	-	0	277	100
Stage 1	-	-	-	-	200	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1370	-	-	-	690	936
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1370	-	-	-	690	936
Mov Cap-2 Maneuver	-	-	-	-	690	-
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	937	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1370	-	-	-	936
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.5					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	138	6	3	175	9	7
Future Vol, veh/h	138	6	3	175	9	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	150	7	3	190	10	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	157	0	255	79
Stage 1	-	-	-	-	154	-
Stage 2	-	-	-	-	101	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1420	-	712	965
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	912	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1420	-	711	965
Mov Cap-2 Maneuver	-	-	-	-	711	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	910	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	804	-	-	1420	-
HCM Lane V/C Ratio	0.022	-	-	0.002	-
HCM Control Delay (s)	9.6	-	-	7.5	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	72	112	271	322	64
Future Volume (veh/h)	75	72	112	271	322	64
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	78	122	295	350	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	342	157	156	2504	1612	319
Arrive On Green	0.10	0.10	0.09	0.70	0.55	0.55
Sat Flow, veh/h	3456	1585	1781	3647	3050	585
Grp Volume(v), veh/h	82	78	122	295	209	211
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1765
Q Serve(g_s), s	1.2	2.6	3.7	1.5	3.4	3.4
Cycle Q Clear(g_c), s	1.2	2.6	3.7	1.5	3.4	3.4
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	342	157	156	2504	969	962
V/C Ratio(X)	0.24	0.50	0.78	0.12	0.22	0.22
Avail Cap(c_a), veh/h	1868	857	193	2504	969	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	23.7	24.8	2.6	6.5	6.5
Incr Delay (d2), s/veh	0.5	3.4	12.1	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	2.4	2.0	0.3	1.1	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.6	27.1	36.9	2.7	7.0	7.0
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	160			417	420	
Approach Delay, s/veh	25.3			12.7	7.0	
Approach LOS	C			B	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		11.0	8.9	35.6
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		3.5		4.6	5.7	5.4
Green Ext Time (p_c), s		3.8		0.8	0.0	4.6
Intersection Summary						
HCM 6th Ctrl Delay			12.3			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	52	124	77	51	33	119	652	62	23	965	60
Future Volume (veh/h)	50	52	124	77	51	33	119	652	62	23	965	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	57	135	84	55	36	129	709	67	25	1049	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	70	655	555	135	369	242	182	1338	597	42	1234	550
Arrive On Green	0.04	0.35	0.35	0.04	0.35	0.35	0.05	0.38	0.38	0.05	0.69	0.69
Sat Flow, veh/h	1781	1870	1585	3456	1055	691	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	54	57	135	84	0	91	129	709	67	25	1049	65
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1746	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.6	2.5	7.3	2.9	0.0	4.3	4.4	18.6	3.3	1.7	26.4	1.6
Cycle Q Clear(g_c), s	3.6	2.5	7.3	2.9	0.0	4.3	4.4	18.6	3.3	1.7	26.4	1.6
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	70	655	555	135	0	611	182	1338	597	42	1234	550
V/C Ratio(X)	0.78	0.09	0.24	0.62	0.00	0.15	0.71	0.53	0.11	0.60	0.85	0.12
Avail Cap(c_a), veh/h	137	655	555	144	0	611	196	1338	597	74	1234	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.30	0.30	0.30
Uniform Delay (d), s/veh	57.1	26.1	27.7	56.8	0.0	26.7	55.9	29.1	24.4	56.6	16.0	12.2
Incr Delay (d2), s/veh	6.7	0.3	1.0	5.0	0.0	0.1	8.4	1.5	0.4	1.5	2.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.2	2.9	1.3	0.0	1.8	2.1	7.9	1.3	0.7	5.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	26.4	28.8	61.7	0.0	26.9	64.3	30.6	24.7	58.1	18.4	12.3
LnGrp LOS	E	C	C	E	A	C	E	C	C	E	B	B
Approach Vol, veh/h		246			175			905			1139	
Approach Delay, s/veh		35.9			43.6			35.0			18.9	
Approach LOS		D			D			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	49.2	10.4	48.4	8.5	52.7	10.4	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 6.8	40.9	* 9.2	* 38	* 5	42.7	* 5	42.0
Max Q Clear Time (g_c+I1), s	6.4	28.4	5.6	6.3	3.7	20.6	4.9	9.3
Green Ext Time (p_c), s	0.0	10.2	0.0	0.5	0.0	12.3	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	1.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	84	2	5	91	18	2
Future Vol, veh/h	84	2	5	91	18	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	2	5	99	20	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	93	0	201	92
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	109	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1501	-	788	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	916	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1501	-	785	965
Mov Cap-2 Maneuver	-	-	-	-	785	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	912	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	800	-	-	1501	-
HCM Lane V/C Ratio	0.027	-	-	0.004	-
HCM Control Delay (s)	9.6	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	70	65	8	10	30
Future Vol, veh/h	19	70	65	8	10	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	76	71	9	11	33

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	80	0	-	0	194	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	118	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1518	-	-	-	795	985
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	907	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1518	-	-	-	784	985
Mov Cap-2 Maneuver	-	-	-	-	784	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	907	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1518	-	-	-	926
HCM Lane V/C Ratio	0.014	-	-	-	0.047
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	53	53	400	385	15
Future Vol, veh/h	11	53	53	400	385	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	58	58	435	418	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	760	426	434	0	-	0
Stage 1	426	-	-	-	-	-
Stage 2	334	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	358	628	1124	-	-	-
Stage 1	658	-	-	-	-	-
Stage 2	698	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	339	628	1124	-	-	-
Mov Cap-2 Maneuver	454	-	-	-	-	-
Stage 1	624	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1124	-	454	628	-	-
HCM Lane V/C Ratio	0.051	-	0.026	0.092	-	-
HCM Control Delay (s)	8.4	-	13.1	11.3	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	40	0	0	0	26	0	0	0	0	9
Future Vol, veh/h	17	0	40	0	0	0	26	0	0	0	0	9
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	43	0	0	0	28	0	0	0	0	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	61	61	5	83	66	0	10	0	0	0	0	0
Stage 1	5	5	-	56	56	-	-	-	-	-	-	-
Stage 2	56	56	-	27	10	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	934	830	1078	904	825	-	1610	-	-	-	-	-
Stage 1	1017	892	-	956	848	-	-	-	-	-	-	-
Stage 2	956	848	-	990	887	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	816	1078	856	811	-	1610	-	-	-	-	-
Mov Cap-2 Maneuver	-	816	-	856	811	-	-	-	-	-	-	-
Stage 1	1000	892	-	940	834	-	-	-	-	-	-	-
Stage 2	940	834	-	950	887	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		0	7.3	0
HCM LOS	-	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.018	-	-	-	-	-	-	-
HCM Control Delay (s)	7.3	0	-	-	0	0	-	-
HCM Lane LOS	A	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	412	2	2	394
Future Vol, veh/h	7	6	412	2	2	394
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	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	7	448	2	2	428

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	667	225	0	0	450	0
Stage 1	449	-	-	-	-	-
Stage 2	218	-	-	-	-	-
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	392	778	-	-	1107	-
Stage 1	610	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	391	778	-	-	1107	-
Mov Cap-2 Maneuver	487	-	-	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	795	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	487	778	1107	-
HCM Lane V/C Ratio	-	-	0.016	0.008	0.002	-
HCM Control Delay (s)	-	-	12.5	9.7	8.3	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	2	444	2	1	426
Future Vol, veh/h	7	2	444	2	1	426
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	2	483	2	1	463

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	718	243	0	0	485	0
Stage 1	484	-	-	-	-	-
Stage 2	234	-	-	-	-	-
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	364	758	-	-	1074	-
Stage 1	585	-	-	-	-	-
Stage 2	783	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	364	758	-	-	1074	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	782	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	412	1074	-
HCM Lane V/C Ratio	-	-	0.024	0.001	-
HCM Control Delay (s)	-	-	14	8.4	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	212	261	23	167	110	340	709	68	134	773	246
Future Volume (veh/h)	278	212	261	23	167	110	340	709	68	134	773	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	302	270	257	25	182	120	370	771	74	146	840	267
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	717	608	81	234	154	325	1048	467	156	1024	457
Arrive On Green	0.18	0.38	0.38	0.02	0.22	0.22	0.13	0.39	0.39	0.09	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	3456	1052	694	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	302	270	257	25	0	302	370	771	74	146	840	267
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1746	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	20.0	12.5	14.3	0.9	0.0	19.5	11.3	22.2	3.6	9.8	26.4	17.3
Cycle Q Clear(g_c), s	20.0	12.5	14.3	0.9	0.0	19.5	11.3	22.2	3.6	9.8	26.4	17.3
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	717	608	81	0	388	325	1048	467	156	1024	457
V/C Ratio(X)	0.92	0.38	0.42	0.31	0.00	0.78	1.14	0.74	0.16	0.94	0.82	0.58
Avail Cap(c_a), veh/h	373	717	608	144	0	388	325	1048	467	156	1024	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.54	0.54	0.54	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	26.7	27.2	57.6	0.0	43.9	52.5	32.5	26.8	54.4	39.8	36.6
Incr Delay (d2), s/veh	24.3	1.5	2.2	2.1	0.0	9.7	80.6	2.5	0.4	53.5	7.4	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.1	5.9	5.8	0.4	0.0	9.5	8.2	8.8	1.4	6.6	12.1	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.3	28.2	29.4	59.7	0.0	53.5	133.1	35.0	27.2	107.9	47.2	42.0
LnGrp LOS	E	C	C	E	A	D	F	D	C	F	D	D
Approach Vol, veh/h		829			327			1215			1253	
Approach Delay, s/veh		44.6			54.0			64.4			53.1	
Approach LOS		D			D			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	42.1	27.8	33.1	16.2	42.9	8.5	52.4				
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4				
Max Green Setting (Gmax), s	* 11	32.4	* 25	* 26	* 11	33.2	* 5	46.0				
Max Q Clear Time (g_c+I1), s	13.3	28.4	22.0	21.5	11.8	24.2	2.9	16.3				
Green Ext Time (p_c), s	0.0	3.4	0.2	0.7	0.0	6.5	0.0	2.6				
Intersection Summary												
HCM 6th Ctrl Delay			55.1									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	293	212	0	0	1
Future Vol, veh/h	1	293	212	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	318	230	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	230	0	-	0	391	115
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	161	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1335	-	-	-	585	916
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1335	-	-	-	584	916
Mov Cap-2 Maneuver	-	-	-	-	584	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	851	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1335	-	-	-	916
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s)	7.7	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	274	22	10	196	17	4
Future Vol, veh/h	274	22	10	196	17	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	298	24	11	213	18	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	322	0	439	161
Stage 1	-	-	-	-	310	-
Stage 2	-	-	-	-	129	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1235	-	546	855
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	883	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	541	855
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	875	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	582	-	-	1235	-
HCM Lane V/C Ratio	0.039	-	-	0.009	-
HCM Control Delay (s)	11.4	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	148	131	144	331	293	62
Future Volume (veh/h)	148	131	144	331	293	62
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	161	142	157	360	318	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	500	229	183	2377	1458	303
Arrive On Green	0.14	0.14	0.10	0.67	0.50	0.50
Sat Flow, veh/h	3456	1585	1781	3647	3022	609
Grp Volume(v), veh/h	161	142	157	360	191	194
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1761
Q Serve(g_s), s	2.4	4.9	5.1	2.2	3.5	3.6
Cycle Q Clear(g_c), s	2.4	4.9	5.1	2.2	3.5	3.6
Prop In Lane	1.00	1.00	1.00			0.35
Lane Grp Cap(c), veh/h	500	229	183	2377	885	877
V/C Ratio(X)	0.32	0.62	0.86	0.15	0.22	0.22
Avail Cap(c_a), veh/h	1774	814	183	2377	885	877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.4	23.5	25.8	3.6	8.3	8.3
Incr Delay (d2), s/veh	0.5	3.9	30.0	0.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.2	3.5	0.5	1.2	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.0	27.3	55.9	3.7	8.8	8.9
LnGrp LOS	C	C	E	A	A	A
Approach Vol, veh/h	303			517	385	
Approach Delay, s/veh	25.0			19.5	8.8	
Approach LOS	C			B	A	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		13.9	10.0	34.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		4.2		6.9	7.1	5.6
Green Ext Time (p_c), s		4.7		1.6	0.0	4.2
Intersection Summary						
HCM 6th Ctrl Delay			17.5			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	113	296	125	127	114	276	944	128	43	904	111
Future Volume (veh/h)	127	113	296	125	127	114	276	944	128	43	904	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	123	322	136	138	124	300	1026	139	47	983	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	655	555	158	275	247	354	1278	570	60	1034	461
Arrive On Green	0.09	0.35	0.35	0.05	0.30	0.30	0.10	0.36	0.36	0.07	0.58	0.58
Sat Flow, veh/h	1781	1870	1585	3456	908	816	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	138	123	322	136	0	262	300	1026	139	47	983	121
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1724	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.1	5.5	19.9	4.7	0.0	15.0	10.2	31.2	7.4	3.1	31.1	4.5
Cycle Q Clear(g_c), s	9.1	5.5	19.9	4.7	0.0	15.0	10.2	31.2	7.4	3.1	31.1	4.5
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	165	655	555	158	0	523	354	1278	570	60	1034	461
V/C Ratio(X)	0.84	0.19	0.58	0.86	0.00	0.50	0.85	0.80	0.24	0.78	0.95	0.26
Avail Cap(c_a), veh/h	245	655	555	158	0	523	377	1278	570	74	1034	461
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.59	0.59	0.59
Uniform Delay (d), s/veh	53.6	27.1	31.8	56.9	0.0	34.3	52.9	34.6	27.0	55.5	24.3	18.7
Incr Delay (d2), s/veh	9.7	0.6	4.4	33.5	0.0	0.8	14.5	5.4	1.0	17.5	12.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	2.6	8.3	2.8	0.0	6.4	5.0	13.8	3.0	1.6	9.3	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	27.8	36.2	90.3	0.0	35.1	67.4	40.0	28.0	73.0	37.0	19.6
LnGrp LOS	E	C	D	F	A	D	E	D	C	E	D	B
Approach Vol, veh/h		583			398			1465			1151	
Approach Delay, s/veh		40.8			54.0			44.5			36.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	42.4	16.8	42.8	9.7	50.7	11.2	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 13	34.1	* 17	* 31	* 5	42.2	* 5.5	42.0
Max Q Clear Time (g_c+I1), s	12.2	33.1	11.1	17.0	5.1	33.2	6.7	21.9
Green Ext Time (p_c), s	0.1	0.9	0.1	1.3	0.0	7.7	0.0	1.8

Intersection Summary			
HCM 6th Ctrl Delay			42.4
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	7	4	150	33	4
Future Vol, veh/h	178	7	4	150	33	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	8	4	163	36	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	201	0	368	197
Stage 1	-	-	-	-	197	-
Stage 2	-	-	-	-	171	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1371	-	632	844
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	859	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1371	-	630	844
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	836	-
Stage 2	-	-	-	-	856	-

Approach	EB			WB	NB
HCM Control Delay, s	0			0.2	10.9
HCM LOS					B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	648	-	-	1371	-
HCM Lane V/C Ratio	0.062	-	-	0.003	-
HCM Control Delay (s)	10.9	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	70	131	108	32	5	27
Future Vol, veh/h	70	131	108	32	5	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	142	117	35	5	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	429	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	294	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1429	-	-	-	583	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	549	914
Mov Cap-2 Maneuver	-	-	-	-	549	-
Stage 1	-	-	-	-	839	-
Stage 2	-	-	-	-	756	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	828
HCM Lane V/C Ratio	0.053	-	-	-	0.042
HCM Control Delay (s)	7.7	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	112	117	483	392	18
Future Vol, veh/h	19	112	117	483	392	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	122	127	525	426	20

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	953	436	446	0	-	0
Stage 1	436	-	-	-	-	-
Stage 2	517	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	272	619	1112	-	-	-
Stage 1	651	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	241	619	1112	-	-	-
Mov Cap-2 Maneuver	370	-	-	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	564	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	1.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1112	-	370	619	-	-
HCM Lane V/C Ratio	0.114	-	0.056	0.197	-	-
HCM Control Delay (s)	8.7	-	15.3	12.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.7	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	31	0	0	0	98	0	0	0	0	31
Future Vol, veh/h	20	0	31	0	0	0	98	0	0	0	0	31
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	0	34	0	0	0	107	0	0	0	0	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	231	231	17	248	248	0	34	0	0	0	0	0
Stage 1	17	17	-	214	214	-	-	-	-	-	-	-
Stage 2	214	214	-	34	34	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	724	669	1062	706	655	-	1578	-	-	-	-	-
Stage 1	1002	881	-	788	725	-	-	-	-	-	-	-
Stage 2	788	725	-	982	867	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	624	1062	648	610	-	1578	-	-	-	-	-
Mov Cap-2 Maneuver	-	624	-	648	610	-	-	-	-	-	-	-
Stage 1	934	881	-	734	676	-	-	-	-	-	-	-
Stage 2	734	676	-	951	867	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		0	7.4	0
HCM LOS	-	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.068	-	-	-	-	-	-	-
HCM Control Delay (s)	7.4	0	-	-	0	0	-	-
HCM Lane LOS	A	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	500	7	7	424
Future Vol, veh/h	4	4	500	7	7	424
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	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	4	543	8	8	461

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	794	276	0	0	551	0
Stage 1	547	-	-	-	-	-
Stage 2	247	-	-	-	-	-
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	325	721	-	-	1015	-
Stage 1	544	-	-	-	-	-
Stage 2	771	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	322	721	-	-	1015	-
Mov Cap-2 Maneuver	429	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	765	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	429	721	1015	-
HCM Lane V/C Ratio	-	-	0.01	0.006	0.007	-
HCM Control Delay (s)	-	-	13.5	10	8.6	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	1	567	8	3	497
Future Vol, veh/h	5	1	567	8	3	497
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1	616	9	3	540

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	897	313	0	0	625	0
Stage 1	621	-	-	-	-	-
Stage 2	276	-	-	-	-	-
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	279	683	-	-	952	-
Stage 1	498	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	278	683	-	-	952	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	744	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	308	952	-
HCM Lane V/C Ratio	-	-	0.021	0.003	-
HCM Control Delay (s)	-	-	16.9	8.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Appendix H: Opening Year 2022 + Project HCM Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	86	102	36	81	82	152	529	51	128	922	205
Future Volume (veh/h)	105	86	102	36	81	82	152	529	51	128	922	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	106	102	39	88	89	165	575	55	139	1002	223
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	140	717	608	105	285	289	221	1012	451	162	1107	494
Arrive On Green	0.08	0.38	0.38	0.03	0.33	0.33	0.06	0.28	0.28	0.09	0.31	0.31
Sat Flow, veh/h	1781	1870	1585	3456	853	862	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	114	106	102	39	0	177	165	575	55	139	1002	223
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1715	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	7.6	4.4	5.1	1.3	0.0	9.2	5.6	16.6	3.1	9.2	32.4	13.5
Cycle Q Clear(g_c), s	7.6	4.4	5.1	1.3	0.0	9.2	5.6	16.6	3.1	9.2	32.4	13.5
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	717	608	105	0	574	221	1012	451	162	1107	494
V/C Ratio(X)	0.81	0.15	0.17	0.37	0.00	0.31	0.75	0.57	0.12	0.86	0.91	0.45
Avail Cap(c_a), veh/h	384	717	608	144	0	574	325	1012	451	162	1107	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	24.2	24.4	57.1	0.0	29.6	55.2	36.6	31.8	53.8	39.6	33.1
Incr Delay (d2), s/veh	4.2	0.4	0.6	2.2	0.0	0.3	1.8	1.9	0.5	34.3	12.1	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	2.1	2.0	0.6	0.0	3.9	2.5	7.2	1.3	5.6	15.4	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6	24.6	25.0	59.2	0.0	29.9	57.0	38.6	32.3	88.1	51.7	36.1
LnGrp LOS	E	C	C	E	A	C	E	D	C	F	D	D
Approach Vol, veh/h		322			216			795			1364	
Approach Delay, s/veh		36.8			35.2			41.9			52.9	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	44.9	15.2	46.6	16.6	41.7	9.3	52.4				
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4				
Max Green Setting (Gmax), s	* 11	32.4	* 26	* 25	* 11	32.8	* 5	46.0				
Max Q Clear Time (g_c+I1), s	7.6	34.4	9.6	11.2	11.2	18.6	3.3	7.1				
Green Ext Time (p_c), s	0.1	0.0	0.1	0.8	0.0	7.5	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			46.3									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	146	201	0	0	1
Future Vol, veh/h	0	146	201	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	159	218	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	218	0	-	0	298	109
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	80	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1349	-	-	-	669	924
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	934	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1349	-	-	-	669	924
Mov Cap-2 Maneuver	-	-	-	-	669	-
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	934	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1349	-	-	-	924
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑↑	Y	
Traffic Vol, veh/h	141	8	3	185	17	10
Future Vol, veh/h	141	8	3	185	17	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	153	9	3	201	18	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	162	0	265	81
Stage 1	-	-	-	-	158	-
Stage 2	-	-	-	-	107	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1414	-	702	963
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1414	-	701	963
Mov Cap-2 Maneuver	-	-	-	-	701	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	904	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	780	-	-	1414	-
HCM Lane V/C Ratio	0.038	-	-	0.002	-
HCM Control Delay (s)	9.8	-	-	7.6	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	78	75	122	274	323	65
Future Volume (veh/h)	78	75	122	274	323	65
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	85	82	133	298	351	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	345	158	169	2502	1584	317
Arrive On Green	0.10	0.10	0.10	0.70	0.54	0.54
Sat Flow, veh/h	3456	1585	1781	3647	3044	590
Grp Volume(v), veh/h	85	82	133	298	210	212
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1764
Q Serve(g_s), s	1.3	2.7	4.1	1.5	3.4	3.5
Cycle Q Clear(g_c), s	1.3	2.7	4.1	1.5	3.4	3.5
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	345	158	169	2502	954	947
V/C Ratio(X)	0.25	0.52	0.79	0.12	0.22	0.22
Avail Cap(c_a), veh/h	1866	856	192	2502	954	947
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.1	23.7	24.6	2.7	6.8	6.8
Incr Delay (d2), s/veh	0.5	3.7	14.6	0.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.2	2.2	0.3	1.1	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.6	27.4	39.2	2.8	7.3	7.3
LnGrp LOS	C	C	D	A	A	A
Approach Vol, veh/h	167			431	422	
Approach Delay, s/veh	25.5			14.0	7.3	
Approach LOS	C			B	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		11.0	9.3	35.2
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		3.5		4.7	6.1	5.5
Green Ext Time (p_c), s		3.8		0.8	0.0	4.6

Intersection Summary			
HCM 6th Ctrl Delay			13.1
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	53	124	90	54	36	119	655	66	24	975	60
Future Volume (veh/h)	50	53	124	90	54	36	119	655	66	24	975	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	58	135	98	59	39	129	712	72	26	1060	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	70	655	555	148	372	246	181	1322	590	43	1222	545
Arrive On Green	0.04	0.35	0.35	0.04	0.35	0.35	0.05	0.37	0.37	0.05	0.69	0.69
Sat Flow, veh/h	1781	1870	1585	3456	1051	695	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	54	58	135	98	0	98	129	712	72	26	1060	65
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1745	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	3.6	2.5	7.3	3.4	0.0	4.6	4.4	18.9	3.6	1.7	27.7	1.7
Cycle Q Clear(g_c), s	3.6	2.5	7.3	3.4	0.0	4.6	4.4	18.9	3.6	1.7	27.7	1.7
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	70	655	555	148	0	618	181	1322	590	43	1222	545
V/C Ratio(X)	0.78	0.09	0.24	0.66	0.00	0.16	0.71	0.54	0.12	0.60	0.87	0.12
Avail Cap(c_a), veh/h	137	655	555	153	0	618	181	1322	590	74	1222	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.31	0.31	0.31
Uniform Delay (d), s/veh	57.1	26.2	27.7	56.6	0.0	26.5	56.0	29.6	24.8	56.5	16.6	12.6
Incr Delay (d2), s/veh	6.7	0.3	1.0	7.7	0.0	0.1	10.6	1.6	0.4	1.6	2.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.2	2.9	1.6	0.0	2.0	2.1	8.0	1.4	0.8	5.9	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	26.4	28.8	64.3	0.0	26.7	66.5	31.2	25.2	58.1	19.5	12.7
LnGrp LOS	E	C	C	E	A	C	E	C	C	E	B	B
Approach Vol, veh/h		247			196			913			1151	
Approach Delay, s/veh		35.9			45.5			35.7			20.0	
Approach LOS		D			D			D			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	48.8	10.4	48.9	8.6	52.2	10.8	48.4				
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4				
Max Green Setting (Gmax), s	* 6.3	41.1	* 9.2	* 38	* 5	42.4	* 5.3	42.0				
Max Q Clear Time (g_c+I1), s	6.4	29.7	5.6	6.6	3.7	20.9	5.4	9.3				
Green Ext Time (p_c), s	0.0	9.5	0.0	0.5	0.0	12.2	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			29.3									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	1.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	2	6	112	18	2
Future Vol, veh/h	90	2	6	112	18	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	2	7	122	20	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	100	0	235	99
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	136	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1493	-	753	957
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1493	-	749	957
Mov Cap-2 Maneuver	-	-	-	-	749	-
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	886	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	766	-	-	1493	-
HCM Lane V/C Ratio	0.028	-	-	0.004	-
HCM Control Delay (s)	9.8	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection						
Int Delay, s/veh	2.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	74	78	10	18	40
Future Vol, veh/h	22	74	78	10	18	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	80	85	11	20	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	96	0	-	0	219	91
Stage 1	-	-	-	-	91	-
Stage 2	-	-	-	-	128	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1498	-	-	-	769	967
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	898	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1498	-	-	-	756	967
Mov Cap-2 Maneuver	-	-	-	-	756	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	898	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1498	-	-	-	890
HCM Lane V/C Ratio	0.016	-	-	-	0.071
HCM Control Delay (s)	7.4	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	61	55	403	395	28
Future Vol, veh/h	15	61	55	403	395	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	66	60	438	429	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	783	444	459	0	-	0
Stage 1	444	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	346	613	1100	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	327	613	1100	-	-	-
Mov Cap-2 Maneuver	444	-	-	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	694	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1100	-	444	613	-	-
HCM Lane V/C Ratio	0.054	-	0.037	0.108	-	-
HCM Control Delay (s)	8.5	-	13.4	11.6	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.4	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	40	18	0	11	26	0	5	3	0	9
Future Vol, veh/h	17	0	40	18	0	11	26	0	5	3	0	9
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	43	20	0	12	28	0	5	3	0	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	76	72	5	92	75	3	10	0	0	5	0	0
Stage 1	11	11	-	59	59	-	-	-	-	-	-	-
Stage 2	65	61	-	33	16	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	914	818	1078	892	815	1081	1610	-	-	1616	-	-
Stage 1	1010	886	-	953	846	-	-	-	-	-	-	-
Stage 2	946	844	-	983	882	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	891	802	1078	844	800	1081	1610	-	-	1616	-	-
Mov Cap-2 Maneuver	891	802	-	844	800	-	-	-	-	-	-	-
Stage 1	993	884	-	937	832	-	-	-	-	-	-	-
Stage 2	920	830	-	941	880	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	9	6.1	1.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	1014	921	1616	-	-
HCM Lane V/C Ratio	0.018	-	-	0.061	0.034	0.002	-	-
HCM Control Delay (s)	7.3	0	-	8.8	9	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	22	7	0	6	7	412	2	2	394	4
Future Vol, veh/h	13	0	22	7	0	6	7	412	2	2	394	4
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	-	-	-	0	-	0	100	-	-	100	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	0	24	8	0	7	8	448	2	2	428	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	672	898	214	683	-	225	432	0	0	450	0	0
Stage 1	432	432	-	465	-	-	-	-	-	-	-	-
Stage 2	240	466	-	218	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	342	278	791	335	0	778	1124	-	-	1107	-	-
Stage 1	572	581	-	547	0	-	-	-	-	-	-	-
Stage 2	742	561	-	764	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	337	275	791	323	-	778	1124	-	-	1107	-	-
Mov Cap-2 Maneuver	337	275	-	323	-	-	-	-	-	-	-	-
Stage 1	568	580	-	543	-	-	-	-	-	-	-	-
Stage 2	731	557	-	740	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.4	13.3	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1124	-	-	527	323	778	1107	-	-
HCM Lane V/C Ratio	0.007	-	-	0.072	0.024	0.008	0.002	-	-
HCM Control Delay (s)	8.2	-	-	12.4	16.4	9.7	8.3	-	-
HCM Lane LOS	A	-	-	B	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	2	449	2	1	444
Future Vol, veh/h	7	2	449	2	1	444
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	2	488	2	1	483

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	733	245	0	0	490	0
Stage 1	489	-	-	-	-	-
Stage 2	244	-	-	-	-	-
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	356	755	-	-	1070	-
Stage 1	582	-	-	-	-	-
Stage 2	774	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	356	755	-	-	1070	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	773	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	403	1070	-
HCM Lane V/C Ratio	-	-	0.024	0.001	-
HCM Control Delay (s)	-	-	14.2	8.4	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	215	261	29	169	112	340	711	77	137	782	246
Future Volume (veh/h)	278	215	261	29	169	112	340	711	77	137	782	246
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	302	272	259	32	184	122	370	773	84	149	850	267
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	717	608	94	237	157	325	1022	456	162	1010	451
Arrive On Green	0.18	0.38	0.38	0.03	0.23	0.23	0.09	0.29	0.29	0.09	0.28	0.28
Sat Flow, veh/h	1781	1870	1585	3456	1049	696	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	302	272	259	32	0	306	370	773	84	149	850	267
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1745	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	20.0	12.6	14.5	1.1	0.0	19.8	11.3	23.8	4.8	10.0	27.0	17.4
Cycle Q Clear(g_c), s	20.0	12.6	14.5	1.1	0.0	19.8	11.3	23.8	4.8	10.0	27.0	17.4
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	717	608	94	0	394	325	1022	456	162	1010	451
V/C Ratio(X)	0.92	0.38	0.43	0.34	0.00	0.78	1.14	0.76	0.18	0.92	0.84	0.59
Avail Cap(c_a), veh/h	384	717	608	144	0	394	325	1022	456	162	1010	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.28	0.28	0.28	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	26.7	27.3	57.3	0.0	43.6	54.3	38.9	32.1	54.1	40.4	37.0
Incr Delay (d2), s/veh	22.9	1.5	2.2	2.1	0.0	9.4	72.6	1.5	0.2	48.2	8.4	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	5.9	5.8	0.5	0.0	9.5	8.1	10.2	1.9	6.5	12.5	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	28.2	29.5	59.4	0.0	53.0	126.9	40.4	32.4	102.3	48.8	42.6
LnGrp LOS	E	C	C	E	A	D	F	D	C	F	D	D
Approach Vol, veh/h		833			338			1227			1266	
Approach Delay, s/veh		44.1			53.6			66.0			53.8	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	41.6	27.9	33.5	16.6	42.0	9.0	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 11	32.4	* 26	* 25	* 11	32.8	* 5	46.0
Max Q Clear Time (g_c+I1), s	13.3	29.0	22.0	21.8	12.0	25.8	3.1	16.5
Green Ext Time (p_c), s	0.0	3.0	0.2	0.6	0.0	5.3	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	55.6
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	310	222	0	0	1
Future Vol, veh/h	1	310	222	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	337	241	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	241	0	-	0	412	121
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	171	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1323	-	-	-	568	908
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	842	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1323	-	-	-	567	908
Mov Cap-2 Maneuver	-	-	-	-	567	-
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	842	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1323	-	-	-	908
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s)	7.7	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	283	30	10	202	21	6
Future Vol, veh/h	283	30	10	202	21	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	308	33	11	220	23	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	457	171
Stage 1	-	-	-	-	325	-
Stage 2	-	-	-	-	132	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1215	-	532	843
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	880	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1215	-	527	843
Mov Cap-2 Maneuver	-	-	-	-	527	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	872	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	575	-	-	1215	-
HCM Lane V/C Ratio	0.051	-	-	0.009	-
HCM Control Delay (s)	11.6	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	140	150	333	296	65
Future Volume (veh/h)	150	140	150	333	296	65
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	163	152	163	362	322	71
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	523	240	181	2359	1434	312
Arrive On Green	0.15	0.15	0.10	0.66	0.49	0.49
Sat Flow, veh/h	3456	1585	1781	3647	2996	631
Grp Volume(v), veh/h	163	152	163	362	195	198
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1757
Q Serve(g_s), s	2.5	5.3	5.3	2.2	3.7	3.8
Cycle Q Clear(g_c), s	2.5	5.3	5.3	2.2	3.7	3.8
Prop In Lane	1.00	1.00	1.00			0.36
Lane Grp Cap(c), veh/h	523	240	181	2359	878	868
V/C Ratio(X)	0.31	0.63	0.90	0.15	0.22	0.23
Avail Cap(c_a), veh/h	1760	807	181	2359	878	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.3	23.5	26.2	3.7	8.5	8.5
Incr Delay (d2), s/veh	0.5	3.9	38.7	0.1	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.3	4.0	0.5	1.3	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.8	27.4	64.8	3.8	9.1	9.1
LnGrp LOS	C	C	E	A	A	A
Approach Vol, veh/h	315			525	393	
Approach Delay, s/veh	25.0			22.8	9.1	
Approach LOS	C			C	A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		14.4	10.0	34.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		4.2		7.3	7.3	5.8
Green Ext Time (p_c), s		4.7		1.7	0.0	4.3

Intersection Summary			
HCM 6th Ctrl Delay			19.0
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	127	116	296	132	129	116	276	953	141	46	910	111
Future Volume (veh/h)	127	116	296	132	129	116	276	953	141	46	910	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	138	126	322	143	140	126	300	1036	153	50	989	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	165	655	555	164	277	249	331	1264	564	64	1051	469
Arrive On Green	0.09	0.35	0.35	0.05	0.30	0.30	0.10	0.36	0.36	0.07	0.59	0.59
Sat Flow, veh/h	1781	1870	1585	3456	907	816	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	138	126	322	143	0	266	300	1036	153	50	989	121
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1723	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	9.1	5.6	19.9	4.9	0.0	15.2	10.3	31.8	8.3	3.3	30.8	4.4
Cycle Q Clear(g_c), s	9.1	5.6	19.9	4.9	0.0	15.2	10.3	31.8	8.3	3.3	30.8	4.4
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	165	655	555	164	0	525	331	1264	564	64	1051	469
V/C Ratio(X)	0.84	0.19	0.58	0.87	0.00	0.51	0.91	0.82	0.27	0.78	0.94	0.26
Avail Cap(c_a), veh/h	260	655	555	164	0	525	331	1264	564	74	1051	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	53.5	27.2	31.8	56.8	0.0	34.3	53.7	35.1	27.6	55.2	23.5	18.2
Incr Delay (d2), s/veh	7.0	0.7	4.4	35.2	0.0	0.8	26.6	6.0	1.2	19.5	11.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.7	8.3	3.0	0.0	6.5	5.6	14.2	3.3	1.8	8.8	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.5	27.8	36.2	92.0	0.0	35.1	80.3	41.2	28.7	74.7	34.7	18.9
LnGrp LOS	E	C	D	F	A	D	F	D	C	E	C	B
Approach Vol, veh/h		586			409			1489			1160	
Approach Delay, s/veh		40.1			55.0			47.8			34.7	
Approach LOS		D			D			D			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.2	43.0	16.8	43.0	10.0	50.2	11.4	48.4				
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4				
Max Green Setting (Gmax), s	* 12	35.5	* 18	* 31	* 5	42.0	* 5.7	42.0				
Max Q Clear Time (g_c+I1), s	12.3	32.8	11.1	17.2	5.3	33.8	6.9	21.9				
Green Ext Time (p_c), s	0.0	2.4	0.1	1.3	0.0	7.1	0.0	1.8				
Intersection Summary												
HCM 6th Ctrl Delay			43.2									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	199	7	5	162	33	5
Future Vol, veh/h	199	7	5	162	33	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	216	8	5	176	36	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	224	0	406	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	186	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1345	-	601	820
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	846	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1345	-	599	820
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	843	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	621	-	-	1345	-
HCM Lane V/C Ratio	0.067	-	-	0.004	-
HCM Control Delay (s)	11.2	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection						
Int Delay, s/veh	2.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	79	144	115	40	10	33
Future Vol, veh/h	79	144	115	40	10	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	86	157	125	43	11	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	168	0	-	0	476	147
Stage 1	-	-	-	-	147	-
Stage 2	-	-	-	-	329	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1410	-	-	-	548	900
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1410	-	-	-	511	900
Mov Cap-2 Maneuver	-	-	-	-	511	-
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	729	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1410	-	-	-	765
HCM Lane V/C Ratio	0.061	-	-	-	0.061
HCM Control Delay (s)	7.7	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	117	125	492	398	25
Future Vol, veh/h	32	117	125	492	398	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	127	136	535	433	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	987	447	460	0	-	0
Stage 1	447	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	259	611	1099	-	-	-
Stage 1	643	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	227	611	1099	-	-	-
Mov Cap-2 Maneuver	357	-	-	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.2	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1099	-	357	611	-	-
HCM Lane V/C Ratio	0.124	-	0.097	0.208	-	-
HCM Control Delay (s)	8.7	-	16.2	12.4	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.3	0.8	-	-

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	20	0	31	10	0	6	98	0	18	11	0	31
Future Vol, veh/h	20	0	31	10	0	6	98	0	18	11	0	31
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	0	34	11	0	7	107	0	20	12	0	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	269	275	17	282	282	10	34	0	0	20	0	0
Stage 1	41	41	-	224	224	-	-	-	-	-	-	-
Stage 2	228	234	-	58	58	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	684	632	1062	670	627	1071	1578	-	-	1596	-	-
Stage 1	974	861	-	779	718	-	-	-	-	-	-	-
Stage 2	775	711	-	954	847	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	640	584	1062	611	579	1071	1578	-	-	1596	-	-
Mov Cap-2 Maneuver	640	584	-	611	579	-	-	-	-	-	-	-
Stage 1	907	854	-	725	668	-	-	-	-	-	-	-
Stage 2	717	662	-	916	840	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	10.1	6.3	1.9
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	844	728	1596	-	-
HCM Lane V/C Ratio	0.068	-	-	0.066	0.024	0.007	-	-
HCM Control Delay (s)	7.4	0	-	9.6	10.1	7.3	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	13	4	0	4	22	500	7	7	424	13
Future Vol, veh/h	7	0	13	4	0	4	22	500	7	7	424	13
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	-	-	-	0	-	0	0	-	-	100	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	14	4	0	4	24	543	8	8	461	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	797	1076	231	842	-	276	475	0	0	551	0	0
Stage 1	477	477	-	595	-	-	-	-	-	-	-	-
Stage 2	320	599	-	247	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	277	218	771	257	0	721	1083	-	-	1015	-	-
Stage 1	538	554	-	458	0	-	-	-	-	-	-	-
Stage 2	666	489	-	735	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	269	211	771	246	-	721	1083	-	-	1015	-	-
Mov Cap-2 Maneuver	269	211	-	246	-	-	-	-	-	-	-	-
Stage 1	526	550	-	448	-	-	-	-	-	-	-	-
Stage 2	647	478	-	716	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	15	0.3	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1083	-	-	466	246	721	1015	-	-
HCM Lane V/C Ratio	0.022	-	-	0.047	0.018	0.006	0.007	-	-
HCM Control Delay (s)	8.4	-	-	13.1	19.9	10	8.6	-	-
HCM Lane LOS	A	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	1	585	8	3	507
Future Vol, veh/h	5	1	585	8	3	507
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	1	636	9	3	551

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	923	323	0	0	645	0
Stage 1	641	-	-	-	-	-
Stage 2	282	-	-	-	-	-
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	269	673	-	-	936	-
Stage 1	487	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	268	673	-	-	936	-
Mov Cap-2 Maneuver	268	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	739	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	298	936	-
HCM Lane V/C Ratio	-	-	0.022	0.003	-
HCM Control Delay (s)	-	-	17.4	8.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

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INTERNATIONAL

Appendix I:
Horizon Year 2040
Volume Worksheets

Year 2040 Intersection Growth Factoring Worksheet

Intersection		Approach	Base Year	Model Year	Total Growth (%)	Growth Per Year (%)	Assumed Growth 2022 - 2040 (%)
1	SR-86 / Cruickshank Drive	NB	20,298	28,100	38.44%	1.83%	32.95%
		SB	20,298	28,100	38.44%	1.83%	32.95%
		EB(1)	NA	2,500			41.59%
		WB(2)	NA	15,800			41.59%
2	12th Street / Cruickshank Drive	NB(2)	-	-	-	-	0.00%
		SB(1)	NA	NA			41.59%
		EB	5,790	15,800	172.88%	7.20%	129.66%
		WB	5,790	15,800	172.88%	7.20%	129.66%
3	10th Street / Cruickshank Drive	NB(1)	NA	NA			41.59%
		SB	-	-	-	-	-
		EB	5,790	15,800	172.88%	7.20%	129.66%
		WB	5,580	15,800	183.15%	7.63%	137.37%
4	8th Street / Cruickshank Drive	NB	10,385	13,900	33.85%	1.61%	29.01%
		SB	10,385	13,900	33.85%	1.61%	29.01%
		EB	5,580	15,800	183.15%	7.63%	137.37%
		WB	-	-	-	-	-
5	SR-86 / Bradshaw Road	NB	29,961	35,100	17.15%	0.82%	14.70%
		SB	20,298	28,100	38.44%	1.83%	32.95%
		EB	15,496	15,600	0.67%	0.03%	0.58%
		WB	5,320	5,400	1.50%	0.07%	1.29%
6	12th Street / Bradshaw Road	NB(1)	NA	NA			41.59%
		SB	-	-	-	-	-
		EB	5,320	5,400	1.50%	0.07%	1.29%
		WB	5,320	5,400	1.50%	0.07%	1.29%
7	10th Street / Bradshaw Road	NB	-	-	-	-	-
		SB(1)	NA	NA			41.59%
		EB	5,320	5,400	1.50%	0.07%	1.29%
		WB	5,320	5,400	1.50%	0.07%	1.29%
8	8th Street / Bradshaw Road	NB	13,541	17,100	26.28%	1.25%	22.53%
		SB	10,385	13,900	33.85%	1.61%	29.01%
		EB	5,320	5,400	1.50%	0.07%	1.29%
		WB	-	-	-	-	-
9	10th Street / Project Driveway	NB	NA	NA			0.00%
		SB(1)	NA	NA			0.00%
		EB	NA	NA			0.00%
		WB(3)	DNE	DNE			
10	8th Street / Project Driveway	NB	10,385	13,900	33.85%	1.61%	29.01%
		SB	10,385	13,900	33.85%	1.61%	29.01%
		EB(3)	DNE	DNE			
		WB	-	-	-	-	-
11	8th Street / El Dorado Apt Dwy	NB	13,541	17,100	26.28%	1.25%	22.53%
		SB(1)	13,541	17,100	26.28%	1.25%	22.53%
		EB	-	-	-	-	-
		WB(2)	NA	NA			0.00%
					Avg:	2.31%	41.59%

Note: Includes Entering Volumes ONLY

If negative growth is shown (after manual adjustments), it is assumed to be zero.

Manually adjusted volumes are highlighted

(1) No volumes were available in model, therefore assumes average growth.

(2) Parcels adjacent to this movement are assumed to be built out to it's ultimate capacity, therefore assumes no growth

(3) No Project Driveway does not exist without Project. No volumes on this approach.

Year 2040 Intersection Growth Post Processing Worksheet

1. SR-86 / Cruickshank Drive

Movement	Opening Year 2022		Assumed Growth 2022 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	152	340	32.95%	202	452
NBT	526	709	32.95%	699	943
NBR	48	68	32.95%	64	90
SBL	127	134	32.95%	169	178
SBT	919	777	32.95%	1,222	1,033
SBR	205	246	32.95%	273	327
EBL	105	278	41.59%	149	394
EBT	85	212	41.59%	120	300
EBR	102	261	41.59%	144	370
WBL	26	23	41.59%	37	33
WBT	78	167	41.59%	110	236
WBR	79	110	41.59%	112	156

2. 12th Street / Cruickshank Drive

Movement	Opening Year 2022		Assumed Growth 2022 - 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	5	3	0.00%	5	3
NBT	0	0	0.00%	0	0
NBR	3	2	0.00%	3	2
SBL	0	0	41.59%	0	0
SBT	0	0	41.59%	0	0
SBR	0	1	41.59%	0	1
EBL	0	1	129.66%	0	2
EBT	141	293	129.66%	324	673
EBR	0	0	129.66%	0	0
WBL	0	0	129.66%	0	0
WBT	184	212	129.66%	423	487
WBR	0	0	129.66%	0	0

3. 10th Street / Cruickshank Drive

Movement	Opening Year 2022		Assumed Growth 2022 - 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	9	17	41.59%	13	24
NBT	0	0	41.59%	0	0
NBR	7	4	41.59%	10	6
SBL	0	0	-	0	0
SBT	0	0	-	0	0
SBR	0	0	-	0	0
EBL	0	0	129.66%	0	0
EBT	138	274	129.66%	317	629
EBR	6	22	129.66%	14	51
WBL	3	10	137.37%	7	24
WBT	175	196	137.37%	415	465
WBR	0	0	137.37%	0	0

4. 8th Street / Cruickshank Drive

Movement	Opening Year 2022		Assumed Growth 2022 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	112	144	29.01%	144	186
NBT	271	331	29.01%	350	427
NBR	0	0	29.01%	0	0
SBL	0	0	29.01%	0	0
SBT	322	293	29.01%	415	378
SBR	64	62	29.01%	83	80
EBL	75	148	137.37%	178	351
EBT	0	0	137.37%	0	0
EBR	72	131	137.37%	171	311
WBL	0	0	-	0	0
WBT	0	0	-	0	0
WBR	0	0	-	0	0

5. SR-86 / Bradshaw Road

Movement	Opening Year 2022		Assumed Growth 2022 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	119	276	14.70%	136	317
NBT	652	944	14.70%	748	1,083
NBR	62	128	14.70%	71	147
SBL	23	43	32.95%	31	57
SBT	965	908	32.95%	1,283	1,207
SBR	60	111	32.95%	80	148
EBL	50	127	0.58%	50	128
EBT	52	113	0.58%	52	114
EBR	124	296	0.58%	125	298
WBL	77	125	1.29%	78	127
WBT	51	127	1.29%	52	129
WBR	33	114	1.29%	33	115

6. 12th Street / Bradshaw Road

Movement	Opening Year 2022		Assumed Growth 2022 - 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	18	33	41.59%	25	47
NBT	0	0	41.59%	0	0
NBR	2	4	41.59%	3	6
SBL	0	0	-	0	0
SBT	17	8	-	0	0
SBR	37	21	-	0	0
EBL	0	0	1.29%	0	0
EBT	84	178	1.29%	85	180
EBR	2	7	1.29%	2	7
WBL	5	4	1.29%	5	4
WBT	91	150	1.29%	92	152
WBR	12	16	1.29%	12	16

7. 10th Street / Bradshaw Road

Movement	Opening Year 2022		Assumed Growth 2022 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	0	0	-	0	0
NBT	0	0	-	0	0
NBR	0	0	-	0	0
SBL	10	5	41.59%	14	7
SBT	0	0	41.59%	0	0
SBR	30	27	41.59%	42	38
EBL	19	70	1.29%	19	71
EBT	70	131	1.29%	71	133
EBR	0	0	1.29%	0	0
WBL	0	0	1.29%	0	0
WBT	65	108	1.29%	66	109
WBR	8	32	1.29%	8	32

8. 8th Street / Bradshaw Road

Movement	Opening Year 2022		Assumed Growth 2022 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	53	117	22.53%	65	143
NBT	400	483	22.53%	490	592
NBR	0	0	22.53%	0	0
SBL	0	0	29.01%	0	0
SBT	385	392	29.01%	497	506
SBR	15	18	29.01%	19	23
EBL	11	19	1.29%	11	19
EBT	0	0	1.29%	0	0
EBR	53	112	1.29%	54	113
WBL	0	0	-	0	0
WBT	0	0	-	0	0
WBR	0	0	-	0	0

9. 10th Street / Project Driveway

Movement	Opening Year 2022		Assumed Growth 2022 - 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	26	98	0.00%	26	98
NBT	0	0	0.00%	0	0
NBR	0	0	0.00%	0	0
SBL	0	0	0.00%	0	0
SBT	0	0	0.00%	0	0
SBR	9	31	0.00%	9	31
EBL	17	20	0.00%	17	20
EBT	0	0	0.00%	0	0
EBR	40	31	0.00%	40	31
WBL	0	0	0.00%	0	0
WBT	0	0	0.00%	0	0
WBR	0	0	0.00%	0	0

10. 8th Street / Project Driveway

Movement	Opening Year 2022		Assumed Growth 2022 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	0	0	29.01%	0	0
NBT	412	500	29.01%	532	645
NBR	0	0	29.01%	0	0
SBL	0	0	29.01%	0	0
SBT	394	424	29.01%	508	547
SBR	0	0	29.01%	0	0
EBL	0	0	0.00%	0	0
EBT	0	0	0.00%	0	0
EBR	0	0	0.00%	0	0
WBL	0	0	-	0	0
WBT	0	0	-	0	0
WBR	0	0	-	0	0

11. 8th Street / El Dorado Apt Dwy

Movement	Opening Year 2022		Assumed Growth 2022 - 2040 (%)	Year 2040 Without Project	
	AM	PM		AM	PM
NBL	0	0	22.53%	0	0
NBT	444	567	22.53%	544	695
NBR	2	8	22.53%	2	10
SBL	1	3	22.53%	1	4
SBT	426	497	22.53%	522	609
SBR	0	0	22.53%	0	0
EBL	0	0	-	0	0
EBT	0	0	-	0	0
EBR	0	0	-	0	0
WBL	7	5	0.00%	7	5
WBT	0	0	0.00%	0	0
WBR	2	1	0.00%	2	1

Note: Volumes in RED were manually adjusted

Appendix J:
Horizon Year 2040 Without Project HCM Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	120	144	37	110	112	202	699	64	169	1222	273
Future Volume (veh/h)	149	120	144	37	110	112	202	699	64	169	1222	273
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	146	139	39	116	118	213	736	67	178	1286	287
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	637	540	98	227	231	230	1171	522	203	1339	597
Arrive On Green	0.10	0.34	0.34	0.03	0.27	0.27	0.13	0.66	0.66	0.11	0.38	0.38
Sat Flow, veh/h	1781	1870	1585	3456	850	865	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	157	146	139	39	0	234	213	736	67	178	1286	287
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1715	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.7	7.5	8.6	1.5	0.0	15.6	8.2	16.3	2.1	13.3	47.7	18.6
Cycle Q Clear(g_c), s	11.7	7.5	8.6	1.5	0.0	15.6	8.2	16.3	2.1	13.3	47.7	18.6
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	637	540	98	0	458	230	1171	522	203	1339	597
V/C Ratio(X)	0.86	0.23	0.26	0.40	0.00	0.51	0.92	0.63	0.13	0.88	0.96	0.48
Avail Cap(c_a), veh/h	274	637	540	128	0	458	230	1171	522	235	1339	597
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.7	31.8	32.2	64.4	0.0	42.0	58.2	18.2	15.8	58.9	41.1	32.0
Incr Delay (d2), s/veh	11.2	0.8	1.2	2.6	0.0	1.0	34.7	2.2	0.4	26.6	16.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	3.6	3.5	0.7	0.0	6.8	4.4	4.9	0.8	7.4	23.1	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	32.7	33.3	67.0	0.0	42.9	92.8	20.4	16.2	85.5	57.9	34.8
LnGrp LOS	E	C	C	E	A	D	F	C	B	F	E	C
Approach Vol, veh/h		442			273			1016			1751	
Approach Delay, s/veh		46.4			46.4			35.3			56.9	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	58.4	19.5	42.5	21.1	52.0	9.5	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 9	49.7	* 21	* 31	* 18	40.9	* 5	46.0
Max Q Clear Time (g_c+I1), s	10.2	49.7	13.7	17.6	15.3	18.3	3.5	10.6
Green Ext Time (p_c), s	0.0	0.0	0.1	1.1	0.1	12.9	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	48.5
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	324	423	0	0	1
Future Vol, veh/h	0	324	423	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	352	460	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	460	0	-	0	636	230
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	176	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1097	-	-	-	410	772
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	837	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1097	-	-	-	410	772
Mov Cap-2 Maneuver	-	-	-	-	410	-
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	837	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1097	-	-	-	772
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.4					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	317	14	7	415	13	10
Future Vol, veh/h	317	14	7	415	13	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	345	15	8	451	14	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	360	0	595	180
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1195	-	436	832
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	776	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1195	-	433	832
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	771	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	547	-	-	1195	-
HCM Lane V/C Ratio	0.046	-	-	0.006	-
HCM Control Delay (s)	11.9	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	178	171	144	350	415	83
Future Volume (veh/h)	178	171	144	350	415	83
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	193	186	157	380	451	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	606	278	176	2292	1419	281
Arrive On Green	0.18	0.18	0.10	0.64	0.48	0.48
Sat Flow, veh/h	3456	1585	1781	3647	3049	586
Grp Volume(v), veh/h	193	186	157	380	270	271
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1765
Q Serve(g_s), s	3.0	6.6	5.3	2.6	5.6	5.7
Cycle Q Clear(g_c), s	3.0	6.6	5.3	2.6	5.6	5.7
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	606	278	176	2292	853	847
V/C Ratio(X)	0.32	0.67	0.89	0.17	0.32	0.32
Avail Cap(c_a), veh/h	1710	784	176	2292	853	847
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	23.4	27.0	4.3	9.7	9.7
Incr Delay (d2), s/veh	0.4	3.9	37.7	0.2	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.3	3.9	0.7	2.0	2.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.3	27.3	64.7	4.4	10.6	10.7
LnGrp LOS	C	C	E	A	B	B
Approach Vol, veh/h	379			537	541	
Approach Delay, s/veh	24.7			22.0	10.7	
Approach LOS	C			C	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		16.1	10.0	34.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		4.6		8.6	7.3	7.7
Green Ext Time (p_c), s		5.0		2.0	0.0	5.9

Intersection Summary			
HCM 6th Ctrl Delay			18.5
HCM 6th LOS			B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	52	125	78	52	33	136	748	71	31	1283	80
Future Volume (veh/h)	50	52	125	78	52	33	136	748	71	31	1283	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	54	57	136	85	57	36	148	813	77	34	1395	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	70	582	493	128	331	209	174	1556	694	48	1471	656
Arrive On Green	0.04	0.31	0.31	0.04	0.31	0.31	0.05	0.44	0.44	0.04	0.55	0.55
Sat Flow, veh/h	1781	1870	1585	3456	1072	677	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	54	57	136	85	0	93	148	813	77	34	1395	87
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1749	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	4.1	2.9	8.7	3.3	0.0	5.2	5.7	22.5	3.9	2.6	49.8	3.6
Cycle Q Clear(g_c), s	4.1	2.9	8.7	3.3	0.0	5.2	5.7	22.5	3.9	2.6	49.8	3.6
Prop In Lane	1.00		1.00	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	70	582	493	128	0	541	174	1556	694	48	1471	656
V/C Ratio(X)	0.78	0.10	0.28	0.66	0.00	0.17	0.85	0.52	0.11	0.72	0.95	0.13
Avail Cap(c_a), veh/h	128	582	493	128	0	541	174	1556	694	91	1471	656
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.31	0.31	0.31
Uniform Delay (d), s/veh	64.3	33.0	35.0	64.2	0.0	34.0	63.6	27.7	22.4	64.6	29.0	18.6
Incr Delay (d2), s/veh	6.8	0.3	1.4	10.0	0.0	0.1	29.6	1.3	0.3	2.3	5.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.4	3.6	1.6	0.0	2.3	3.2	9.5	1.5	1.2	18.8	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.1	33.4	36.4	74.1	0.0	34.2	93.2	28.9	22.8	66.9	34.5	18.7
LnGrp LOS	E	C	D	E	A	C	F	C	C	E	C	B
Approach Vol, veh/h		247			178			1038			1516	
Approach Delay, s/veh		43.3			53.3			37.6			34.4	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	63.4	11.0	48.1	9.3	66.6	10.7	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 6.8	55.9	* 9.7	* 38	* 6.9	55.8	* 5	42.0
Max Q Clear Time (g_c+I1), s	7.7	51.8	6.1	7.2	4.6	24.5	5.3	10.7
Green Ext Time (p_c), s	0.0	3.9	0.0	0.5	0.0	17.6	0.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	37.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	85	2	5	92	25	3
Future Vol, veh/h	85	2	5	92	25	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	2	5	100	27	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	94	0	203	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	110	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1500	-	786	964
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	915	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1500	-	783	964
Mov Cap-2 Maneuver	-	-	-	-	783	-
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	911	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	799	-	-	1500	-
HCM Lane V/C Ratio	0.038	-	-	0.004	-
HCM Control Delay (s)	9.7	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	71	66	8	14	42
Future Vol, veh/h	19	71	66	8	14	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	77	72	9	15	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	196	77
Stage 1	-	-	-	-	77	-
Stage 2	-	-	-	-	119	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1517	-	-	-	793	984
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	906	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1517	-	-	-	782	984
Mov Cap-2 Maneuver	-	-	-	-	782	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	906	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1517	-	-	-	924
HCM Lane V/C Ratio	0.014	-	-	-	0.066
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	54	65	490	497	19
Future Vol, veh/h	11	54	65	490	497	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	59	71	533	540	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	960	551	561	0	-	0
Stage 1	551	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	269	533	1008	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	250	533	1008	-	-	-
Mov Cap-2 Maneuver	379	-	-	-	-	-
Stage 1	536	-	-	-	-	-
Stage 2	640	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1008	-	379	533	-	-
HCM Lane V/C Ratio	0.07	-	0.032	0.11	-	-
HCM Control Delay (s)	8.8	-	14.8	12.6	-	-
HCM Lane LOS	A	-	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.4	-	-

Intersection												
Int Delay, s/veh	2.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	40	0	0	0	26	0	0	0	0	9
Future Vol, veh/h	17	0	40	0	0	0	26	0	0	0	0	9
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	43	0	0	0	28	0	0	0	0	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	61	61	5	83	66	0	10	0	0	0	0	0
Stage 1	5	5	-	56	56	-	-	-	-	-	-	-
Stage 2	56	56	-	27	10	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	934	830	1078	904	825	-	1610	-	-	-	-	-
Stage 1	1017	892	-	956	848	-	-	-	-	-	-	-
Stage 2	956	848	-	990	887	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	816	1078	856	811	-	1610	-	-	-	-	-
Mov Cap-2 Maneuver	-	816	-	856	811	-	-	-	-	-	-	-
Stage 1	1000	892	-	940	834	-	-	-	-	-	-	-
Stage 2	940	834	-	950	887	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		0	7.3	0
HCM LOS	-	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.018	-	-	-	-	-	-	-
HCM Control Delay (s)	7.3	0	-	-	0	0	-	-
HCM Lane LOS	A	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-	-	-

Intersection						
Int Delay, s/veh	0.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	18	532	6	6	508
Future Vol, veh/h	21	18	532	6	6	508
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	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	20	578	7	7	552

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	872	293	0	0	585	0
Stage 1	582	-	-	-	-	-
Stage 2	290	-	-	-	-	-
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	290	703	-	-	986	-
Stage 1	522	-	-	-	-	-
Stage 2	734	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	288	703	-	-	986	-
Mov Cap-2 Maneuver	402	-	-	-	-	-
Stage 1	522	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	402	703	986	-
HCM Lane V/C Ratio	-	-	0.057	0.028	0.007	-
HCM Control Delay (s)	-	-	14.5	10.3	8.7	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	0	-

Intersection						
Int Delay, s/veh	1.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	15	544	15	5	522
Future Vol, veh/h	52	15	544	15	5	522
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	16	591	16	5	567

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	893	304	0	0	607	0
Stage 1	599	-	-	-	-	-
Stage 2	294	-	-	-	-	-
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	281	692	-	-	967	-
Stage 1	511	-	-	-	-	-
Stage 2	730	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	280	692	-	-	967	-
Mov Cap-2 Maneuver	280	-	-	-	-	-
Stage 1	511	-	-	-	-	-
Stage 2	726	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	323	967	-
HCM Lane V/C Ratio	-	-	0.225	0.006	-
HCM Control Delay (s)	-	-	19.4	8.7	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.8	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	300	370	33	236	156	452	943	90	178	1028	327
Future Volume (veh/h)	394	300	370	33	236	156	452	943	90	178	1028	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	415	371	352	35	248	164	476	993	95	187	1082	344
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	397	741	628	90	209	138	436	1330	575	198	1274	551
Arrive On Green	0.22	0.40	0.40	0.03	0.20	0.20	0.13	0.36	0.36	0.11	0.35	0.35
Sat Flow, veh/h	1781	1870	1585	3456	1051	695	3456	3666	1585	1781	3666	1585
Grp Volume(v), veh/h	415	371	352	35	0	412	476	993	95	187	1082	344
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1745	1728	1833	1585	1781	1833	1585
Q Serve(g_s), s	32.3	21.7	25.0	1.4	0.0	28.9	18.3	34.3	5.9	15.1	39.6	26.2
Cycle Q Clear(g_c), s	32.3	21.7	25.0	1.4	0.0	28.9	18.3	34.3	5.9	15.1	39.6	26.2
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	397	741	628	90	0	348	436	1330	575	198	1274	551
V/C Ratio(X)	1.05	0.50	0.56	0.39	0.00	1.18	1.09	0.75	0.17	0.95	0.85	0.62
Avail Cap(c_a), veh/h	397	741	628	143	0	348	436	1330	575	198	1274	551
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.3	33.0	34.0	69.5	0.0	58.1	63.4	40.4	31.3	64.0	43.8	39.4
Incr Delay (d2), s/veh	57.7	2.4	3.6	2.7	0.0	108.4	61.6	2.4	0.4	48.5	7.2	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.9	10.4	10.3	0.7	0.0	23.2	11.6	15.5	0.1	9.4	18.7	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	114.0	35.4	37.6	72.2	0.0	166.5	124.9	42.8	31.7	112.5	51.0	44.7
LnGrp LOS	F	D	D	E	A	F	F	D	C	F	D	D
Approach Vol, veh/h		1138			447			1564			1613	
Approach Delay, s/veh		64.7			159.1			67.1			56.8	
Approach LOS		E			F			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	58.2	38.0	35.3	21.8	60.4	9.5	63.8
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 18	40.5	* 32	* 29	* 16	42.7	* 6	54.9
Max Q Clear Time (g_c+I1), s	20.3	41.6	34.3	30.9	17.1	36.3	3.4	27.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	5.4	0.0	3.8

Intersection Summary	
HCM 6th Ctrl Delay	71.7
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	673	487	0	0	1
Future Vol, veh/h	2	673	487	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	732	529	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	529	0	-	0	899	265
Stage 1	-	-	-	-	529	-
Stage 2	-	-	-	-	370	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1034	-	-	-	279	733
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1034	-	-	-	278	733
Mov Cap-2 Maneuver	-	-	-	-	278	-
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	669	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1034	-	-	-	733
HCM Lane V/C Ratio	0.002	-	-	-	0.001
HCM Control Delay (s)	8.5	-	-	-	9.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	629	51	24	465	24	6
Future Vol, veh/h	629	51	24	465	24	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	684	55	26	505	26	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	739	0	1017	370
Stage 1	-	-	-	-	712	-
Stage 2	-	-	-	-	305	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	863	-	234	627
Stage 1	-	-	-	-	447	-
Stage 2	-	-	-	-	721	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	863	-	227	627
Mov Cap-2 Maneuver	-	-	-	-	227	-
Stage 1	-	-	-	-	447	-
Stage 2	-	-	-	-	699	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	20.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	260	-	-	863	-
HCM Lane V/C Ratio	0.125	-	-	0.03	-
HCM Control Delay (s)	20.8	-	-	9.3	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	114	298	127	129	115	317	1083	147	57	1202	148
Future Volume (veh/h)	128	114	298	127	129	115	317	1083	147	57	1202	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	139	124	324	138	140	125	334	1140	155	60	1265	156
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	161	542	459	138	218	195	357	1608	717	76	1385	618
Arrive On Green	0.09	0.29	0.29	0.04	0.24	0.24	0.11	0.45	0.45	0.09	0.78	0.78
Sat Flow, veh/h	1781	1870	1585	3384	911	813	3384	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	139	124	324	138	0	265	334	1140	155	60	1265	156
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1692	0	1724	1692	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.2	7.3	26.5	5.9	0.0	20.0	14.2	37.5	8.6	4.8	39.5	3.9
Cycle Q Clear(g_c), s	11.2	7.3	26.5	5.9	0.0	20.0	14.2	37.5	8.6	4.8	39.5	3.9
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	161	542	459	138	0	413	357	1608	717	76	1385	618
V/C Ratio(X)	0.86	0.23	0.71	1.00	0.00	0.64	0.94	0.71	0.22	0.79	0.91	0.25
Avail Cap(c_a), veh/h	174	542	459	138	0	413	357	1608	717	93	1385	618
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.32	0.32	0.32
Uniform Delay (d), s/veh	65.0	39.2	46.0	69.6	0.0	49.5	64.4	32.0	24.1	65.7	14.1	10.2
Incr Delay (d2), s/veh	29.5	1.0	8.8	77.2	0.0	3.3	31.1	2.7	0.7	8.9	4.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	3.6	11.6	4.0	0.0	9.1	7.5	16.1	3.4	2.3	6.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.6	40.2	54.8	146.8	0.0	52.8	95.4	34.7	24.8	74.6	18.1	10.5
LnGrp LOS	F	D	D	F	A	D	F	C	C	E	B	B
Approach Vol, veh/h		587			403			1629			1481	
Approach Delay, s/veh		61.1			85.0			46.2			19.6	
Approach LOS		E			F			D			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	64.0	18.8	41.2	11.9	73.1	11.6	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 15	56.5	* 14	* 34	* 7.6	64.2	* 5.9	42.0
Max Q Clear Time (g_c+I1), s	16.2	41.5	13.2	22.0	6.8	39.5	7.9	28.5
Green Ext Time (p_c), s	0.0	13.4	0.0	1.2	0.0	20.0	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	42.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	351	311	186	427	378	80
Future Volume (veh/h)	351	311	186	427	378	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	382	338	202	464	411	87
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	912	418	241	2140	1222	256
Arrive On Green	0.26	0.26	0.14	0.60	0.42	0.42
Sat Flow, veh/h	3456	1585	1781	3647	3017	614
Grp Volume(v), veh/h	382	338	202	464	248	250
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1760
Q Serve(g_s), s	7.5	16.3	9.0	4.9	7.7	7.8
Cycle Q Clear(g_c), s	7.5	16.3	9.0	4.9	7.7	7.8
Prop In Lane	1.00	1.00	1.00			0.35
Lane Grp Cap(c), veh/h	912	418	241	2140	743	736
V/C Ratio(X)	0.42	0.81	0.84	0.22	0.33	0.34
Avail Cap(c_a), veh/h	1272	583	350	2140	743	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	28.1	34.4	7.4	16.1	16.1
Incr Delay (d2), s/veh	0.4	7.0	7.8	0.2	1.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.8	4.3	1.6	3.2	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.3	35.1	42.2	7.6	17.3	17.3
LnGrp LOS	C	D	D	A	B	B
Approach Vol, veh/h	720			666	498	
Approach Delay, s/veh	29.9			18.1	17.3	
Approach LOS	C			B	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		54.5		27.0	15.0	39.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		49.1		30.0	16.0	29.1
Max Q Clear Time (g_c+I1), s		6.9		18.3	11.0	9.8
Green Ext Time (p_c), s		6.5		3.3	0.1	5.1
Intersection Summary						
HCM 6th Ctrl Delay			22.4			
HCM 6th LOS			C			

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	180	7	4	152	47	6
Future Vol, veh/h	180	7	4	152	47	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	196	8	4	165	51	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	204	0	373	200
Stage 1	-	-	-	-	200	-
Stage 2	-	-	-	-	173	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1368	-	628	841
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	857	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1368	-	626	841
Mov Cap-2 Maneuver	-	-	-	-	626	-
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	854	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	645	-	-	1368	-
HCM Lane V/C Ratio	0.089	-	-	0.003	-
HCM Control Delay (s)	11.1	-	-	7.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	71	133	108	32	7	38
Future Vol, veh/h	71	133	108	32	7	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	145	117	35	8	41

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	152	0	-	0	434	135
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	299	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1429	-	-	-	579	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1429	-	-	-	545	914
Mov Cap-2 Maneuver	-	-	-	-	545	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	752	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	827
HCM Lane V/C Ratio	0.054	-	-	-	0.059
HCM Control Delay (s)	7.7	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.3					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	113	143	592	506	23
Future Vol, veh/h	19	113	143	592	506	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	123	155	643	550	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1195	563	575	0	-	0
Stage 1	563	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	192	525	996	-	-	-
Stage 1	569	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	162	525	996	-	-	-
Mov Cap-2 Maneuver	296	-	-	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	493	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.5	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	996	-	296	525	-	-
HCM Lane V/C Ratio	0.156	-	0.07	0.234	-	-
HCM Control Delay (s)	9.3	-	18.1	13.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.6	-	0.2	0.9	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	31	0	0	0	98	0	0	0	0	31
Future Vol, veh/h	20	0	31	0	0	0	98	0	0	0	0	31
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	0	34	0	0	0	107	0	0	0	0	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	231	231	17	248	248	0	34	0	0	0	0	0
Stage 1	17	17	-	214	214	-	-	-	-	-	-	-
Stage 2	214	214	-	34	34	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	724	669	1062	706	655	-	1578	-	-	-	-	-
Stage 1	1002	881	-	788	725	-	-	-	-	-	-	-
Stage 2	788	725	-	982	867	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	624	1062	648	610	-	1578	-	-	-	-	-
Mov Cap-2 Maneuver	-	624	-	648	610	-	-	-	-	-	-	-
Stage 1	934	881	-	734	676	-	-	-	-	-	-	-
Stage 2	734	676	-	951	867	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		0	7.4	0
HCM LOS	-	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	-	-	-	-	-
HCM Lane V/C Ratio	0.068	-	-	-	-	-	-	-
HCM Control Delay (s)	7.4	0	-	-	0	0	-	-
HCM Lane LOS	A	A	-	-	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	12	645	21	21	547
Future Vol, veh/h	12	12	645	21	21	547
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	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	13	701	23	23	595

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1057	362	0	0	724	0
Stage 1	713	-	-	-	-	-
Stage 2	344	-	-	-	-	-
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	220	635	-	-	874	-
Stage 1	447	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	214	635	-	-	874	-
Mov Cap-2 Maneuver	336	-	-	-	-	-
Stage 1	447	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.5	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	336	635	874	-
HCM Lane V/C Ratio	-	-	0.039	0.021	0.026	-
HCM Control Delay (s)	-	-	16.1	10.8	9.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.1	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	8	695	54	17	609
Future Vol, veh/h	31	8	695	54	17	609
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	9	755	59	18	662

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1152	407	0	0	814	0
Stage 1	785	-	-	-	-	-
Stage 2	367	-	-	-	-	-
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	191	593	-	-	809	-
Stage 1	410	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	187	593	-	-	809	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	656	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	25.5		0		0.3	
HCM LOS	D					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	218	809	-
HCM Lane V/C Ratio	-	-	0.194	0.023	-
HCM Control Delay (s)	-	-	25.5	9.6	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Appendix K:
Horizon Year 2040 + Project
HCM Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	121	144	47	113	115	202	702	67	170	1225	273
Future Volume (veh/h)	149	121	144	47	113	115	202	702	67	170	1225	273
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	157	146	140	49	119	121	213	739	71	179	1289	287
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	642	544	108	232	235	230	1145	511	204	1316	587
Arrive On Green	0.10	0.34	0.34	0.03	0.27	0.27	0.13	0.64	0.64	0.11	0.37	0.37
Sat Flow, veh/h	1781	1870	1585	3456	850	865	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	157	146	140	49	0	240	213	739	71	179	1289	287
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1715	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.6	7.5	8.5	1.9	0.0	15.9	8.2	17.0	2.3	13.3	48.0	18.7
Cycle Q Clear(g_c), s	11.6	7.5	8.5	1.9	0.0	15.9	8.2	17.0	2.3	13.3	48.0	18.7
Prop In Lane	1.00		1.00	1.00		0.50	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	182	642	544	108	0	467	230	1145	511	204	1316	587
V/C Ratio(X)	0.86	0.23	0.26	0.45	0.00	0.51	0.93	0.65	0.14	0.88	0.98	0.49
Avail Cap(c_a), veh/h	275	642	544	129	0	467	230	1145	511	235	1316	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.2	31.3	31.7	63.8	0.0	41.3	57.8	19.2	16.6	58.4	41.7	32.5
Incr Delay (d2), s/veh	11.0	0.8	1.1	2.9	0.0	1.0	36.1	2.5	0.5	26.7	20.4	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	3.6	3.5	0.9	0.0	6.9	4.4	5.1	0.9	7.4	23.8	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.2	32.2	32.8	66.7	0.0	42.2	93.9	21.6	17.1	85.1	62.1	35.4
LnGrp LOS	E	C	C	E	A	D	F	C	B	F	E	D
Approach Vol, veh/h		443			289			1023			1755	
Approach Delay, s/veh		45.9			46.4			36.4			60.1	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	57.1	19.4	42.9	21.0	50.7	9.9	52.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 8.9	48.8	* 21	* 31	* 18	40.0	* 5	46.0
Max Q Clear Time (g_c+I1), s	10.2	50.0	13.6	17.9	15.3	19.0	3.9	10.5
Green Ext Time (p_c), s	0.0	0.0	0.1	1.1	0.1	12.4	0.0	1.3

Intersection Summary			
HCM 6th Ctrl Delay			50.2
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	329	440	0	0	1
Future Vol, veh/h	0	329	440	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	358	478	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	478	0	-	0	657	239
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1081	-	-	-	398	762
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	834	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1081	-	-	-	398	762
Mov Cap-2 Maneuver	-	-	-	-	398	-
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	834	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1081	-	-	-	762
HCM Lane V/C Ratio	-	-	-	-	0.001
HCM Control Delay (s)	0	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.6					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑↑	Y	
Traffic Vol, veh/h	320	16	7	425	21	13
Future Vol, veh/h	320	16	7	425	21	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	348	17	8	462	23	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	365	0	604	183
Stage 1	-	-	-	-	357	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1190	-	430	828
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	771	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1190	-	427	828
Mov Cap-2 Maneuver	-	-	-	-	427	-
Stage 1	-	-	-	-	679	-
Stage 2	-	-	-	-	766	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	524	-	-	1190	-
HCM Lane V/C Ratio	0.071	-	-	0.006	-
HCM Control Delay (s)	12.4	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	181	174	154	353	416	84
Future Volume (veh/h)	181	174	154	353	416	84
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	191	183	162	372	438	88
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	599	275	177	2297	1420	283
Arrive On Green	0.17	0.17	0.10	0.65	0.48	0.48
Sat Flow, veh/h	3456	1585	1781	3647	3046	589
Grp Volume(v), veh/h	191	183	162	372	262	264
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1764
Q Serve(g_s), s	2.9	6.5	5.5	2.5	5.4	5.5
Cycle Q Clear(g_c), s	2.9	6.5	5.5	2.5	5.4	5.5
Prop In Lane	1.00	1.00	1.00			0.33
Lane Grp Cap(c), veh/h	599	275	177	2297	855	849
V/C Ratio(X)	0.32	0.67	0.92	0.16	0.31	0.31
Avail Cap(c_a), veh/h	1714	786	177	2297	855	849
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.9	23.4	27.0	4.2	9.6	9.6
Incr Delay (d2), s/veh	0.4	3.9	43.8	0.2	0.9	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.9	4.3	0.6	1.9	2.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.3	27.3	70.8	4.4	10.5	10.5
LnGrp LOS	C	C	E	A	B	B
Approach Vol, veh/h	374			534	526	
Approach Delay, s/veh	24.7			24.5	10.5	
Approach LOS	C			C	B	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.5		16.0	10.0	34.5
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		39.1		30.0	6.0	29.1
Max Q Clear Time (g_c+I1), s		4.5		8.5	7.5	7.5
Green Ext Time (p_c), s		4.9		2.0	0.0	5.7
Intersection Summary						
HCM 6th Ctrl Delay			19.4			
HCM 6th LOS			B			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	53	125	91	55	36	136	751	75	32	1293	80
Future Volume (veh/h)	50	53	125	91	55	36	136	751	75	32	1293	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	56	132	96	58	38	143	791	79	34	1361	84
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	68	586	497	143	334	219	193	1608	681	48	1499	635
Arrive On Green	0.04	0.31	0.31	0.04	0.32	0.32	0.06	0.43	0.43	0.03	0.40	0.40
Sat Flow, veh/h	1781	1870	1585	3456	1055	691	3456	3741	1585	1781	3741	1585
Grp Volume(v), veh/h	53	56	132	96	0	96	143	791	79	34	1361	84
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1746	1728	1870	1585	1781	1870	1585
Q Serve(g_s), s	4.0	2.8	8.4	3.7	0.0	5.3	5.5	20.5	4.0	2.5	45.9	4.5
Cycle Q Clear(g_c), s	4.0	2.8	8.4	3.7	0.0	5.3	5.5	20.5	4.0	2.5	45.9	4.5
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	68	586	497	143	0	552	193	1608	681	48	1499	635
V/C Ratio(X)	0.77	0.10	0.27	0.67	0.00	0.17	0.74	0.49	0.12	0.71	0.91	0.13
Avail Cap(c_a), veh/h	217	586	497	178	0	552	266	1608	681	90	1499	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.31	0.31	0.31
Uniform Delay (d), s/veh	63.8	32.6	34.5	63.3	0.0	33.1	62.3	27.6	22.9	64.7	37.8	25.4
Incr Delay (d2), s/veh	6.8	0.3	1.3	3.9	0.0	0.1	3.9	1.1	0.3	2.3	3.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.4	3.4	1.7	0.0	2.3	2.5	9.1	1.6	1.2	20.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.6	32.9	35.8	67.2	0.0	33.3	66.2	28.7	23.3	67.0	41.2	25.5
LnGrp LOS	E	C	D	E	A	C	E	C	C	E	D	C
Approach Vol, veh/h		241			192			1013			1479	
Approach Delay, s/veh		42.8			50.3			33.6			40.9	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	61.2	10.8	48.8	9.3	65.1	11.2	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 10	49.5	* 16	* 33	* 6.8	53.0	* 6.9	42.0
Max Q Clear Time (g_c+I1), s	7.5	47.9	6.0	7.3	4.5	22.5	5.7	10.4
Green Ext Time (p_c), s	0.1	1.5	0.0	0.5	0.0	16.9	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	2	6	113	25	3
Future Vol, veh/h	91	2	6	113	25	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	2	7	123	27	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	237	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	137	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1491	-	751	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1491	-	747	956
Mov Cap-2 Maneuver	-	-	-	-	747	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	886	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	765	-	-	1491	-
HCM Lane V/C Ratio	0.04	-	-	0.004	-
HCM Control Delay (s)	9.9	-	-	7.4	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	75	79	10	22	52
Future Vol, veh/h	22	75	79	10	22	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	82	86	11	24	57

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	97	0	-	0	222	92
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	130	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1496	-	-	-	766	965
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1496	-	-	-	753	965
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	896	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1496	-	-	-	890
HCM Lane V/C Ratio	0.016	-	-	-	0.09
HCM Control Delay (s)	7.4	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	62	67	493	507	32
Future Vol, veh/h	15	62	67	493	507	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	67	73	536	551	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	983	569	586	0	-	0
Stage 1	569	-	-	-	-	-
Stage 2	414	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	260	521	987	-	-	-
Stage 1	565	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	241	521	987	-	-	-
Mov Cap-2 Maneuver	370	-	-	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	987	-	370	521	-	-
HCM Lane V/C Ratio	0.074	-	0.044	0.129	-	-
HCM Control Delay (s)	8.9	-	15.2	12.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.4	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	40	18	0	11	26	0	5	3	0	9
Future Vol, veh/h	17	0	40	18	0	11	26	0	5	3	0	9
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	43	20	0	12	28	0	5	3	0	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	76	72	5	92	75	3	10	0	0	5	0	0
Stage 1	11	11	-	59	59	-	-	-	-	-	-	-
Stage 2	65	61	-	33	16	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	914	818	1078	892	815	1081	1610	-	-	1616	-	-
Stage 1	1010	886	-	953	846	-	-	-	-	-	-	-
Stage 2	946	844	-	983	882	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	891	802	1078	844	800	1081	1610	-	-	1616	-	-
Mov Cap-2 Maneuver	891	802	-	844	800	-	-	-	-	-	-	-
Stage 1	993	884	-	937	832	-	-	-	-	-	-	-
Stage 2	920	830	-	941	880	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	9	6.1	1.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1610	-	-	1014	921	1616	-	-
HCM Lane V/C Ratio	0.018	-	-	0.061	0.034	0.002	-	-
HCM Control Delay (s)	7.3	0	-	8.8	9	7.2	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-

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	13	0	22	21	0	18	7	532	6	6	508	4
Future Vol, veh/h	13	0	22	21	0	18	7	532	6	6	508	4
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	-	-	-	0	-	0	100	-	-	100	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	0	24	23	0	20	8	578	7	7	552	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	871	1167	276	888	-	293	556	0	0	585	0	0
Stage 1	566	566	-	598	-	-	-	-	-	-	-	-
Stage 2	305	601	-	290	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	245	192	721	238	0	703	1011	-	-	986	-	-
Stage 1	476	506	-	456	0	-	-	-	-	-	-	-
Stage 2	680	488	-	694	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	235	189	721	228	-	703	1011	-	-	986	-	-
Mov Cap-2 Maneuver	235	189	-	228	-	-	-	-	-	-	-	-
Stage 1	472	502	-	452	-	-	-	-	-	-	-	-
Stage 2	656	484	-	666	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	16.9	0.1	0.1
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1011	-	-	408	228	703	986	-	-
HCM Lane V/C Ratio	0.008	-	-	0.093	0.1	0.028	0.007	-	-
HCM Control Delay (s)	8.6	-	-	14.7	22.5	10.3	8.7	-	-
HCM Lane LOS	A	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.3	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	15	549	15	5	540
Future Vol, veh/h	52	15	549	15	5	540
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	16	597	16	5	587

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	909	307	0	0	613	0
Stage 1	605	-	-	-	-	-
Stage 2	304	-	-	-	-	-
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	274	689	-	-	962	-
Stage 1	508	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	273	689	-	-	962	-
Mov Cap-2 Maneuver	273	-	-	-	-	-
Stage 1	508	-	-	-	-	-
Stage 2	718	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	316	962	-
HCM Lane V/C Ratio	-	-	0.23	0.006	-
HCM Control Delay (s)	-	-	19.8	8.8	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0.9	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	303	370	39	238	158	452	945	99	181	1037	327
Future Volume (veh/h)	394	303	370	39	238	158	452	945	99	181	1037	327
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	415	372	354	41	251	166	476	995	104	191	1092	344
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	372	711	603	96	209	138	436	1308	583	213	1284	573
Arrive On Green	0.21	0.38	0.38	0.03	0.20	0.20	0.13	0.37	0.37	0.12	0.36	0.36
Sat Flow, veh/h	1781	1870	1585	3456	1051	695	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	415	372	354	41	0	417	476	995	104	191	1092	344
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1745	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	30.3	22.3	25.8	1.7	0.0	28.9	18.3	35.6	6.4	15.3	41.1	25.7
Cycle Q Clear(g_c), s	30.3	22.3	25.8	1.7	0.0	28.9	18.3	35.6	6.4	15.3	41.1	25.7
Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	372	711	603	96	0	348	436	1308	583	213	1284	573
V/C Ratio(X)	1.11	0.52	0.59	0.43	0.00	1.20	1.09	0.76	0.18	0.90	0.85	0.60
Avail Cap(c_a), veh/h	372	711	603	157	0	348	436	1308	583	217	1284	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.3	34.7	35.8	69.3	0.0	58.1	63.4	40.2	31.0	62.9	42.7	37.8
Incr Delay (d2), s/veh	81.5	2.7	4.2	3.0	0.0	113.9	59.3	2.3	0.4	34.2	7.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.1	10.8	10.7	0.8	0.0	23.8	11.5	15.5	2.6	8.8	18.7	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	138.8	37.5	40.0	72.3	0.0	172.0	122.6	42.5	31.3	97.1	49.9	42.4
LnGrp LOS	F	D	D	E	A	F	F	D	C	F	D	D
Approach Vol, veh/h		1141			458			1575			1627	
Approach Delay, s/veh		75.1			163.1			66.0			53.8	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	24.0	60.2	36.0	35.3	23.0	61.2	9.7	61.6
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 18	42.5	* 30	* 29	* 18	43.1	* 6.6	52.3
Max Q Clear Time (g_c+I1), s	20.3	43.1	32.3	30.9	17.3	37.6	3.7	27.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	4.7	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	73.3
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	690	497	0	0	1
Future Vol, veh/h	2	690	497	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	750	540	0	0	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	540	0	-	0	919	270
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	379	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	1025	-	-	-	270	728
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1025	-	-	-	269	728
Mov Cap-2 Maneuver	-	-	-	-	269	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1025	-	-	-	728
HCM Lane V/C Ratio	0.002	-	-	-	0.001
HCM Control Delay (s)	8.5	-	-	-	10
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	638	59	24	471	28	8
Future Vol, veh/h	638	59	24	471	28	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	693	64	26	512	30	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	757	0	1033	379
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	308	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	850	-	228	619
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	850	-	221	619
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	440	-
Stage 2	-	-	-	-	697	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	21.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	-	-	850	-
HCM Lane V/C Ratio	0.152	-	-	0.031	-
HCM Control Delay (s)	21.4	-	-	9.4	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	353	320	192	429	381	83
Future Volume (veh/h)	353	320	192	429	381	83
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	372	337	202	452	401	87
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	894	410	240	2189	1267	272
Arrive On Green	0.26	0.26	0.13	0.62	0.44	0.44
Sat Flow, veh/h	3456	1585	1781	3647	3003	625
Grp Volume(v), veh/h	372	337	202	452	243	245
Grp Sat Flow(s),veh/h/ln	1728	1585	1781	1777	1777	1758
Q Serve(g_s), s	7.8	17.4	9.6	4.9	7.8	7.9
Cycle Q Clear(g_c), s	7.8	17.4	9.6	4.9	7.8	7.9
Prop In Lane	1.00	1.00	1.00			0.36
Lane Grp Cap(c), veh/h	894	410	240	2189	774	765
V/C Ratio(X)	0.42	0.82	0.84	0.21	0.31	0.32
Avail Cap(c_a), veh/h	1211	556	389	2189	774	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.8	30.4	36.8	7.4	16.1	16.1
Incr Delay (d2), s/veh	0.4	8.3	4.4	0.2	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.9	4.4	1.7	3.2	3.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.2	38.7	41.2	7.6	17.1	17.2
LnGrp LOS	C	D	D	A	B	B
Approach Vol, veh/h	709			654	488	
Approach Delay, s/veh	32.7			17.9	17.2	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		59.0		28.0	15.7	43.3
Change Period (Y+Rc), s		5.4		5.5	4.0	5.4
Max Green Setting (Gmax), s		53.6		30.5	19.0	30.6
Max Q Clear Time (g_c+I1), s		6.9		19.4	11.6	9.9
Green Ext Time (p_c), s		6.4		3.1	0.2	5.2

Intersection Summary			
HCM 6th Ctrl Delay			23.4
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	117	298	134	131	117	317	1092	160	60	1208	148
Future Volume (veh/h)	128	117	298	134	131	117	317	1092	160	60	1208	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, 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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	139	127	324	146	142	127	345	1187	174	65	1313	161
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	162	542	459	172	226	202	372	1564	698	82	1345	600
Arrive On Green	0.09	0.29	0.29	0.05	0.25	0.25	0.11	0.44	0.44	0.09	0.76	0.76
Sat Flow, veh/h	1781	1870	1585	3456	910	814	3456	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	139	127	324	146	0	269	345	1187	174	65	1313	161
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1728	0	1724	1728	1777	1585	1781	1777	1585
Q Serve(g_s), s	11.2	7.5	26.5	6.1	0.0	20.1	14.4	40.7	10.0	5.2	49.8	4.5
Cycle Q Clear(g_c), s	11.2	7.5	26.5	6.1	0.0	20.1	14.4	40.7	10.0	5.2	49.8	4.5
Prop In Lane	1.00		1.00	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	162	542	459	172	0	429	372	1564	698	82	1345	600
V/C Ratio(X)	0.86	0.23	0.71	0.85	0.00	0.63	0.93	0.76	0.25	0.79	0.98	0.27
Avail Cap(c_a), veh/h	192	542	459	172	0	429	372	1564	698	103	1345	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Uniform Delay (d), s/veh	65.0	39.2	46.0	68.4	0.0	48.5	64.1	34.1	25.5	65.2	17.0	11.5
Incr Delay (d2), s/veh	24.4	1.0	8.8	30.0	0.0	2.9	28.7	3.5	0.9	8.2	9.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	3.7	11.6	3.4	0.0	9.1	7.7	17.7	4.0	2.4	8.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.5	40.3	54.8	98.4	0.0	51.4	92.8	37.6	26.4	73.4	26.5	11.8
LnGrp LOS	F	D	D	F	A	D	F	D	C	E	C	B
Approach Vol, veh/h		590			415			1706			1539	
Approach Delay, s/veh		59.8			67.9			47.6			26.9	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.3	62.4	18.9	42.4	12.4	71.3	12.9	48.4
Change Period (Y+Rc), s	* 5.7	7.5	* 5.7	* 6.4	* 5.7	7.5	* 5.7	6.4
Max Green Setting (Gmax), s	* 16	54.9	* 16	* 34	* 8.4	62.1	* 7.2	42.0
Max Q Clear Time (g_c+I1), s	16.4	51.8	13.2	22.1	7.2	42.7	8.1	28.5
Green Ext Time (p_c), s	0.0	2.9	0.0	1.2	0.0	16.6	0.0	1.6

Intersection Summary	
HCM 6th Ctrl Delay	43.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	201	7	5	164	47	7
Future Vol, veh/h	201	7	5	164	47	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	218	8	5	178	51	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	226	0	410	222
Stage 1	-	-	-	-	222	-
Stage 2	-	-	-	-	188	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1342	-	598	818
Stage 1	-	-	-	-	815	-
Stage 2	-	-	-	-	844	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1342	-	596	818
Mov Cap-2 Maneuver	-	-	-	-	596	-
Stage 1	-	-	-	-	815	-
Stage 2	-	-	-	-	841	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	618	-	-	1342	-
HCM Lane V/C Ratio	0.095	-	-	0.004	-
HCM Control Delay (s)	11.4	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	146	116	40	12	44
Future Vol, veh/h	80	146	116	40	12	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	159	126	43	13	48

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	169	0	-	0	481	148
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1409	-	-	-	544	899
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1409	-	-	-	507	899
Mov Cap-2 Maneuver	-	-	-	-	507	-
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	726	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1409	-	-	-	771
HCM Lane V/C Ratio	0.062	-	-	-	0.079
HCM Control Delay (s)	7.7	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	118	151	601	512	30
Future Vol, veh/h	32	118	151	601	512	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	None
Storage Length	0	0	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	128	164	653	557	33

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1229	574	590	0	-	0
Stage 1	574	-	-	-	-	-
Stage 2	655	-	-	-	-	-
Critical Hdwy	6.63	6.23	4.13	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	183	517	983	-	-	-
Stage 1	562	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	152	517	983	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	480	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.3	1.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	983	-	286	517	-	-
HCM Lane V/C Ratio	0.167	-	0.122	0.248	-	-
HCM Control Delay (s)	9.4	-	19.3	14.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.6	-	0.4	1	-	-

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	20	0	31	10	0	6	98	0	18	11	0	31
Future Vol, veh/h	20	0	31	10	0	6	98	0	18	11	0	31
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	0	34	11	0	7	107	0	20	12	0	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	269	275	17	282	282	10	34	0	0	20	0	0
Stage 1	41	41	-	224	224	-	-	-	-	-	-	-
Stage 2	228	234	-	58	58	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	684	632	1062	670	627	1071	1578	-	-	1596	-	-
Stage 1	974	861	-	779	718	-	-	-	-	-	-	-
Stage 2	775	711	-	954	847	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	640	584	1062	611	579	1071	1578	-	-	1596	-	-
Mov Cap-2 Maneuver	640	584	-	611	579	-	-	-	-	-	-	-
Stage 1	907	854	-	725	668	-	-	-	-	-	-	-
Stage 2	717	662	-	916	840	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	10.1	6.3	1.9
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	844	728	1596	-	-
HCM Lane V/C Ratio	0.068	-	-	0.066	0.024	0.007	-	-
HCM Control Delay (s)	7.4	0	-	9.6	10.1	7.3	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.1	0	-	-

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	7	0	13	12	0	12	22	645	21	21	547	13
Future Vol, veh/h	7	0	13	12	0	12	22	645	21	21	547	13
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	-	-	-	0	-	0	100	-	-	100	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	14	13	0	13	24	701	23	23	595	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1040	1413	298	1105	-	362	609	0	0	724	0	0
Stage 1	641	641	-	761	-	-	-	-	-	-	-	-
Stage 2	399	772	-	344	-	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	-	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	-	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	185	137	698	165	0	635	966	-	-	874	-	-
Stage 1	430	468	-	364	0	-	-	-	-	-	-	-
Stage 2	598	407	-	645	0	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	174	130	698	155	-	635	966	-	-	874	-	-
Mov Cap-2 Maneuver	174	130	-	155	-	-	-	-	-	-	-	-
Stage 1	419	456	-	355	-	-	-	-	-	-	-	-
Stage 2	571	397	-	615	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.3	20.6	0.3	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	966	-	-	340	155	635	874	-	-
HCM Lane V/C Ratio	0.025	-	-	0.064	0.084	0.021	0.026	-	-
HCM Control Delay (s)	8.8	-	-	16.3	30.3	10.8	9.2	-	-
HCM Lane LOS	A	-	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.3	0.1	0.1	-	-

Intersection						
Int Delay, s/veh	0.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	31	8	713	54	17	619
Future Vol, veh/h	31	8	713	54	17	619
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	-	-	-	160	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	9	775	59	18	673

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1178	417	0	0	834	0
Stage 1	805	-	-	-	-	-
Stage 2	373	-	-	-	-	-
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	184	585	-	-	795	-
Stage 1	400	-	-	-	-	-
Stage 2	666	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	180	585	-	-	795	-
Mov Cap-2 Maneuver	180	-	-	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.4	0	0.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	210	795	-
HCM Lane V/C Ratio	-	-	0.202	0.023	-
HCM Control Delay (s)	-	-	26.4	9.6	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

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Appendix L:
Traffic Signal Warrants

HORIZON YEAR 2040 PLUS PROJECT CONDITIONS
PEAK HOUR VOLUME WARRANT
URBAN CONDITIONS

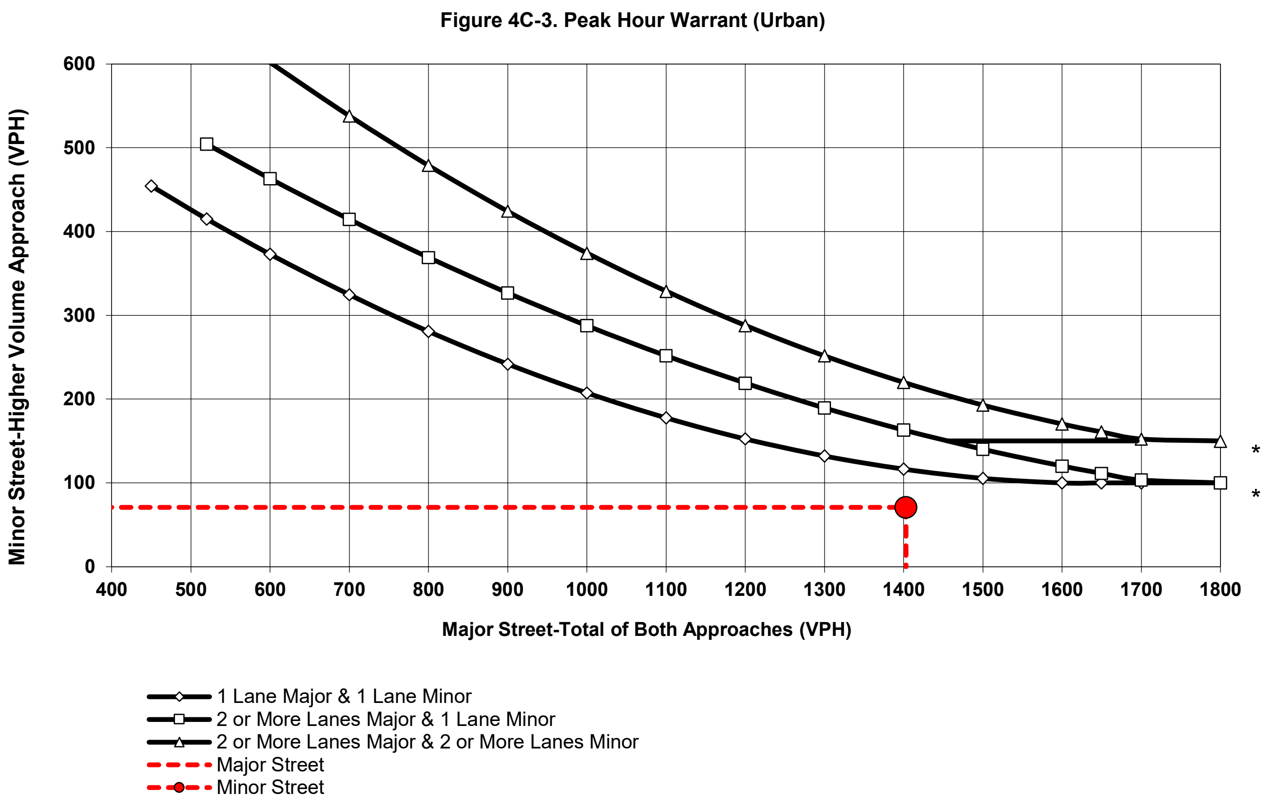
Peak Hour: PM

Major Street: 8th Street

Minor Street: El Dorado Family Apartment Drwy.

Total of Both Approaches (VPH):	1403	Higher Volume Approach (VPH):	71
Number of Approach Lanes:	2	Number of Approach Lanes:	1

SIGNAL WARRANT NOT SATISFIED



* Note:
150 vph Applies as the Lower Threshold Volume for a Minor Street Approach with Two or More Lanes and 100 vph Applies as the Lower Threshold Volume for a Minor Street Approach with One Lane.

Source: California MUTCD 2014 Revision 1

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