DRAFT

INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

AIRPORT WAY: YOSEMITE AVENUE TO DANIELS STREET WIDENING

MANTECA, CALIFORNIA

LSA

November 2019

This page intentionally left blank

DRAFT

INITIAL STUDY/
MITIGATED NEGATIVE DECLARATION

AIRPORT WAY: YOSEMITE AVENUE TO DANIELS STREET WIDENING

MANTECA, CALIFORNIA

Submitted to:

City of Manteca
Department of Public Works
1001 West Center Street
Manteca, California 95337

Prepared by:

LSA
201 Creekside Ridge Court, Suite 250
Roseville, California 95678
(916) 772-7450

Project No. MKT1603

LSA

November 2019

This page intentionally left blank

TABLE OF CONTENTS

APPENDICES

This page intentionally left blank

FIGURES AND TABLES

FIGURES

TABLES

This page intentionally left blank

LIST OF ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/m^3	micrograms per cubic meter
AB	Assembly Bill
ACE	Altamont Commuter Express
ADA	Americans with Disabilities Act
ADL	aerially deposited lead
APN	Assessor's Parcel Number
BSA	Biological Study Area
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
CCaIC	Central California Information Center
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Manteca
CMU	Commercial Mixed Use
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRHR	California Register of Historical Resources

CVRWQCB	Central Valley Regional Water Quality Control Board
dB	decibel(s)
dBA	A-weighted decibel(s)
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FMMP	Farmland Mapping and Monitoring Program
GC	General Commercial
GHG	greenhouse gas
GWP	Global Warming Potential
HCP	habitat conservation plan
HFC	hydrofluorocarbon
IS	Initial Study
ITMM	Incidental Take Minimization Measure
L_{dn}	day/night average noise level
L_{eq}	equivalent continuous sound level
LI	Light Industrial
L_{max}	maximum instantaneous noise level
LOS	level(s) of service
LUST	leaking underground storage tank
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
mph	mile(s) per hour
MRZ	Mineral Resource Zone
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
NO_2	nitrogen dioxide

NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OHP	Office of Historic Preservation
PFC	perfluorocarbon
PFIP	Public Facilities Implementation Plan
PG&E	Pacific Gas and Electric Company
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PRC	California Public Resources Code
Project	Airport Way: Yosemite Avenue to Daniels Street Widening
Roadmod	Road Construction Emissions Model, Version 9.0.0
ROG	reactive organic gases
SF_6	sulfur hexafluoride
SJAC	San Joaquin County Agricultural Commissioner
SJMSCP	San Joaquin County Multi-Species Habitat Conservation and Open Space Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SO_X	sulfur oxides
SPCP	Spill Prevention and Countermeasure Plan
SR	State Route
SSJID	South San Joaquin Irrigation District

STC	Sound Transmission Class
U.S.	United States
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
VdB	vibration velocity decibel(s)
VELB	valley elderberry longhorn beetle
VMT	vehicle miles traveled

1.0 PROJECT INFORMATION

1. **Project Title:**

   Airport Way: Yosemite Avenue to Daniels Street Widening (herein referred to as "Project")

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

   City of Manteca
   Department of Public Works
   1001 West Center Street
   Manteca, California 95337

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

   Koosun Kim, PE, QSD
   Deputy Director of Public Works
   City of Manteca
   (209) 456-8419
   kkim@ci.manteca.ca.us

4. **Project Location:**

   The Project site is in Manteca, in southern San Joaquin County. The Project includes the widening of Airport Way, an existing arterial roadway that runs north to south in the western portion of the city. The Project site is located from just north of the Yosemite Avenue intersection to north of the State Route (SR) 120/Airport Way interchange (Daniels Street). The site is approximately 15.2 acres in size and includes approximately 0.9 mile along Airport Way. **Figure 1: Regional Location** and **Figure 2: Project Vicinity** show the location of the Project site on a regional and local scale, respectively. **Figure 3: Project Footprint** indicates the limits of the Project site.

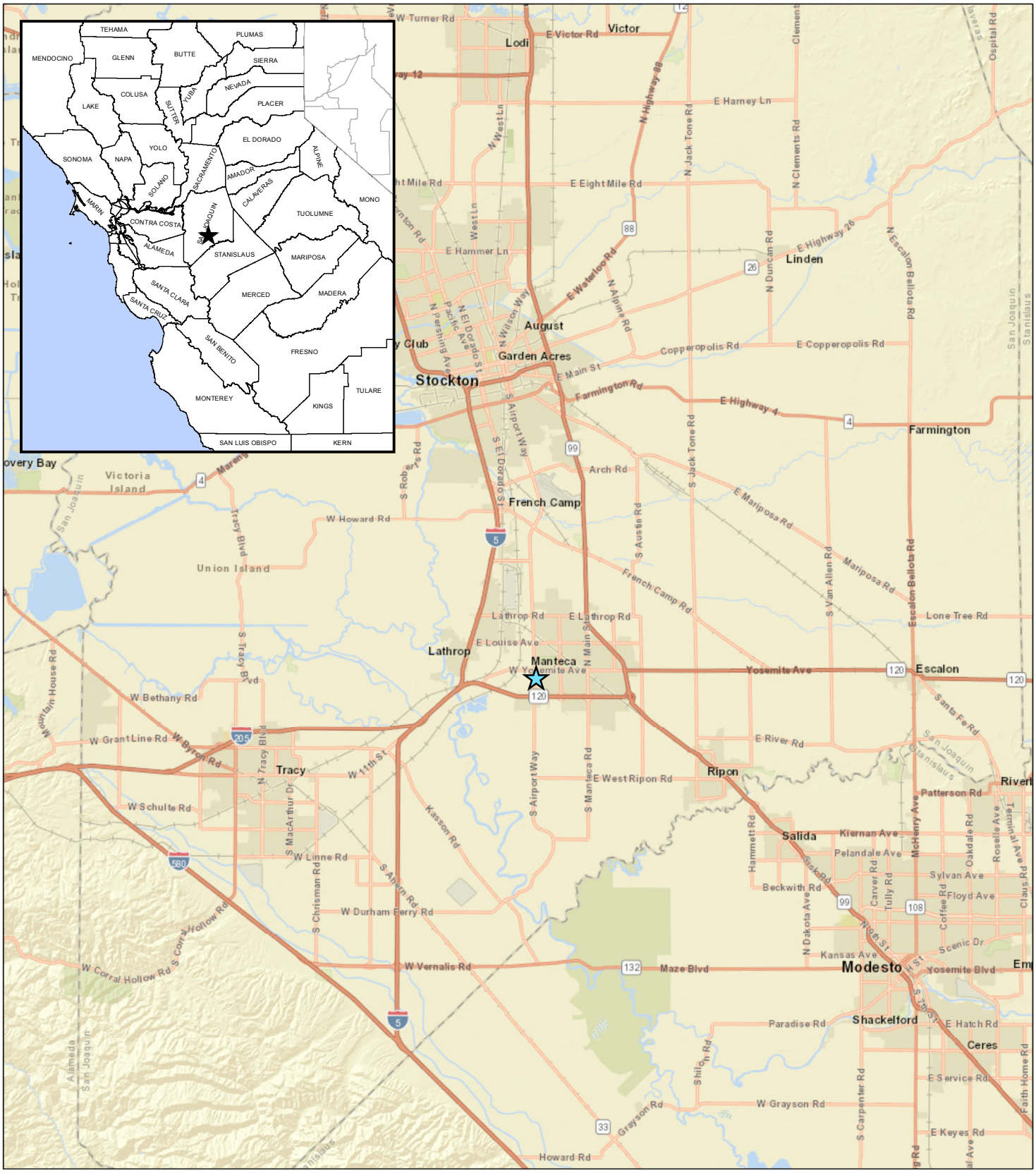
5. **Project Sponsor's Name and Address:**

   City of Manteca
   Department of Public Works
   1001 West Center Street
   Manteca, California 95337

6. **General Plan Designation:**

   The City of Manteca (City) General Plan 2023 Policy Document Land Use Map identifies the parcels surrounding the Project site as Light Industrial (LI), General Commercial (GC), and Commercial Mixed Use (CMU).

This page intentionally left blank



LSA

LEGEND

Project Location

FIGURE 1

N

0 2.5 5

Miles

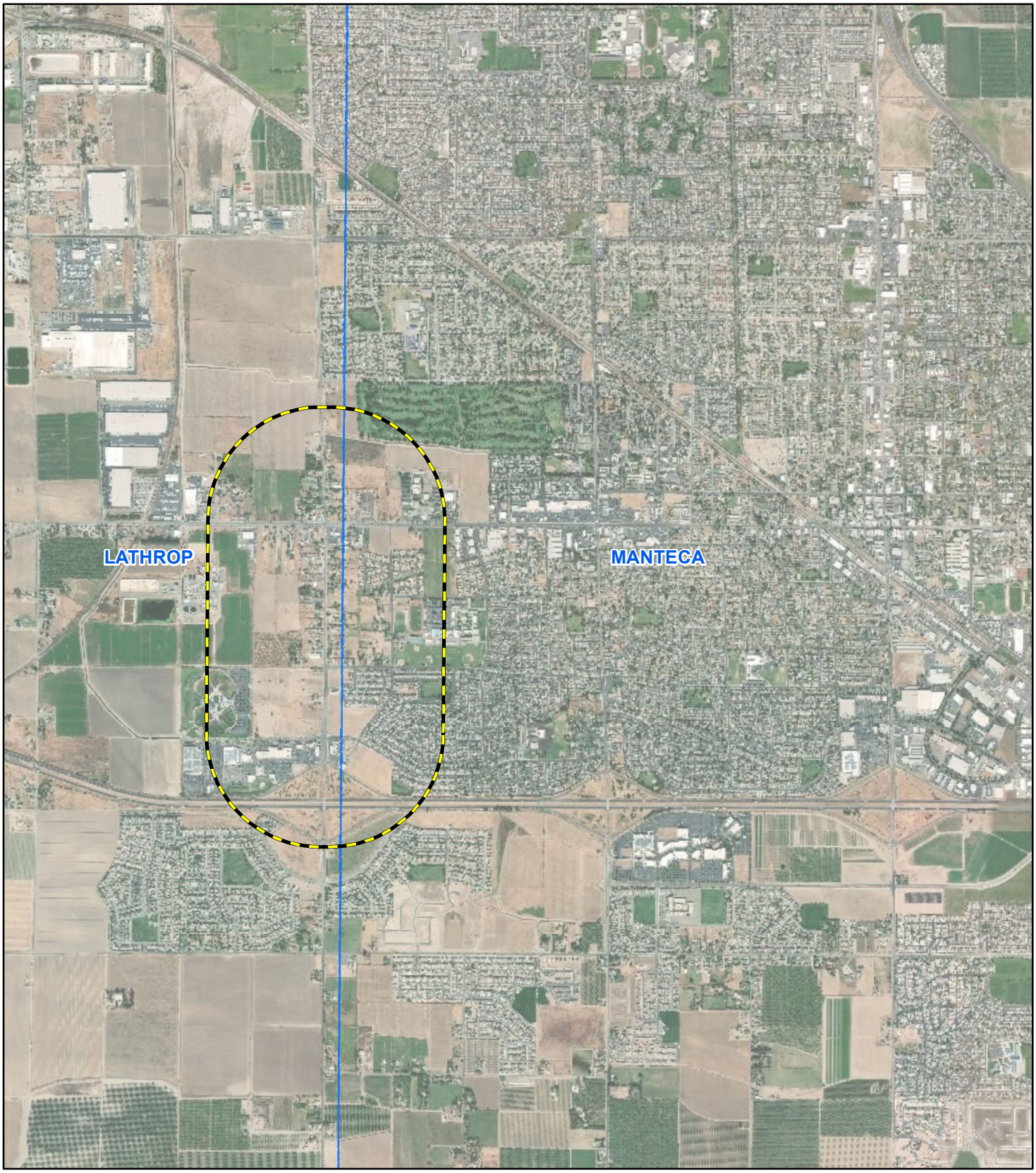
Airport Way Widening Project
Manteca, California
LSA Project No. MKT1603

Regional Location

SOURCE: ESRI World Street Map (06/2018)

I:\MKT1603\GIS\Reports\ISMND\Figure_1_Regional.mxd (8/27/2018)

This page intentionally left blank



LSA

LEGEND

Study Area

USGS 7.5' Quad Boundaries

N

0 1250 2500

FEET

SOURCE: DigitalGlobe Aerial Imagery (10/2017)

I:\MKT1603\GIS\Reports\ISMND\Figure_2_Vicinity_v2.mxd (8/28/2018)

FIGURE 2

Airport Way Widening Project
Manteca, California
LSA Project No. MKT1603

Project Vicinity

This page intentionally left blank

LSA

LEGEND

APE

FIGURE 3

N

0 350 700

FEET

SOURCE:DigitalGlobe Aerial Imagery (10/2017)

I:\MKT1603\GIS\Reports\ISMND\Figure3_Project_Footprint.mxd (8/28/2018)

Airport Way Widening Project
Manteca, California
LSA Project No, MKT1603

Project Footprint

This page intentionally left blank

7. Zoning:

The Project includes an existing roadway and therefore is not zoned. The Project will occur on the roadway right-of-way. Parcels surrounding the Project site are zoned for CMU (Commercial Mixed Use), GC (General Commercial), and M1 (Light Industrial).

8. Description of Project:

The City began its review of the Airport Way widening back in the early 1990s. As the development and traffic levels within Manteca have grown, the need for the widening has increased. Airport Way is a north-south arterial that connects the western side of Manteca to developments located to the south, serving vehicle, transit, and goods movement. The roadway serves as a key connection from SR-120 into the city and future development. The corridor serves build out of the Land Use Element, which includes residential, commercial, industrial, and institutional uses. Additionally, Class II bike lanes are proposed along Airport Way per the City's Bicycle Master Plan. The bike lanes would provide linkage from SR-120 to Lathrop Road and would ultimately provide connection to the Tidewater Bikeway, Lathrop, and unincorporated San Joaquin County. Airport Way also provides a link to the San Francisco Bay Area through the Altamont Commuter Express (ACE) train station and includes access to many public facilities, including parks, baseball fields, Sierra High School, and the Manteca Wastewater Quality Control Facility.

The Project consists of widening Airport Way from the existing two lanes to a six-lane arterial roadway from north of Yosemite Avenue to just north of Daniels Street. The ultimate six-lane configuration includes three travel lanes in each direction, a raised median, a 5-foot Class II bike lane, and a 6-foot sidewalk with curb and gutter on either side of the street.

The Project may be phased. The first phase would widen the existing roadway to a four-lane facility. When funding is available, the roadway would then be further widened to the ultimate six-lane facility. The improvements for the initial phase include two travel lanes and a Class II bike lane in each direction with a two-way turn lane. Curb, gutter, and sidewalk are proposed on the east side of the roadway only.

To maintain the existing drainage pattern and comply with stormwater quality requirements, both the four-lane phase and the ultimate six-lane facility include construction of percolation basins for on-site stormwater treatment. The design and construction of the percolation basins would comply with the City's Storm Drain Master Plan, with the capacity to detain stormwater runoff volume of a 10-year, 48-hour-duration storm within 96 hours.

The improvements for both phases also include relocation of electrical distribution and transmission overhead lines on either side of the street. Pacific Gas and Electric Company's (PG&E) overhead transmission line on the west side of the street will need to be relocated due to the proposed widening, while the distribution overhead line on the east side will be undergrounded using available Rule 20A funding.

In order to accommodate the roadway widening and applicable improvements, the Project will require full- and partial-parcel acquisition of several properties along Airport Way. Relocation

assistance will be provided to affected residents and business owners in accordance with California Government Code Sections 7260–7277.

The Project is locally funded using Measure K funds. As such, a California Environmental Quality Act (CEQA) environmental document is required. This Initial Study/Mitigated Negative Declaration (IS/MND) has been completed to assess the environmental impacts of the six-lane arterial roadway build out.

9. Surrounding Land Uses and Setting:

The Project is located in the southwestern portion of Manteca, north of SR-120 along Airport Way. Existing land uses include agricultural, single-family residential, multifamily residential, institutional, industrial nonmanufacturing, and commercial. According to the City of Manteca General Plan 2023 Policy Document Land Use Map, the planned surrounding land uses include Light Industrial (LI), General Commercial (GC), and Commercial Mixed Use (CMU).

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

- Regional Water Quality Control Board National Pollutant Discharge Elimination System (NPDES) Stormwater General Construction Permit
- City of Manteca Street Tree Permit

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resource Code section 21080.3.1? If so, has consultation begun?

The City provided traditionally and culturally affiliated tribal groups the opportunity to consult under Assembly Bill (AB) 52 if they have requested, in writing, notice from the Lead Agency of any proposed projects in the area. Please refer to Sections 3.5 and 3.17 of this document for additional detail.

2.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

☐ Aesthetics	☐ Agriculture 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

2.1 DETERMINATION

On the basis of this initial evaluation:

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

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

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

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

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

Signature _____ Date _____

Signature _____ Date _____

This page intentionally left blank

3.0 CEQA ENVIRONMENTAL CHECKLIST

3.1 AESTHETICS

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

3.1.1 Environmental Setting

Manteca is located in San Joaquin County, in the heart of California's Central Valley. The region is primarily flat; however, the Sierra Nevada, the Coast Ranges, Mount Boardman, and Eagle Mountain can be seen in the distance and provide aesthetic qualities. Land surrounding Manteca is primarily used for agricultural production, including orchards and field crops.

The Project is located on an existing roadway (Airport Way) on the western side of the city. The Project site begins north of the Airport Way/Yosemite Avenue intersection and ends just north of Daniels Street before to the SR-120 connection. Airport Way is a north/south arterial that serves vehicle, transit, and goods movement, and is considered a key connection from SR-120 into the city and future development.

Existing land uses adjacent to the Project site include agricultural, residential, institutional, commercial, and industrial uses. Existing structures along the corridor include a gas station, automobile repair and service shops, religious institutions, and single-family residences. Several vacant lots along the corridor were previously converted from agricultural uses. Commercial uses to the south of the Project, along Daniels Street, include gas stations, restaurants, and retail stores.

The City of Manteca General Plan 2023 Policy Document includes the following relevant policies regarding aesthetics:

- **CD-P-15:** Major arterial streets shall include a common landscape theme that includes primary street trees, ground cover, sidewalks, bus shelters where required, and lighting applied throughout the city.

- **CD-P-16:** The City shall develop special design standards for the perimeter road system comprising Lathrop Road, Austin Road, Woodward Avenue, and Airport Way to ensure their development as divided roadways.

No designated State scenic highways or locally designated scenic roadways are within or adjacent to the Project site (County of San Joaquin 2016). The closest officially designated State scenic highway is Interstate 580, located approximately 14 miles southwest of the Project site (California Department of Transportation [Caltrans] 2018).

3.1.2 Impact Analysis

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

NO IMPACT. The Project area does not contain any designated scenic vistas. The Project includes the widening of an existing roadway and does not include the construction of any structures that could block views of any scenic vista. The Project would not have any substantial effect on a scenic vista and no impact will occur. Mitigation is not required.

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

NO IMPACT. No designated State scenic highways or locally designated scenic roadways are within or adjacent to the Project site. Therefore, the Project would not substantially damage scenic resources within a State scenic highway. No impact will occur and no mitigation is required.

c. In non-urbanized areas, would the project substantially degrade the existing visual character or quality 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?

LESS THAN SIGNIFICANT IMPACT. The proposed project is located in an urbanized area of Manteca, on the existing Airport Way. Airport Way is a road that does not have a zoning designation per the City of Manteca Zoning Code. The Project would widen an existing two-lane roadway to a six-lane roadway. In addition, the Project would include a raised median, sidewalks, and bike lanes that would increase the visual character and quality of the site. Improvements would also be made to the electrical distribution and transmission overhead lines (specifically, transmission lines on the east side of the roadway would be moved underground). Construction of the Project would require the staging and use of construction equipment and would temporarily affect the visual character or quality of the site. Thirty-three landscaping trees within the Project area would be removed during construction. However, the City of Manteca would be responsible for replacing these trees consistent with the Manteca Street Tree Plan. Residents, business owners, motorists traveling through the area, and other visitors would notice changes to the existing conditions; however, these changes would be minor and would not degrade the visual quality of the area. The Project area is topographically flat; therefore, the Project would not affect any vistas. Implementation of the project would not substantially degrade the existing visual character or quality of public views of the

site and its surroundings and would not conflict with applicable zoning and other regulations governing scenic quality. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. No additional street lighting would be included in the Project. The Project would increase the capacity for additional vehicle traffic, but would not increase population and therefore would not directly increase vehicle traffic. A design standard would be included to increase street landscape vegetation to reduce any possible increase of light or glare from vehicle headlights. As stated in the City of Manteca General Plan 2023, Community Design policies, any additional street lighting should provide directional shielding to minimize the annoyance of direct or indirect glare. The Project would not create a significant new source of substantial light or glare that would adversely affect day or nighttime views in the area. Impacts will be less than significant and no mitigation is required.

3.2 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 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 forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

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

3.2.1 Environmental Setting

The California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California's agricultural resources based on soil information documented by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The NRCS l rates agricultural land according to soil quality and irrigation status. Lands with soils best suited for agricultural production are designated as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance and are collectively known as Important Farmland. The FMMP maps are updated every 2 years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance. The FMMP's statistical and mapping information syncs with modern soil surveys developed by the USDA. The FMMP designates land into the following categories: Prime Farmland; Farmland of Statewide Importance; Unique Farmland; Farmland of Local Importance; Grazing Land; Urban and Built-Up Land; Other Land; and Water. The following provides definitions of each of these designations:

- **Prime Farmland—**Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. Prime Farmland has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Lands designated as Prime Farmland must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.

- **Farmland of Statewide Importance—**Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Lands with a "Farmland of Statewide Importance" designation must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.

- **Unique Farmland—**Farmland of lesser-quality soils used for production of the State's leading agricultural crops. This land is usually irrigated, but it may include non-irrigated orchards or vineyards, as found in some climatic zones in California. Land must have been cropped at some time during the 4 years prior to the mapping date.

- **Farmland of Local Importance—**Land of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee.

- **Grazing Land—**Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattleman's Association, the University of California Cooperative Extension, and other groups interested in the extent of grazing activities.

- **Urban and Built-Up Land—**Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- **Other Land—**Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines; borrow pits; and water bodies smaller than 40 acres. Vacant and non-agricultural land surrounded on all sides by urban development and greater than 40 acres is mapped under this designation.

- **Water—**Perennial water bodies with an extent of at least 40 acres.

The California Department of Conservation conducted the Rural Land Mapping Project to create subdivisions of the Other Land map classification. The five new categories listed below were established to better characterize agricultural land conversions.

- **Rural Residential Land—**Residential areas of one to five structures per 10 acres.
- **Semi-Agricultural and Rural Commercial Land—**Farmsteads, agricultural storage and packing sheds, unpaved parking areas, composting facilities, equine facilities, firewood lots, and campgrounds.
- **Vacant or Disturbed Land—**Open-field areas that do not qualify for an agricultural category, mineral and oil extraction areas, off-road vehicle areas, electrical substations, channelized canals, and rural freeway interchanges.
- **Confined Animal Agriculture—**Poultry facilities, feedlots, dairy facilities, and fish farms.[1]
- **Nonagricultural or Natural Vegetation—**Heavily wooded, rocky, or barren areas; riparian and wetland areas; grassland areas that do not qualify for Grazing Land designation due to their size or land management restrictions; small water bodies; and recreational water ski lakes. Constructed wetlands are also included in this category.

The Project site is in western Manteca and includes existing single-family residential, multifamily residential, institutional, commercial, industrial, and agricultural land uses. The Project size totals 15.2 acres.

The Department of Conservation has primarily designated the Project site as Urban and Built-Up Land, Rural Residential Land, Vacant or Disturbed Land, Semi-Agricultural and Rural Commercial Land, and Farmland of Local Importance. The land west of Airport Way, between the Wawona Street intersection and Milo Candini Drive, is designated as Farmland of Statewide Importance. Small slivers of Farmland of Statewide Importance would be acquired from the following Assessor's Parcel Numbers (APN): 241-31-043, 241-31-038, 241-31-039, and 241-31-042. Widening of Airport Way would require the conversion of a total of 0.58 acre of Farmland of Statewide Importance.

No Williamson Act parcels are located within or adjacent to the Project site (San Joaquin Valley Gateway, 2015).

3.2.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. The Project would include the widening of an existing roadway from a two-lane road to a six-lane road. The Project would result in the conversion of 0.58 acre of Farmland of Statewide Importance. According to the Farmland Protection Policy Act, small acreages (i.e., 10 acres or less per linear mile or 3 acres where there is a project for an existing bridge or interchange) where a statewide, local, or tribal Land Evaluation and Site Assessment system has been approved by the Department of Conservation are considered exempt. A statewide Land

[1] This use may be a component of Farmland of Local Importance in some counties.

Evaluation and Site Assessment system has been approved by the California Department of Conservation. Therefore, the Project will have less than significant impacts related to the conversion of farmland to non-agricultural use. No mitigation is required.

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

NO IMPACT. The Project does not include any Williamson Act contract parcels. The Project would occur in the roadway right-of-way and is not zoned. Parcels surrounding the Project site are zoned as M1 (Light Industrial), GC (General Commercial), and CMU (Commercial Mixed Use). No agriculture zoning is included in the Project area. In addition, the widening of Airport Way would occur within the existing right-of-way easement, and the City will make adjustments to the easement as part of the Project. The Project would not conflict with existing zoning for agricultural use or with a Williamson Act contract. Therefore, the Project will result in no impact and no mitigation is required.

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

NO IMPACT. The Project does not include any forest land, timberland, or timberland zoned Timberland Production. No impact will occur and no mitigation is required.

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

NO IMPACT. The Project does not include any forest land. Therefore, the Project would not result in the loss of forest land or conversion of forest land to nonforest use. No impact will occur and no mitigation is required.

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

NO IMPACT. As discussed under Response 3.2(a), the Project would result in a less than significant conversion of Important Farmland to non-agricultural use. No other changes in the existing environment would result in the conversion of farmland or forest land. No impact will occur and no mitigation is required.

3.3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

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

3.3.1 Environmental Setting

An *Air Quality Impact Analysis* was completed for the Project within Manteca, California. The *Air Quality Impact Analysis* was prepared using methods and assumptions recommended in the San Joaquin Valley Air Pollution Control District's (SJVAPCD) *Guidance for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015b).

3.3.1.1 Attainment Status

The California Air Resources Board (CARB) is required to designate areas of the State as attainment, nonattainment, or unclassified for all State standards. An *attainment* designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A *nonattainment* designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An *unclassified* designation signifies that data do not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The United States Environmental Protection Agency (USEPA) also designates areas as attainment, nonattainment, or unclassified. **Table 3-A: San Joaquin Valley Attainment Status** provides a summary of the attainment status for the San Joaquin Valley Air Basin (SJVAB) with respect to national ambient air quality standards (NAAQS) and California ambient air quality standards.

Table 3-A: San Joaquin Valley Attainment Status

Pollutant	Designation/Classification	
	National Standards[1]	State Standards[2]
O_3—1-Hour	No National Standard[3]	Nonattainment/Severe
O_3—8-Hour	Nonattainment/Extreme[4]	Nonattainment
PM_{10}	Attainment[5]	Nonattainment
$PM_{2.5}$	Nonattainment[6]	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
NO_2	Attainment/Unclassified	Attainment
SO_2	Attainment/Unclassified	Attainment
Lead (Particulate)	No Designation/Classification	Attainment
Hydrogen Sulfide	No National Standard	Unclassified
Sulfates	No National Standard	Attainment
Visibility-Reducing Particles	No National Standard	Unclassified
Vinyl Chloride	No National Standard	Attainment

Source: San Joaquin Valley Air Pollution Control District. 2016. *San Joaquin Valley Attainment Status*.

1 See 40 CFR Part 81

2 See CCR Title 17 Sections 60200-60210

3 Effective June 15, 2005, the USEPA revoked the federal 1-hour O_3 standard, including associated designations and classifications. The USEPA had previously classified the SJVAB as extreme nonattainment for this standard. The USEPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour O_3 nonattainment areas continue to apply to the SJVAB.

4 Although the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour O_3 standard, the USEPA approved the region's reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

5 On September 25, 2008, the USEPA redesignated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan.

6 The San Joaquin Valley is designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. The USEPA designated the San Joaquin Valley as nonattainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).

CCR = California Code of Regulations
CFR = Code of Federal Regulations
CO = carbon monoxide
NAAQS = National Ambient Air Quality Standards
NO_2 = nitrogen dioxide
O_3 = ozone
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
SJVAB = San Joaquin Valley Air Basin
SO_2 = sulfur dioxide
USEPA = United States Environmental Protection Agency

3.3.1.2 Existing Climate and Air Quality

The SJVAB is approximately 250 miles long and is shaped like a narrow bowl. The sides and southern boundary of the bowl are bordered by mountain ranges. The valley's weather conditions include frequent temperature inversions; long, hot summers; and stagnant, foggy winters, all of which are conducive to the formation and retention of air pollutants.

The SJVAB is typically arid in the summer months, with cool temperatures and prevalent tule fog (i.e., a dense ground fog) in the winter and fall. The average high temperature in the summer months is in the mid-90s (in degrees Fahrenheit [°F]) and the average low in the winter is in the high 40s. January is typically the wettest month of the year, with an average of approximately 2 inches of

rain. Wind direction is typically from the northwest, with mean wind speeds of about 5 to 8 miles per hour (mph).

3.3.1.3 Air Quality Monitoring Results

Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control districts and State air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the USEPA to identify regions as attainment or nonattainment depending on whether the regions met the requirements stated in the primary NAAQS. Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment, such as marginal, moderate, serious, severe, and extreme, are used to classify each air basin in the State on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

Pollutant monitoring results for the years 2016 to 2018 at the Stockton 1593 East Hazelton Avenue ambient air quality monitoring station (the closest monitoring station to the Project site) are shown in **Table 3-B: Ambient Air Quality at the Stockton 1593 East Hazelton Avenue Monitoring Station**. As indicated in the monitoring results, two violations of the 1-hour State ozone (O_3) standard were recorded in 2016. The State 8-hour O_3 standard was exceeded twice in 2015, 2016, and 2017. In addition, the federal 8-hour O_3 standard was exceeded twice in 2015 and 2016 and once in 2017. The State particulate matter less than 10 microns in diameter (PM_{10}) standard was exceeded five times in 2016, seven times in 2017, and five times in 2018 and the State PM_{10} annual arithmetic average standard was exceeded in 2016, 2017, and 2018. In addition, the State particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) standard was exceeded 4 times in 2016, 16 times in 2017, and 25 times in 2018 and the State and federal $PM_{2.5}$ annual arithmetic average standards were exceeded in 2017 and 2018. The carbon monoxide (CO) and nitrogen dioxide (NO_2) standards were not exceeded at this monitoring station during the 3-year period. This monitoring station did not record sulfur dioxide (SO_2) during the 3-year period.

Table 3-B: Ambient Air Quality at the Stockton 1593 East Hazelton Avenue Monitoring Station

Pollutant	Standard	2016	2017	2018
Carbon Monoxide (CO)				
Maximum 1-hour concentration (ppm)		1.7	2.3	3.0
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hour concentration (ppm)		1.3	1.9	2.7
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)				
Maximum 1-hour concentration (ppm)		0.102	0.085	0.088
Number of days exceeded:	State: > 0.09 ppm	2	0	0
Maximum 8-hour concentration (ppm)		0.079	0.080	0.078
Number of days exceeded:	State: > 0.07 ppm	2	2	2
	Federal: > 0.08 ppm	2	2	1
Coarse Particulates (PM_{10})				
Maximum 24-hour concentration (µg/m³)		66.5	92.6	198.6
Number of days exceeded:	State: > 50 µg/m³	5	7	5
	Federal: > 150 µg/m³	0	0	2
Annual arithmetic average concentration (µg/m³)		26.5	28.8	29.5
Exceeded for the year:	State: > 20 µg/m³	Yes	Yes	Yes
	Federal: > 50 µg/m³	No	No	No
Fine Particulates ($PM_{2.5}$)				
Maximum 24-hour concentration (µg/m³)		43.7	53.7	188.0
Number of days exceeded:	Federal: > 35 µg/m³	4	16	25
Annual arithmetic average concentration (µg/m³)		11.8	12.0	17.5
Exceeded for the year:	State: > 12 µg/m³	No	Yes	Yes
	Federal: > 12 µg/m³	No	Yes	Yes
Nitrogen Dioxide (NO_2)				
Maximum 1-hour concentration (ppm)		0.064	0.061	0.065
Number of days exceeded:	State: > 0.250 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.012	0.011	0.012
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)				
Maximum 1-hour concentration (ppm)		ND	ND	ND
Number of days exceeded:	State: > 0.25 ppm	ND	ND	ND
Maximum 3-hour concentration (ppm)		ND	ND	ND
Number of days exceeded:	Federal: > 0.50 ppm	ND	ND	ND
Maximum 24-hour concentration (ppm)		ND	ND	ND
Number of days exceeded:	State: > 0.04 ppm	ND	ND	ND
	Federal: > 0.14 ppm	ND	ND	ND
Annual arithmetic average concentration (ppm)		ND	ND	ND
Exceeded for the year:	Federal: > 0.030 ppm	ND	ND	ND

Source: California Air Resources Board (2018); United States Environmental Protection Agency (2018).
µg/m³ = micrograms per cubic meter
ND = No data. Insufficient (or no) data were available to determine the value.
ppm = parts per million

3.3.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT WITH MITIGATION. An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a nonattainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the San Joaquin Valley into attainment, the SJVAPCD has developed the 2013 Plan for the Revoked 1-Hour Ozone Standard, adopted on September 19, 2013 (SJVAPCD 2013). The SJVAPCD also adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion 8-hour O_3 standard (SJVAPCD 2016).

To ensure the SJVAB's continued attainment of the USEPA PM_{10} standard, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007 (SJVAPCD 2007). SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions) is designed to reduce PM_{10} emissions generated by human activity. The SJVAPCD adopted the 2015 Plan for the 1997 $PM_{2.5}$ Standard in April 2015 to address the USEPA annual $PM_{2.5}$ standard of 15 micrograms per cubic meter ($\mu g/m^3$) and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$ (SJVAPCD 2016, 2015a).

CEQA requires that certain projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from the project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, construction of the Project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of SJVAPCD Regulation VIII would further reduce construction dust impacts. Operational emissions associated with the Project would not exceed SJVAPCD established significance thresholds for CO, nitrogen oxides (NO_X), reactive organic gases (ROG), sulfur oxides (SO_X), PM_{10}, or $PM_{2.5}$ emissions. Therefore, the Project would not conflict with or obstruct implementation of SJVAPCD air quality plans, and a less than significant impact would occur.

The following describes the Project's construction and operation-related air quality impacts. The conclusions are summarized at the end of each subsection. As discussed, impacts would be less than significant for localized CO emissions and operational emissions. Impacts associated with construction-period emissions would be less than significant with implementation of recommended mitigation measures.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by excavation, grading, hauling, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_X, ROG, directly emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants such as diesel exhaust particulate matter.

Site preparation and Project construction would involve grading, paving, and other activities. Construction-related effects on air quality from the Project would be greatest during the grading phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, ROG, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the Project using the Road Construction Emissions Model, Version 9.0.0 (Roadmod), consistent with SJVAPCD recommendations for roadway projects. Construction of the Project would occur over an approximately 5- to 6-month period. This analysis assumes the construction schedule for the Project would be 6 months. In addition, the Project would include approximately 15,500 cubic yards of soil off-haul, which was included in the Roadmod calculations. Other specific construction details are not yet known; therefore, default assumptions (e.g., construction fleet activities) from Roadmod were used. Construction-related emissions are presented in **Table 3-C: Project Construction Emissions (Tons per Year)**. Roadmod output is included in **Appendix A: Air Quality Impact Analysis**.

Table 3-C: Project Construction Emissions (Tons per Year)

	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
Project Construction Emissions	3.7	8.0	0.4	0.0	3.4	0.9
SJVAPCD Significance Threshold	100.0	10.0	10.0	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (September 2018).
CO = carbon monoxide
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
ROG = reactive organic gases
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_X = sulfur oxides

As shown in **Table 3-C**, construction emissions associated with the Project would not exceed CO, NO_X, ROG, SO_X, or $PM_{2.5}$ and PM_{10} exhaust emissions. In addition to the construction-period thresholds of significance, the SJVAPCD has implemented Regulation VIII measures for dust control during construction. These control measures are intended to reduce the amount of PM_{10} emissions during the construction period. Implementation of the following fugitive dust control measures

would ensure that the Project complies with Regulation VIII and further reduces the short-term construction-period air quality impacts.

Consistent with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions), the fugitive dust control measures would be required to be included as specifications for the Project and implemented at the construction site. Such measures are listed below as **Mitigation Measures AQ-1** through **AQ-6.** In addition, as shown in **Table 3-C**, the short-term construction emissions associated with the Project would be below SJVAPCD-established significance thresholds. Therefore, construction of the Project would not result in a violation of air quality standards.

Operational Air Quality Impacts. Long-term air emission impacts are associated with stationary sources and mobile sources. Stationary-source emissions result from the consumption of natural gas and electricity. Mobile-source emissions result from vehicle trips and result in air pollutant emissions affecting the entire air basin. The Project would widen Airport Way from the existing two lanes to a six-lane arterial roadway. The Project would also include a raised median, a 5-foot Class II bike lane with curb and gutter, and a 6-foot sidewalk on either side of the street.

The Project includes roadway improvements that would maintain and improve travel efficiency on Airport Way. The Project is being constructed to serve existing traffic and would improve traffic levels of service (LOS) by relieving congestion and intersection delay. Therefore, the Project would not result in an increase in vehicle trips through the Project area. In addition, the Project would not be a source of stationary-source emissions. Therefore, once operational, the Project would not result in new emissions and thus would not exceed SJVAPCD-established significance thresholds. Therefore, operation of the Project would not be expected to result in a violation of air quality standards.

With implementation of the following mitigation measures, the Project will result in a less than significant impact.

Mitigation Measure AQ-1: All disturbed areas (including storage piles) that are not being actively utilized for construction purposes shall be effectively stabilized of dust emissions using water, a chemical stabilizer/suppressant, a tarp or other suitable cover, or vegetative ground cover.

Mitigation Measure AQ-2: All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or a chemical stabilizer/suppressant.

Mitigation Measure AQ-3: All land clearing, grubbing, scraping, excavation, land-leveling, grading, cut-and-fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by pre-soaking.

Mitigation Measure AQ-4: When materials are transported off site, all materials shall be covered or effectively wetted to limit visible dust emissions, and

at least 6 inches of freeboard space from the top of the container shall be maintained.

Mitigation Measure AQ-5: All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. The use of blower devices is expressly forbidden.)

Mitigation Measure AQ-6: Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or a chemical stabilizer/suppressant.

c. 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. CEQA defines a cumulative impact as two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. Therefore, if annual emissions of construction- or operation-related criteria air pollutants exceed any applicable threshold established by the SJVAPCD, the Project would result in a cumulatively significant impact. As discussed above, the Project's construction emissions of criteria pollutants are estimated to be below the emissions threshold established for the region. Operational emissions associated with the Project would not exceed SJVAPCD established significance thresholds for CO, NO_X, ROG, SO_X, PM_{10}, or $PM_{2.5}$ emissions. Therefore, the Project will not result in a cumulatively considerable contribution to regional air quality impacts and a less than significant impact will occur. No mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. Sensitive receptors are defined as people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day-care centers, nursing homes, hospitals, and residential dwelling units. The closest sensitive receptors include the single-family residences located adjacent to Airport Way, approximately 50 feet from the centerline of the outermost lane.

Construction activities associated with the Project may expose residents to airborne particulates and fugitive dust, as well as a small quantity of pollutants associated with the use of construction equipment (e.g., diesel-fueled vehicles and equipment), on a short-term basis. As shown in **Table 3-C,** Project construction would generate PM_{10} and $PM_{2.5}$ emissions that are below the SJVAPCD's significance criteria. Construction contractors would also be required to implement measures to reduce or eliminate emissions by following SJVAPCD Regulation VIII, as described above, thus minimizing possible exposure of these sensitive receptors to substantial pollutant

concentrations during construction. Additionally, due to the linear nature of the Project, construction activities at any one receptor location will occur for a limited duration.

The Project would widen Airport Way, locating the roadway closer to the residences and potentially increasing the health risk to those residences. With implementation of the Project, existing traffic volumes on Airport Way would be up to approximately 14,900 average daily trips and design year (2040) traffic volumes on Airport Way would be up to approximately 27,550 average daily trips. CARB has developed an *Air Quality and Land Use Handbook* (2005), which recommends taking steps to avoid siting sensitive land uses within 500 feet of major roadways with 100,000 vehicles per day. Therefore, as Airport Way would not accommodate daily vehicle trips that exceed CARB's Handbook screening protocol of 100,000 vehicles per day on an urban roadway, residences would not be exposed to substantial pollutant concentrations that would cause harmful effects. In addition, as discussed above, the Project would serve existing traffic and would improve LOS by relieving congestion and intersection delay, which would reduce health risks. Therefore, once the Project is constructed, it would not be a source of substantial emissions. Therefore, sensitive receptors are not expected to be exposed to substantial pollutant concentrations during Project construction or operation. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. During construction, the various diesel-powered vehicles and equipment in use on site would create localized odors. These odors would be temporary and are not likely to be noticeable for extended periods of time beyond the Project site. The potential for diesel odor impacts will therefore not be significant.

In addition, implementation of the Project would not change the use of the site and is not expected to produce any offensive odors that would result in frequent odor complaints. Therefore, the Project would not create objectionable odors affecting a substantial number of people and impacts will be less than significant. No mitigation is required.

3.4 BIOLOGICAL RESOURCES

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

3.4.1 Environmental Setting

Analysis was conducted for the Project to assess the site for compliance with the CEQA review process related to biological resource impacts. The following summarizes the biological setting in the Project vicinity.

3.4.1.1 Methods

For the purposes of this study, a Biological Study Area (BSA) was established. The BSA, totaling 15.2 acres, consists of the impact area (i.e., the Project footprint [limits of construction and access and staging areas]) and lands beyond the footprint that could potentially be affected by Project construction and/or were determined necessary to inventory in order to perform an adequate analysis of Project impacts.

A list of sensitive wildlife and plant species potentially occurring within the Project site was compiled to evaluate the potential impacts resulting from Project construction. Sources used to compile the list include the California Natural Diversity Database (CNDDB), the United States Fish and Wildlife Service online special-status species list, the California Native Plant Society Online Edition, and the

list of covered species in the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). The species lists obtained from the CNDDB, California Native Plant Society, and United States Fish and Wildlife Service, as well as the SJMSCP, were reviewed in July 2018 to determine which species could potentially occur on the Project site. LSA compiled and reviewed updated species lists in October 2019. Individual lists are included in **Appendix B: Species Lists**.

LSA conducted a general field survey within the BSA on July 24, 2018.

3.4.1.2 Results

The BSA is regionally situated in California's Central Valley, in the city of Manteca in southern San Joaquin County, which is generally characterized by large, flat areas of agricultural farmland with pockets of rural residential and industrial development. The BSA is located along Airport Way, which extends from Downtown Stockton in the north through the western edge of Manteca, and south through agricultural lands until it crosses the San Joaquin River and becomes Durham Ferry Road. The land use surrounding Airport Way through the BSA is mainly developed suburban neighborhood, remnant agricultural land (although most of the land that was formerly agricultural has been converted or sits vacant), a gas station at the north end, and a shopping center at the south end. An abundance of trees is within and adjacent to the BSA, most significantly a grove of large eucalyptus trees approximately 200 feet west of Airport Way.

The Project is within the Central Zone of the SJMSCP coverage area and would propose coverage under the SJMSCP. Three SJMSCP habitat types were identified in the BSA: agriculture, multi-purpose open space, and urban. No natural communities occur in the BSA, as shown on **Figure 4: SJMSCP Habitat Types and Compensation Areas.** Note that the SJMSCP habitat mapping may not reflect actual vegetative conditions in the BSA due to the relatively coarse level of detail required to map the entire county. However, for coverage under the SJMSCP, the Project is required to use the habitat classification mapping developed by the San Joaquin Council of Governments.

Agricultural lands, totaling 0.21 acre, are located in a narrow strip in the southwestern portion of the BSA, on the west side of Airport Way across from Wawona Street. The agricultural lands consist of a small area of cultivated grapes (*Vitis vinifera*), plums (*Prunus domestica*), and other fruiting trees.

Multi-purpose open space areas, totaling 1.46 acres, include areas of fallow agricultural land along Airport Way south of and east along Wawona Street. Representative species observed in these areas include Russian thistle (*Salsola tragus*), Italian thistle (*Lactuca serriola*), and black mustard (*Brassica nigra*).

Urban areas, totaling 3.58 acres, include established roadways (Airport Way, Wawona Street, and Yosemite Avenue), sidewalks, parking areas, and the private residences along the roadways. These areas are characterized by little to no vegetation in the roadways and exotic plant species associated with urban landscaping near the residences, such as Peruvian pepper tree (*Schinus molle*), oleander (*Nerium oleander*), and Mexican fan palm (*Washingtonia robusta*).

LSA

LEGEND

- Project Boundary - (15.20 ac)
- Elderberry Shrub

SJMSCP Habitat Type

- Agriculture - (0.21 ac)
- Multi-Purpose Open Space - (1.46 ac)
- Urban - (3.58 ac)

SJMSCP Compensation Areas*

- Agriculture - (0.21 ac @ $19,400 = $4,074)
- Multi-Purpose Open Space - (1.46 ac @ $9,701 = $14,163.46)

*Costs per 2018 SJMSCP Fee Schedule

0 200 400
FEET

FIGURE 4

Airport Way Widening Project
San Joaquin County, California
LSA Project No. MKT1603

SJMSCP Habitat Types and Compensation Areas

SOURCE: Basemap - Digital Globe Aerial Imagery (10/2017); Mapping - Manteca Veg Type Mapping (2011).

I:\MKT1603\GIS\Reports\ISMND\Fig4_Compensation.mxd (8/27/2018)

This page intentionally left blank

Special-status wildlife species that may occur in the BSA include Swainson's hawk (*Buteo swainsoni*), which is listed as threatened under the California Endangered Species Act, and burrowing owl (*Athene cunicularia*), a California Species of Special Concern.

A pair of Swainson's hawks was observed in the BSA during the survey, flying in and out of a eucalyptus grove approximately 200 feet west of the BSA and approximately 0.25 mile north of Wawona Street. A large stick nest was also observed in these eucalyptus trees, which may have been used by Swainson's hawks in the recent past, although no nesting activity was observed during the survey.

No burrowing owls or their sign were observed in the BSA during the survey. However, several California ground squirrels (*Otospermophilus beecheyi*) and their burrows were observed in the vacant lot west of Airport Way near its intersection with Daniels Street at the southern end of the BSA. While no owls or owl sign were observed at this location, the squirrel burrows provide suitable breeding habitat and the vacant lot provides suitable foraging habitat for burrowing owls. The nearest CNDDB record for burrowing owl is approximately 0.65 mile west of Airport Way and north of Yosemite Avenue and is presumed extant.

Two elderberry shrubs (*Sambucus nigra* ssp. *caerulea*) were observed near the BSA during the survey, behind a residence along Airport Way about 0.1 mile north of Daniels Street (see **Figure 4**). Access issues on the day of the survey prevented close inspection of the shrubs for sign of the presence of valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*). However, it is very unlikely that VELB are present in the shrubs due to the distance of the BSA from any riparian habitat. Furthermore, no CNDDB occurrences of VELB are from within 5 miles of the BSA.

No special-status plants are expected to occur in the BSA, and the BSA is not suitable habitat for special-status amphibians, reptiles, mammals, or fish.

No aquatic resources are within the BSA. The San Joaquin River is within 2.65 miles west of the BSA.

3.4.2 Impact Analysis

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

LESS THAN SIGNIFICANT WITH MITIGATION. Project activities would occur primarily within existing roadways and other areas designated as urban land use under the SJMSCP. However, areas within the BSA designated as agriculture or multi-purpose open space under the SJMSCP, and similar habitat immediately adjacent to the BSA, are potentially suitable for Swainson's hawk and burrowing owl, as described above. The Project will impact 0.21 acre of agricultural land and 1.46 acres of multi-purpose open space land. Therefore, these species could potentially be affected by the Project if present at the start of construction. Implementation of **Mitigation Measures BIO-1 and BIO-2,** pursuant to the SJMSCP Incidental Take Minimization Measures (ITMM) for these

species, will reduce potential impacts to Swainson's hawk and burrowing owl, respectively, to less than significant.

Mitigation Measure BIO-1: The measures listed below shall be implemented to mitigate potential impacts to Swainson's hawk:

1. Removal of suitable nest trees shall be completed during the non-nesting season (September 1 through February 15), when the nests are unoccupied.

2. If suitable nest trees will be retained and ground-disturbing activities will commence during the nesting season (February 16 through August 31), all suitable nest trees on the site will be surveyed by a qualified biologist prior to initiating construction-related activities. Surveys will be conducted no more than 14 days prior to the start of work. If an active nest is discovered, a 100-foot buffer shall be established around the nest tree and delineated using orange construction fencing or the equivalent. The buffer shall be maintained in place until the end of the breeding season or until the young have fledged, as determined by a qualified biologist. If no active nests are present, construction may proceed as planned.

3. In some instances, the California Department of Fish and Wildlife (CDFW) may approve decreasing the specified buffers with implementation of other avoidance and minimization measures (e.g., having a qualified biologist on site during construction activities during the nesting season to monitor nesting activity). If no nesting is discovered, construction can begin as planned. Construction beginning during the nonnesting season and continuing into the nesting season shall not be subject to these measures, but will still need to comply with the Migratory Bird Treaty Act and the California Endangered Species Act (which could include monitoring).

Mitigation Measure BIO-2: The measures listed below shall be implemented to mitigate potential impacts to burrowing owl:

1. The presence of ground squirrels and squirrel burrows is attractive to burrowing owls. Burrowing owls may therefore be discouraged from entering or occupying construction areas by discouraging the presence of ground squirrels. To accomplish this, the City should prevent ground squirrels

from occupying the BSA early in the planning process by employing one of the following practices.

a. The City may plant new vegetation or retain existing vegetation entirely covering the site at a height of approximately 36 inches above the ground. Vegetation should be retained until construction begins. Vegetation will discourage both ground squirrel and owl use of the site.

b. Alternatively, if burrowing owls are not known or suspected to occur in the BSA and the area is an unlikely occupation site for California tiger salamander, California red-legged frog, or San Joaquin kit fox, the City may disc or plow the entire BSA to destroy any ground squirrel burrows. At the same time burrows are destroyed, ground squirrels should be removed through one of the following approved methods to prevent reoccupation of the BSA:

    i. **Anticoagulants.** Establish bait stations using the approved rodenticide anticoagulants Chlorophacinone or Diphacinone. Rodenticides shall be used in compliance with the USEPA label standards and as directed by the San Joaquin County Agricultural Commissioner (SJAC).

    ii. **Zinc Phosphide.** Establish bait stations with nontreated grain 5 to 7 calendar days in advance of rodenticide application and then apply zinc phosphide to bait stations. Rodenticides shall be used in compliance with the USEPA label standards and as directed by the SJAC.

    iii. **Fumigants.** Use below-ground gas cartridges or pellets and seal burrows. Approved fumigants include aluminum phosphide (Fumitoxin, Phostoxin) and gas cartridges sold by the SJAC office. Note: Crumpled newspaper covered with soil is often an effective seal for burrows when fumigants are used. Fumigants shall be used in compliance with the USEPA label standards and as directed by the SJAC.

    iv. **Traps.** For areas with minimal rodent populations, traps may be effective for eliminating rodents. If trapping activities are required, the use of traps

shall be consistent with all applicable laws and regulations.

2. If the measures described above were not attempted or were attempted but failed, and burrowing owls are known to occupy the BSA, the following measures shall be implemented in accordance with the *Staff Report* (CDFW 2012):

   a. **Breeding season (February 1 through August 31):** Pre-construction surveys for burrowing owls will be performed no more than 14 days prior to initial ground-disturbing activities in accordance with the *Staff Report* (CDFW 2012).

      i. Any occupied burrows shall not be disturbed and shall be provided with a 250-foot protective buffer until the technical advisory committee, with the concurrence of the Permitting Agencies (representatives on the technical advisory committee)) or a qualified biologist approved by the Permitting Agencies verifies through non-invasive means that either: (1) the owls have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival.

      ii. Once the fledglings are capable of independent survival, a Burrowing Owl Exclusion Plan is developed and approved by the applicable CDFW SJMSCP representative/office, and habitat is mitigated in accordance with the Staff Report (CDFW 2012), the burrows can be destroyed. Pre-construction surveys following the destruction of burrows and prior to initial construction activities are recommended to ensure owls do not re-colonize the BSA.

      iii. If Project activities are delayed or suspended for more than 15 days during the breeding season, surveys will be repeated.

   b. **Nonbreeding season (September 1 through January 31):** Pre-construction surveys following the *Staff Report* (CDFW 2012) will be performed prior to initial ground-disturbing activities. Burrowing owls may be evicted

after a Burrowing Owl Exclusion Plan is developed and approved by the applicable CDFW SJMSCP representative/office and habitat is mitigated in accordance with the *Staff Report*.

Pre-construction surveys following the destruction of burrows and prior to initial construction activities are recommended to ensure owls do not re-colonize the BSA. If owls are found within 160 feet of the BSA, it is recommended that visual screens or other measures be implemented to limit disturbance of the owls without evicting them from the occupied burrows.

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

NO IMPACT. No riparian habitats or other sensitive natural communities are within the BSA. As noted above, no natural communities occur in the BSA. As such, no impact will occur with implementation of the Project and no mitigation is required.

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

NO IMPACT. No aquatic features are within the BSA. As such, no impact will occur with implementation of the Project and no mitigation is required.

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?

NO IMPACT. No evidence of substantial wildlife movement corridors was identified in the BSA. The BSA is heavily impacted by human activity (existing urban development, agriculture, traffic, etc.) and provides no connectivity with natural habitat in the vicinity. As such, no impact will occur with implementation of the Project and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The only local ordinance applicable to the Project is the Manteca Street Tree Plan described in Chapter 12.08 of the Manteca Municipal Code. The Project would result in the removal of 33 landscaping trees along Airport Way. The City would be responsible for replacing these trees consistent with the Manteca Street Tree Plan. As such, the Project will have a less than significant impact and no mitigation is required.

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

LESS THAN SIGNIFICANT WITH MITIGATION. The SJMSCP was established in November 2000 and provides guidelines for compensation for adverse impacts to designated habitat types (see **Figure 4**), as well as ITMMs to protect the listed sensitive species covered by the SJMSCP. The species covered by the SJMSCP that may potentially occur in the BSA include Swainson's hawk and burrowing owl. **Mitigation Measures BIO-1 and BIO-2** are consistent with ITMMs 5.2.4.11 and 5.2.4.15 in the SJMSCP. Therefore, the Project will not conflict with the provisions of the SJMSCP regarding conservation goals for Swainson's hawk and burrowing owl.

In addition to the species-specific protections, the SJMSCP also calls for compensation for impacts to designated habitat types. The Project will convert 0.21 acre of agricultural land and 1.46 acres of multi-purpose open space land to urban land uses. With implementation of **Mitigation Measure BIO-3,** the Project will not conflict with the provisions of the SJMSCP or other approved local, regional, or State habitat conservation plans (HCP).

Mitigation Measure BIO-3: This measure shall be implemented to comply with provisions of the SJMSCP.

The Project shall provide compensation for the loss of designated habitat types suitable to support special-status species. Compensation shall be calculated using the most current SJMSCP fee schedule.

Compensation costs for these coverage types are set according to the 2018 SJMSCP Fee Schedule.

3.5 CULTURAL RESOURCES

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

3.5.1 Environmental Setting

A Cultural Resources Study (LSA 2018a) was conducted to: (1) identify cultural resources in the Project site that may meet the definition of a historical resource (California Public Resources Code [PRC] §21084.1) or unique archaeological resource (PRC §21083.2(g)); (2) identify human remains in the Project site; (3) assess potential impacts to such resources and remains; and (4) provide mitigation recommendations that would avoid or substantially reduce the severity of such impacts. The study consisted of records and sacred lands searches, a literature review, a historic map review, outreach to interested parties, and a field survey.

The Project is located along Airport Way in Section 36 of Township 1 South, Range 6 East, and Section 1 of Township 2 South, Range 6 East, of the Mount Diablo Baseline and Meridian. For the *Cultural Resources Study,* LSA analyzed the roadway and all adjacent parcels, taking into account all areas in which the Project could potentially affect cultural resources, either directly or indirectly.

The Project site includes 29 parcels that contain built environment resources over 50 years old. Eleven of the 29 parcels contained resources set far enough back from the Project design that the Project will not result in significant impacts. The Project has the potential to result in substantial adverse changes to 10 resources and indirect impacts to 8 resources. The 18 built-environment resources were evaluated to determine if they meet the definition of a historical resource under CEQA in order to determine if the Project would have significant impacts to cultural resources.

Furthermore, one linear resource over 50 years old—the PG&E Manteca-Vierra transmission line and associated lattice steel tower 1/13—was identified within the Project site. The Project proposes to relocate the transmission tower approximately 10.5 feet east of its current location. Segments of the Manteca-Vierra transmission line were evaluated in other parts of San Joaquin County and determined not eligible for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR). The segment within the Project site appears to be ineligible for listing in the CRHR and is not a historical resource for the purposes of CEQA. Furthermore, the relocation area is close enough to the tower's original location that it would not affect the overall alignment of the resource.

A cultural resources records search of the Project site (Central California Information Center [CCaIC]) #9604N) was conducted on January 19, 2016, at the CCaIC of the California Historical Resources Information System to identify previous cultural resources studies and site records for the Project

site and vicinity. The CCaIC, an affiliate of the California Office of Historic Preservation (OHP), is the official State repository of cultural resources records and reports for San Joaquin County. The search consisted of a review of records for archaeological and built-environment cultural resources and cultural resources studies within the Project site and a 0.5-mile radius.

As part of the records search, LSA also reviewed the following State of California inventories for cultural resources in and adjacent to the Project site:

- California Inventory of Historic Resources (OHP 1976);
- *Five Views: An Ethnic Historic Site Survey for California* (OHP 1988);
- California Points of Historical Interest (OHP 1992);
- California Historical Landmarks (OHP 1996); and
- Directory of Properties in the Historic Property Data File (OHP 2012). This directory includes the listings of the NRHP, National Historic Landmarks, CRHR, California Historical Landmarks, and California Points of Historical Interest.

The CCaIC records search identified 5 cultural resource investigations conducted within the Project site and an additional 10 cultural resource investigations within 0.5 mile of the Project. These investigations did not identify any cultural resources within the Project site. One cultural linear resource—P-39-000103—was identified within 0.5 mile of the Project site. This resource is a historic-period linear drainage ditch recorded in 1993 and is associated with the South San Joaquin Irrigation District (SSJID) (JRP and Caltrans 1993).

On October 30, 2018, a pedestrian archaeological survey of the Project site was conducted. The pedestrian survey was conducted in zigzag transects covering areas of ground visibility. The purpose of the survey was to identify any unrecorded cultural resources that may be impacted by the Project. Overall, ground visibility within the Project site was nearly 20 percent limited by existing pavement and annual grasses. Throughout the Project site, the soil consisted of loamy sand loosely compacted on vacant land due to recent disking and more compacted in landscaped areas such as front yards of residences. The road shoulders along the alignment of Airport Way consisted primarily of road fill or other imported fill from utility installation, as evidenced by several manholes and fire hydrants along this corridor.

Two foundation pads were identified (LSA-SAW-001) during the pedestrian survey southwest of the Yosemite Avenue/Airport Way intersection (APN 241-300-17). The larger foundation pad (Feature 1), located in the northwest quadrant of the property, measures approximately 20 feet wide (east to west) and 60 feet long (north to south). The smaller foundation pad (Feature 2) is 20 square feet and centrally located within the property. LSA confirmed the 18 built-environment resources were still present in the Project site. The field survey was documented in photographs and notes.

After a records search, literature review, historic map review, consultation outreach, and field survey, no cultural resources in the Project site were identified that meet the definition of a historical resource or unique archaeological resource under CEQA. However, the potential for the

Project's construction-related activities to encounter significant subsurface cultural resources during construction is high, particularly in areas that have not been previously developed. Previous disturbances in the immediate Project site include existing infrastructure such as utilities to accommodate historic-period and modern development. Utility disturbances appear to have been mostly confined to the immediate roadway prism. A vast majority of the Project will be confined to the Airport Way road prism. Areas within the Project site that are not currently developed have the possibility of impacting native, previously undisturbed soil, which has the potential to contain intact archaeological deposits. Since the Project may impact these areas, previous ground disturbance does not preclude the chance of encountering an intact archaeological deposit.

3.5.2 Impact Analysis

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

LESS THAN SIGNIFICANT WITH MITIGATION. No historical resources were identified during preparation of the *Cultural Resource Study.* However, the potential for the Project's construction-related activities to encounter significant subsurface cultural resources during construction is high, particularly in areas that have not been previously developed. If any previously unidentified historical resources are found, implementation of **Mitigation Measure CULT-1** will reduce Project impacts to a less than significant level.

Mitigation Measure CULT-1: If deposits of prehistoric or historical archaeological materials are encountered during Project activities, all work within 50 feet of the discovery should be redirected and a qualified archaeologist contacted to assess the situation and make recommendations regarding the treatment of the discovery. Project personnel should not collect or move any archaeological materials or human remains and associated materials.

Archaeological cultural resources should be avoided by Project activities. If such resources cannot be avoided, they should be evaluated for their CRHR eligibility, under the direction of a qualified professional archaeologist, to determine if they qualify as a historical resource under the CEQA. If the deposit is not eligible, a determination should then be made as to whether it qualifies as a unique archaeological resource under CEQA. If the deposit is not a historical or unique archaeological resource, avoidance is not necessary. If the deposit is eligible for the CRHR or is a unique archaeological resource, it will need to be avoided by Project actions that may result in impacts, or such impacts must be mitigated. Mitigation may consist of, but is not limited to, recording the resource; recovery and analysis of archaeological deposits; preparation of a report of findings; and accessioning recovered archaeological materials at an appropriate curation facility. Public educational outreach may

also be appropriate. Upon completion of the study, the archaeologist should prepare a report documenting the methods and results of the investigation and provide recommendations for the treatment of the archaeological materials discovered. The report should be submitted to the City and the Central California Information Center.

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

LESS THAN SIGNIFICANT WITH MITIGATION. No archaeological resources were identified in the *Cultural Resource Study*. However, the potential for encountering previously unidentified buried archaeological cultural resources in the Project site is high based on the geological landforms and soils present on site. Areas within the Project site that are not currently developed have the possibility of impacting native, previously undisturbed soil, which has the potential to contain intact archaeological deposits. Since the Project may impact these areas, previous ground disturbance does not preclude the chance of encountering an intact archaeological deposit. If any previously unidentified archaeological resource is found, implementation of **Mitigation Measure CULT-1** will reduce Project impacts to a less than significant level.

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

LESS THAN SIGNIFICANT WITH MITIGATION. Although the field survey did not indicate the presence of cultural resources or human remains, Native American skeletal remains could potentially be identified in the Project site during construction. In the event of accidental discovery of human remains, implementation of **Mitigation Measure CULT-3** will reduce Project impacts to a less than significant level.

Mitigation Measure CULT-3: If human remains are discovered during Project activities, the specific protocol outlined by Section 7050.5 of the Health and Safety Code should be followed. Work within 50 feet of the discovery shall be redirected and the San Joaquin County Coroner notified immediately. Project personnel should not collect or move any human remains and associated materials. If the Coroner determines that the remains are not subject to his/her authority, and if the Coroner recognizes the remains to be those of a Native American or has reason to believe that they are those of a Native American, s/he will contact the Native American Heritage Commission (NAHC) by telephone within 24 hours.

The NAHC shall identify the person or persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD may make recommendations to the City or the person responsible for the excavation work for means of

treating or disposing of, with appropriate dignity, the human remains and any associated grave goods, as provided in PRC §5097.98.

The archaeologist shall prepare a report that provides recommendations for the treatment of the human remains and any associated cultural materials, as well as proposed or implemented methods and results from excavation and analysis. Treatment of the remains and associated cultural materials should be done in coordination with the recommendations of the MLD and the City. The report should be submitted to the City for review and comment. The final report should be submitted to the Northwest Information Center of the California Historical Resources Information System.

3.6 ENERGY

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

3.6.1 Environmental Setting

The City of Manteca is located within San Joaquin County, California. The California Energy Commission (CEC) provides electricity and natural gas consumption data in California and by County. Based on the CEC, in 2018, California consumed approximately 281,120 gigawatt-hours or 281,120,000,000 kilowatt hours.[2] Of this, San Joaquin County consumed 5,629 gigawatt-hours or 5,629,000,000 kilowatt hours.[3] In addition, in 2018, California consumed approximately 12,638 million therms or 12,638,000,000 therms, while San Joaquin County consumed approximately 246 million therms or approximately 246,000,000 therms.[4]

The average fuel economy for light-duty vehicles (autos, pickups, vans, and sport utility vehicles) in the United States has steadily increased from about 14.9 miles per gallon in 1980 to 22.0 miles per gallon in 2015. In 2015, vehicles in California consumed approximately 15.1 billion gallons of gasoline.[5]

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

The CEC recently adopted the 2017 Integrated Energy Policy Report. The 2017 Integrated Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California.

[2] California Energy Commission. Energy Consumption Data Management Service. Electricity Consumption by County. Website: http://www.ecdms.energy.ca.gov/elecbycounty.aspx (accessed October 2019).
[3] Ibid.
[4] California Energy Commission. Energy Consumption Data Management Service. Gas Consumption by County. Website: http://www.ecdms.energy.ca.gov/gasbycounty.aspx. (accessed October 2019).
[5] California Energy Commission. California Gasoline Data, Facts, and Statistics. Website: http://www.energy.ca.gov/almanac/transportation_data/gasoline/ (accessed October 2019).

Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining reliability and controlling costs.

3.6.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. The proposed Project will include the widening of Airport Way from two lanes (one lane in each direction) to six lanes (three lanes in each direction). Construction activities associated with the Project will require consumption of energy resources, which include but are not limited to, the use of gasoline powered construction equipment. However, best management practices such as limiting construction equipment idling will ensure energy use is efficient and not wasteful or unnecessary. Once operational, the Project will reduce congestion along Airport Way, thus improving energy consumption through reduced traffic related idling. As such, implementation of the proposed Project will not result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during construction and operation. Impacts will be less than significant and no mitigation is required.

b. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

LESS THAN SIGNIFICANT IMPACT. In October 2013, the City of Manteca adopted a Climate Action Plan, which is the primary strategy for the City ensuring that the buildout of the General Plan 2023 supports the goals of AB 32 (the Global Warming Solutions Act of 2006). The proposed Project is being implemented to reduce congestion along Airport Way for future buildout of the City. The widening of Airport Way will reduce congestion and thus reduce energy use in the vehicles using the widened road, as vehicles will not be idling in traffic. The proposed Project will not conflict with or obstruct a state or the local Manteca Climate Action Plan for renewable energy of energy efficiency. Impacts will be less than significant and not mitigation is required.

3.7 GEOLOGY AND SOILS

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

3.7.1 Environmental Setting

3.7.1.1 Geology

Manteca is located in the San Joaquin Valley, within the Great Valley Geomorphic Province. The Great Valley, or Central Valley, is bordered by the Tehachapi Mountains, the Klamath Mountains, the Sierra Nevada, and the Coast Ranges. The valley is composed of sedimentary rock sequences deposited up to 130 million years ago. Manteca's elevation ranges from 20 to 50 feet above sea level and is relatively flat with a gentle slope from east to west (City of Manteca 2017).

3.7.1.2 Soils

The City of Manteca Existing Conditions Report includes a custom soil survey using the NRCS Web Soil Survey program. The Project area includes Bisgani loamy coarse sand, Delhi loamy sand, Timor loamy sand, Tinnin loamy coarse sand, and Veritas fine sandy loam. Slopes within the Project area are 0 to 2 percent. Descriptions of the soil types within the Project site are provided below (City of Manteca 2017).

- **Bisgani loamy coarse sand** is formed in mixed alluvium primarily from granitic sources and is found on bars, floodplains, low alluvial fans, basin floors, and valley basins. These soils are very deep and poorly drained, and they have negligible runoff and rapid permeability (USDA 2003).

- **Delhi loamy sand** is formed from wind-modified material weathered from granitic rock sources and is found on floodplains, alluvial fans, and terraces. It consists of deep, somewhat excessively drained soils and has negligible to slow runoff and rapid permeability (City of Manteca 2017).

- **Timor loamy sand** is formed in granitic alluvium and is found on low fan terraces or alluvial fans. It consists of deep, moderately well drained soils and has slow runoff and rapid permeability (City of Manteca 2017).

- **Tinnin loamy coarse sand** is formed from granitic alluvium sources and is found on low fan terraces and alluvial fans. The soils are deep and well drained, with slow runoff and rapid permeability (City of Manteca 2017).

- **Veritas fine sandy loam** is formed in alluvium derived from mixed rock sources and is found on low fan terraces. It consists of deep to duripan, moderately well-drained soils and has slow runoff and moderately rapid permeability (City of Manteca 2017).

Expansive Soils. Expansive soils shrink and harden when dried and expand and soften when wet. Foundation systems built on expansive soils must be capable of tolerating or resisting soil expansion. According to the NRCS Web Soil Survey, soils within the Project site are classified as having low shrink-swell potential (City of Manteca 2017).

Erosion. Erosion naturally occurs as rock, soil, debris, and other surface materials are loosened, dissolved, or worn away and then transported from one place to another by gravity. The erosion factor K indicates the vulnerability of a soil to sheet and rill erosion by water and ranges from values of 0.02 to 0.69. The erosion factor K varies from 0.02 to 0.37 within Manteca and is considered low to moderate. In addition, the drainage characteristics and flat topography of the area reduce the water erosion hazard to low. The potential of wind erosion within Manteca ranges from moderate to high in the spring, summer, and fall but decreases in the winter (City of Manteca 2017).

Collapsible Soils. Collapsible soils experience a rearrangement of their grains and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. In the event of an earthquake, significant damage from differentially settled structures can occur as a result of slight settlement of fill materials. No collapsible soils are identified within the Project area. However, the potential exists for liquefaction-induced settlement in areas subject to liquefaction (City of Manteca 2017).

Subsidence. The gradual settling or sinking of an area with little or no horizontal motion caused by changes taking place underground is known as subsidence. Subsidence is a natural process but can also occur or be accelerated by human activity. According to the City of Manteca General Plan Existing Conditions Report, subsidence is not an issue within the Project area (City of Manteca 2017).

3.7.1.3 Seismicity

The United States Geological Survey has identified three active faults in proximity to Manteca. An unnamed fault is located 5 miles west of Manteca, the San Joaquin fault is approximately 15 miles southwest of the city, and the Midway fault is approximately 20 miles west of the city (City of Manteca 2017).

No significant earthquakes have been identified in Manteca; however, significant earthquakes have been documented in the surrounding region. The California Geological Survey's Probabilistic Seismic Hazard Assessment Program has identified San Joaquin County to be within an area that is predicted to have a 10 percent probability that a seismic event would produce horizontal ground shaking of 10 to 20 percent, or Modified Mercalli intensity of V to VII, within a 50-year period (City of Manteca 2017).

The Alquist-Priolo Special Studies Zone Act was passed by the California legislature in 1972 in response to seismic hazards associated with faults. Faults that are determined to be active by the California Geological Survey are typically incorporated into a Special Studies Zone and require site-specific evaluation of the fault location and a structure setback if the fault is found to traverse a project site. The Project site does not include an Alquist-Priolo Special Study Zone. The Greenville Fault Zone, located 25 miles southwest of Manteca, is the nearest Alquist-Priolo Fault Zone (City of Manteca 2017).

Seismic Hazards

Seismic Ground Shaking. Seismic ground shaking is expected in California. Therefore, the California Building Code requires special design provisions for all structural improvements (City of Manteca 2017).

Fault Rupture. Fault ruptures occur when the surface of the earth breaks as a result of an earthquake. This generally occurs at a weak area of an existing fault and can be either sudden or slow. No surface expression of active faults is within the Project area and fault rupture is not anticipated (City of Manteca 2017).

Liquefaction. A sudden decrease of shearing resistance in cohesionless soils and a sudden increase in water pressure, generally associated with an earthquake of high magnitude, may result in liquefaction. Due to the City's moderately high water table and high composition of sand in many soils, the NRCS Web Soil Survey indicates a low to high potential for liquefaction within Manteca (City of Manteca 2017).

Landslides. Geological conditions, drainage, slope, vegetation, and other factors affect the potential for landslides. In addition, construction activity, such as road building, is a common cause of landslides due to cut and fill practices. The landscape within Manteca and the Project area is topographically flat; therefore, there is a low potential for landslides (City of Manteca 2017).

3.7.2 Impact Analysis

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

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
ii. Strong seismic ground shaking?
iii. Seismic-related ground failure, including liquefaction?
iv. Landslides?

LESS THAN SIGNIFICANT IMPACT. The Project site does not located on an Alquist-Priolo fault zone or on a surface expression of active faults, and fault rupture is not anticipated. The potential for seismic ground shaking is expected; however, the Project would include special design considerations for all structural improvements, in accordance with the California Building Standards Code, to enhance structural integrity and reduce seismic ground shaking impacts. The water table is moderately high, and soil within the Project site consists of primarily sand. Therefore, a potential for liquefaction exists within the Project site. Compliance with California Building Standards Code will increase structural integrity and minimize risks. The Project area is topographically flat; therefore, the potential for landslides is low. The Project will not directly or indirectly expose people or structures to potential substantial adverse effects above existing conditions. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project would include excavation to widen the existing roadway and to construct drainage basins. Temporary wind erosion may occur as a result of excavation and construction. The Project is subject to the requirements set forth by the California Building Standards Code, which regulates grading activities, including drainage and erosion control. Once operational, soil erosion potential is expected to be low as the Project area is relatively flat and includes permeable soils with slow runoff. The Project will not result in substantial soil erosion or loss of topsoil. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project site is in an essentially flat area in Manteca. The risk of lateral spreading and subsidence is low, and collapsible soils have not been identified within the Project site or surrounding city. Due to the flat topography of Manteca, the potential for landslides is low. The city contains soils high in sand and the water table is moderately high; therefore, the potential for liquefaction is moderate to high. However, the Project would not increase the risk of liquefaction above existing conditions. The Project's impacts on on-site or off-site landslide, lateral

spreading, subsidence, liquefaction, or collapse will be less than significant. No mitigation is required.

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

NO IMPACT. The Project site is located on soils with low shrink-swell potential. Therefore, no impacts associated with expansive soils creating substantial direct or indirect risks to life or property will occur. No mitigation is required.

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

NO IMPACT. The Project does not include the use of septic tanks or alternative waste water disposal systems. The Project includes the widening of an existing roadway and would not generate wastewater once operational. The Project will have no impacts on the area's ability to support the use of septic tanks or alternative waste water disposal systems. No mitigation is required.

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

LESS THAN SIGNIFICANT WITH MITIGATION. The Project site lies in the northeastern San Joaquin Valley at the base of the Sierra Nevada foothills, within the Great Valley Geomorphic Province (California Geologic Survey 2002). The Project vicinity is underlain by Pleistocene to Holocene quaternary alluvium and marine deposits. Geologic mapping previously conducted for recent projects within the Project vicinity, such as the McKinley Avenue/SR-120 interchange and the SR-99/SR-120 Connector, indicate that the Project area is underlain by the Modesto Formation. The Modesto Formation has the potential to yield important paleontological resources and therefore has high paleontological sensitivity. The Project site includes an existing roadway and has been previously developed. No paleontological resources or unique geologic features are known to exist within the Project site. However, should paleontological resources be discovered during Project construction, implementation of **Mitigation Measure GEO-1** would reduce potential impacts to paleontological resources to a less than significant level.

Mitigation Measure GEO-1: If paleontological resources are encountered during Project subsurface construction and no monitor is present, all ground-disturbing activities shall be redirected within 50 feet of the find until a qualified paleontologist can be contacted to evaluate the find and make recommendations. If the paleontological resources are found to be significant and proposed Project activities cannot avoid the resources, a paleontological evaluation and monitoring plan, as described above, shall be implemented. Adverse impacts to paleontological resources shall be mitigated, which may include monitoring, data recovery and analysis, a final report, and the accession of all fossil

material to a paleontological repository. Upon completion of Project ground-disturbing activities, a report documenting methods, findings, and recommendations shall be prepared and submitted to the paleontological repository.

3.8 GREENHOUSE GAS EMISSIONS

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

3.8.1 Environmental Setting

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose 0.6 ± 0.2° Celsius (°C) or 1.1 ± 0.4°F in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other greenhouse gases (GHGs) are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.[6]

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- CO_2
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, believed to be causing global warming. While man-made GHGs include naturally occurring GHGs such as CO_2, CH_4, and N_2O, some gases, like HFCs, PFCs, and SF_6, are completely new to the atmosphere.

[6] The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, GHGs like CO_2, CH_4, and N_2O in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the naturally occurring greenhouse effect is necessary to keep our planet at a comfortable temperature.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation. For the purposes of this air quality analysis, the term "GHGs" will refer collectively to the six gases listed above only.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas in absorbing infrared radiation and the length of time the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e). **Table 3-D: Global Warming Potential of Greenhouse Gases** shows the GWP for each type of GHG. For example, SF_6 is 22,800 times more potent at contributing to global warming than CO_2.

Table 3-D: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-Year Time Horizon)
Carbon Dioxide	50–200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoromethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: Intergovernmental Panel on Climate Change. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC* (2007).
HFC = hydrofluorocarbon
PFC = perfluorocarbon

3.8.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. Construction activities associated with the Project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, Lead Agencies are encouraged to quantify and disclose GHG emissions that would occur during construction.

Using Roadmod, it is estimated that the Project would generate approximately 2,672.2 metric tons of CO_2e during the construction period. Implementation of SJVAPCD Regulation VIII measures would further reduce GHG emissions during the construction period to ensure impacts remain less than significant.

The Project would widen Airport Way from the existing two lanes to a six-lane arterial roadway. The Project would also include a raised median, a 5-foot Class II bike lane, and a 6-foot sidewalk with curb and gutter on either side of the street.

Since the Project includes improvements that would maintain and improve travel efficiency on Airport Way, the Project would not result in an increase in vehicular trips through the Project area. Therefore, once completed, the Project would not generate any GHG emissions or result in any new vehicle trips that would contribute to an increase in GHG emissions. In addition, implementation of the Project would result in decreased traffic congestion and idling time along the Project corridor; therefore, the Project is expected to generate similar or reduced GHG emissions than what would occur under existing conditions. Operation of the Project would not generate substantial GHG emissions. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The City adopted a Climate Action Plan (CAP) on October 15, 2013. The CAP is designed to (1) outline a course of action for the City government and the community of Manteca to reduce per-capita GHG emissions by amounts required to show consistency with AB 32 goals for the year 2020 and adapt to the effects of climate change; (2) provide clear guidance to City staff regarding when and how to implement key provisions of the CAP; and (3) provide a streamlined mechanism for projects that are consistent with the CAP to demonstrate that they would not contribute significant GHG impacts (City of Manteca 2013a).

The Project's GHG emissions would not be considered a significant impact if the Project were consistent with the strategies included in the City's CAP. The majority of the City's CAP strategies are specific to development projects; however, some of the strategies would be applicable to the Project. Therefore, this analysis evaluates the Project's consistency with the City's CAP. The Project's consistency with the relevant CAP strategies is discussed below in **Table 3-E: Project Consistency with Climate Action Plan Strategies.**

Table 3-E: Project Consistency with Climate Action Plan Strategies

Climate Action Plan Strategy	Project Compliance with Strategy
Land Use and Transportation Strategies	
POD-1: During the review of subdivision maps and site plans, the City shall ensure that project designs provide internal and external pedestrian connections where appropriate.	***Consistent*.** The Project would include a 6-foot sidewalk on either side of the street.
POD-2: The City shall require sidewalks and/or pedestrian paths in all residential projects. The sidewalks should be wide enough to allow side-by-side walking and room for passing to increase comfort and convenience for walkers (5 to 6 feet).	***Consistent*.** The Project is not a residential project; however, the Project would include a 6-foot sidewalk on either side of the street.
PI-1: The City shall ensure that all projects comply with the General Plan policies regarding pedestrian infrastructure during the development review process.	***Consistent*.** The Project would include a 6-foot sidewalk on either side of the street.
BI-1: The City shall review all projects to ensure they comply with relevant General Plan policies and the Bicycle Master Plan.	***Consistent*.** The Project would include a 5-foot Class II bike lane on either side of the street.
TC-2: The City shall review all projects to ensure compliance with the "Complete Streets" requirements regarding traffic calming and pedestrian improvements.	***Consistent*.** The Project would include a 5-foot Class II bike lane and a 6-foot sidewalk on either side of the street.
Energy Conservation Strategies	
WC-1: The City shall continue to implement water conservation measures to comply with the Model Water Efficient Landscape requirements that implement the Water Conservation in Landscaping Act of 2006 (Assembly Bill 1881, Laird).	***Consistent*.** Any landscaping associated with the Project would be required to comply with the Model Water Efficient Landscape requirements.
Waste Diversion and Recycling and Energy Recovery Strategies	
MWC-1: The City will use recycled water in public landscaped areas when feasible.	***Consistent.*** Current plans for the Project do not determine whether the Project would use recycled water in landscaped areas. However, to maintain the existing drainage pattern and comply with stormwater quality requirements, both the four-lane phase and the ultimate six-lane facility include construction of percolation basins for on-site stormwater treatment. The design and construction of the percolation basins would comply with the City's Storm Drain Master Plan, with capacity to detain the stormwater runoff volume of a 10-year, 48-hour-duration storm within 96 hours.
MWC-2: The City will install higher efficiency irrigation systems, precision sprinklers, moisture sensors, and drip irrigation where the landscaping permits these systems and budget allows.	***To be determined.*** Current plans for the Project do not determine whether the Project would install higher-efficiency irrigation systems, precision sprinklers, moisture sensors, or drip irrigation where the landscaping permits.
MWC-3: The City will replace existing water-intensive landscape installations (e.g., turf in medians) with more water-efficient alternatives where feasible.	***To be determined.*** Current plans for the Project do not determine whether proposed medians would include water-efficient landscaping.

Source: LSA (September 2018).

As demonstrated in **Table 3-E**, the Project would be consistent with the City's CAP. The Project would not result in a substantial increase in GHG emissions and therefore would be consistent with the CAP. Therefore, the Project would not conflict with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. In addition, the Project would not result in a substantial increase in GHG emissions. Impacts will be less than significant and no mitigation is required.

3.9 HAZARDS AND HAZARDOUS MATERIALS

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

3.9.1 Environmental Setting

Hazardous material is defined as a substance or combination of substances that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety or the environment when improperly treated, stored, transported, or disposed. *Hazardous waste* is the subset of hazardous material that has been abandoned, discarded, or recycled and is not properly contained (City of Manteca 2017).

The Project site is not listed in the EnviroStor database. No sites within the Project footprint were listed in the State Water Resources Control Board GeoTracker database. However, one leaking underground storage tank (LUST) and two permitted underground storage tanks are within 150 feet of the Project site. Frank's One Stop, located at 2072 West Yosemite Avenue in Manteca, is an active LUST currently undergoing cleanup. As of October 29, 2012, the site's cleanup status is open and verification monitoring is ongoing. Cagasoline Express, located at 2115 West Yosemite Avenue, and Quick Shop, located at 2072 West Yosemite Avenue, are underground storage tanks permitted by the San Joaquin County Environmental Health Department.

Aerially deposited lead (ADL) from the historical use of leaded gasoline has resulted in elevated lead concentrations in soil along heavily used roadways. Although the use of leaded gasoline was banned in the 1980s, lead buildup still exists throughout California. The California Department of Toxic Substances Control has determined that soil containing lead with levels below 80 parts per million is appropriate for use without restrictions at any property.

The Project includes the widening of Airport Way between just north of Yosemite Avenue and north of Daniels Street. Existing land uses along Airport Way primarily include residential, commercial, and agricultural uses. Minimal industrial land use is present within the Project site. Based on the land uses of the site, a history of low-level vehicle use is expected within the Project site. Therefore, levels of ADL are expected to be low. In addition, environmental review of nearby project developments, including the SR-120/McKinley Avenue Interchange and SR-120/Union Road Interchange projects, indicate concentration levels of ADL at below restricted use levels.

Existing thermoplastic striping within the Project area may contain lead-based paint. Caltrans advises that yellow traffic paint used prior to 1997 contained high concentrations of lead. Removal of thermoplastic striping may result in a potential exposure to lead-based paint.

3.9.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. Construction of the Project would include the incidental transport and use of hazardous materials, including oils, lubricants, fuels, and specific building materials such as concrete and asphalt. The transport and use of such hazardous materials would be subject to State hazardous waste regulations, including California Code of Regulations, Title 22, and rules and regulations set by the California Occupational Health and Safety Administration. Compliance with State regulations would result in a less than significant risk to the public and the environment. Once operational, the Project would not include routine transport, use, or disposal of hazardous materials. Impacts will be less than significant and no mitigation is required.

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 WITH MITIGATION. During construction, the Project would include the use of hazardous materials such as oils, lubricants, fuels, and specific building materials such as concrete and asphalt. Use, transport, storage, and disposal of such materials would be subject to State and local regulations, and if conducted in accordance with such regulations, would not impose any foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Use of hazardous materials would be temporary during construction of the Project and would not occur once the Project is operational. Construction of the Project may include potential exposure to ADL and lead-containing traffic striping. Exposure potential to lead would be temporary and would not occur once the Project is operational. Implementation of **Mitigation Measures HAZ-1** and **HAZ-2** will reduce impacts to a less than significant level.

Mitigation Measure HAZ-1: The contractor shall prepare a Spill Prevention and Countermeasure Plan (SPCP). The SPCP must be submitted to the City for review and approval prior to the commencement of construction activities. The SPCP shall include information on the nature of all hazardous materials that would be used on site. The SPCP shall also include information regarding the proper handling of hazardous materials and cleanup procedures in the event of an accidental release. The phone number of the agency overseeing hazardous materials and toxic waste cleanup shall be provided in the SPCP.

Mitigation Measure HAZ-2: The contractor shall prepare a worker training program for potential exposure to ADL and/or lead-based traffic striping. Training should include guidelines that prevent or minimize worker exposure to lead in on-site soils and traffic striping. The training shall include (but not be limited to) protocols for environmental and personal monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of soils.

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

LESS THAN SIGNIFICANT WITH MITIGATION. Sierra High School is located approximately 0.14 mile from the Project site. During construction, the Project would include the use of common hazardous materials; however, compliance with State and local regulations regarding hazardous materials would reduce the risk of hazard to the public or existing schools. Implementation of **Mitigation Measure HAZ-1** will reduce this impact to a less than significant level.

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?

LESS THAN SIGNIFICANT IMPACT. No hazardous material sites are within the Project footprint. However, three hazardous material sites are within 150 feet of the Project footprint. Frank's One Stop, located at 2072 West Yosemite Avenue, is listed as an LUST. The site's cleanup status is open for verification monitoring as of October 29, 2012. Two permitted underground storage tanks are within 150 feet of the Project footprint. Cagasoline Express is located at 2115 West Yosemite Avenue, and Quick Shop is located at 2072 West Yosemite Avenue. The Project would not include any drilling or excavating at these locations and therefore would not create any significant hazard to the public or the environment. Impacts will be less than significant and no mitigation is required.

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

NO IMPACT. The Project site is not within 2 miles of an airport land use plan, public airport, or public use airport. As such, implementation of the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area. No impact will occur and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project includes the widening of an existing roadway and would not result in any reduction of arterial roadways. The Project would improve existing traffic circulation and would benefit emergency response. The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Impacts will be less than significant and no mitigation is required.

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

NO IMPACT. The Project includes the widening of an existing roadway and would not result in an extension or new roadway. The Project site is within a Local Responsibility Area, but is not categorized as a "Very High" fire hazard severity zone. The Project would have no impact on the proximity of wildlands to urbanized areas or rural residences. Therefore, the Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. No impact will occur and no mitigation is required.

3.10 HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water 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 offsite;	☐	☐	☐	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☐	☐
iii. create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;	☐	☐	☐	☐
iv. impede or redirect flood flows?	☐	☐	☐	☐
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

3.10.1 Environmental Setting

The Project site is in Manteca, within the San Joaquin River watershed. The San Joaquin River originates in the Sierra Nevada and flows northwest through the Central Valley to the Sacramento-San Joaquin Delta, where it meets the Sacramento River. The river's primary water source is snowmelt. The Project site falls within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB).

3.10.1.1 Surface Water

The Project site includes two hydrologic sub-areas. South of Yosemite Avenue, the Project site is within the Oakwood Lake-San Joaquin River hydrologic sub-area; north of Yosemite Avenue, the Project site is within the Town of French Camp-San Joaquin River hydrologic sub-area (City of Manteca 2017).

3.10.1.2 Groundwater

Manteca is located in the Eastern San Joaquin River Groundwater basin. Most of the groundwater is found at shallow levels of less than 1,000 feet and is primarily unconfined. The average total

groundwater pumping is about 8,000 acre-feet per year. In addition, the sustainable yield of the basin is approximately 1 acre-foot per acre per year (City of Manteca 2017).

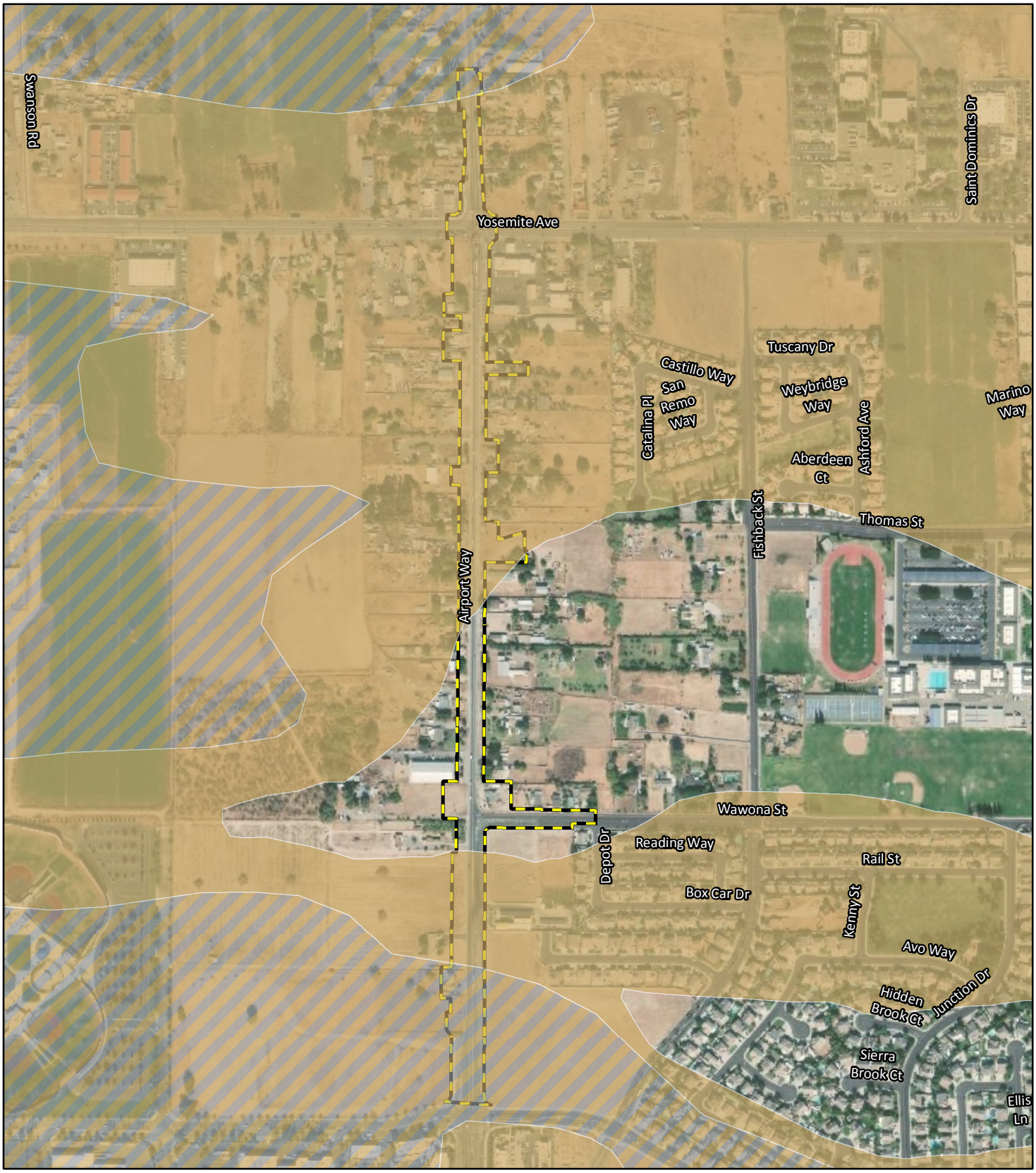
3.10.1.3 Recycled Water

The City of Manteca General Plan 2023 Policy Document identifies the City's water conservation goal to maximize the beneficial uses of water by recycling water for irrigation and other nonpotable uses. According to the City's General Plan Existing Conditions Report, the City's recycled water is produced at its Wastewater Quality Control Facility, a tertiary treatment facility. Since 2015, the City has used tertiary-treated recycled water at fill stations for dust control at construction sites. By 2020, construction water usage is expected to be about 30 acre-feet per year (City of Manteca 2017).

3.10.1.4 Floodplain

The Federal Emergency Management Agency (FEMA) has designated the entire Project site as Zone X, which indicates minimal flood hazard. The Project site is located in an area classified as 0.2 percent annual chance flood hazard, an area with reduced flood risk due to levee, and an area of minimal flood hazard. **Figure 5: Flood Zone Delineation** indicates the flood hazard zones within the Project site (FEMA 2017).

This page intentionally left blank



LSA

LEGEND

- X, 0.2 PCT ANNUAL CHANCE FLOOD HAZARD
- X, AREA OF MINIMAL FLOOD HAZARD
- X, AREA WITH REDUCED FLOOD RISK DUE TO LEVEE
- APE

N

0 300 600
FEET

FIGURE 5

Airport Way Widening Project
Manteca, California
LSA Project No. MKT1603

Flood Zone Delineation

SOURCE: DigitalGlobe Aerial Imagery (10/2017); FEM's National Flood Hazard Layer (10/2009)

I:\MKT1603\GIS\Reports\ISMND\Figure5_FloodZone.mxd (12/17/2018)

This page intentionally left blank

3.10.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. During the construction of the Project, excavation, grading, and paving would occur. Soil removed during construction would be stored and controlled to reduce soil erosion and sedimentation of downstream waterways. Pollutants and hazardous materials such as gasoline, diesel fuel, oil, solvents, and trash stored and used during Project construction would be subject to State and local regulations. Compliance with State and local regulations would reduce the potential for materials to enter drainages and degrade downstream water quality. In compliance with the NPDES, the State Water Resources Control Board requires dischargers whose projects disturb 1 or more acre of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acre, to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit 99-08-DWQ). Effective July 1, 2010, all dischargers are required to obtain coverage under the Construction General Permit Order 2009-0009-DWQ adopted on September 2, 2009. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation. The Project will be required to obtain coverage under this permit and comply with applicable regulations. Once operational, stormwater percolation basins will allow for on-site treatment and drainage to ensure compliance with water quality standards. Implementation of the project will not violate any water quality standards, waste discharge requirements, or otherwise substantially degrade surface or ground water quality. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project site is located in the San Joaquin Valley groundwater basin, Eastern San Joaquin groundwater subbasin. Water required for dust control during Project construction will be sourced from recycled water, as described above, and therefore would not affect groundwater basin levels. Construction of the Project will result in an increase of impervious surface area. The Project will include seven percolation basins for on-site stormwater treatment. Percolation basins will allow for retention and disposal of stormwater and would detain the stormwater runoff volume of a 10-year, 48-hour-duration storm within 96 hours. The basins will allow for percolation of water into the ground, thus nominally adding to groundwater recharge in the Project area. Implementation of the Project will not substantially deplete groundwater supplies, interfere substantially with groundwater recharge or impede sustainable groundwater management of the basins in the area. Impacts will be less than significant and no mitigation is required.

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

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

LESS THAN SIGNIFICANT IMPACT. The Project would result in the removal of ditches along the existing roadway and may result in minimal changes to the existing drainage pattern of the site. Seven percolation basins and a gutter would be constructed for the retention and disposal of runoff and to maintain existing drainage patterns and comply with stormwater quality requirements. In addition, the Project would not alter the course of any stream or river. The Project would not result in substantial erosion or siltation on or off site. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project would result in minor changes to existing drainage patterns as well as an increase in impervious surface area. The Project would include the construction of percolation basins to control surface runoff to maintain existing drainage patterns. Percolation basins would allow for on-site retention, treatment, and disposal of runoff. Therefore, the Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project would include the construction of seven additional percolation basins for on-site stormwater treatment. The additional basins would allow existing drainage patterns to be maintained and would ensure compliance with stormwater quality requirements. Design and construction of the percolation basins would comply with the City's Storm Drain Master Plan, with capacity to detain the stormwater runoff volume of a 10-year, 48-hour-duration storm within 96 hours. Construction contractors will be required to prepare and implement a Storm Water Pollution Protection Plan (SWPPP) and comply with conditions of the NPDES general stormwater permit for construction activity. The SWPPP will include implementation of a monitoring program and a Spill Prevention Control and Countermeasures Plan. The contractor will be required to obtain a permit from the CVRWQCB detailing a plan to control any spills that would occur during construction. The plan would describe construction activities to be conducted, Best Management Practices (BMPs) that will be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that will be conducted. With implementation of **Mitigation Measures HYDRO-1** and **HYDRO -2**, construction impacts will be less than significant.

Once operational, runoff water generated from the Project will not exceed the capacity of the basins. The Project will not result in any other adverse effects on water quality. The Project will not substantially degrade water quality. Therefore, less than significant impacts will occur.

Mitigation Measure HYDRO-1: The City of Manteca shall prepare and implement construction site temporary BMPs in compliance with the provisions of the NPDES Permit and ay subsequent permit pertaining to construction of the proposed Project. The City shall submit a Notice of Construction to the CVRWQCB at least 30 days prior to the commencement of construction and shall submit a Notice of Termination to the CVRWQCB upon completion of the proposed Project. The temporary BMPs shall be installed prior to commencement of any construction activities and shall be in place for the duration of the construction period. The removal of the BMPs shall be the final operation, along with the Project site cleanup.

Mitigation Measure HYDRO-2: A SWPPP shall be prepared by the construction contractor in accordance with typical provisions associated with a Regional General Permit for Construction Activities (on file with the CVRWQCB). The SWPPP shall contain a Spill Response Plan with instruction and procedures for reporting spills, the use and location of spill containment equipment, and the use and location of spill collection materials.

iv. impede or redirect flood flows?

NO IMPACT. The Project includes the widening of an existing two-lane roadway to a six-lane roadway and will not include the construction of additional structures. FEMA has designated the entire Project site as Zone X, which indicates minimal flood hazard. The Project site is located in an area classified as 0.2 percent annual chance flood hazard, an area with reduced flood risk due to levee, and an area of minimal flood hazard. The Project would not place structures in an area that will impede or redirect flood flows. No impact will occur and no mitigation is required.

d. Would the project be located in a flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

NO IMPACT. The Project is located in the western portion of Manteca. The area is topographically flat, and there is no body of water located within or adjacent to the Project site. The Project site is not within a seiche, tsunami, or mudflow hazard area. No impacts will occur and no mitigation is required.

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

NO IMPACT. As discussed above, the Project will comply with the applicable water quality control plan, SWPPP, and NPDES permit. The project will not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. No impact will occur and no mitigation is required.

3.11 LAND USE AND PLANNING

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

3.11.1 Environmental Setting

The Project is located along an existing roadway in Manteca. Existing land uses surrounding the Project site include single-family residential, multifamily residential, institutional, industrial, commercial, and agricultural (City of Manteca 2017). The City of Manteca General Plan 2023 Policy Document designates future land uses surrounding the Project area to include industrial and commercial uses. No known planned residential developments are within the Project area. In addition, the City's Master and Specific Plans have been reviewed to confirm there are no planned developments near the Project area. The City of Manteca Family Entertainment Zone Master Plan is planned along McKinley Avenue and SR-120 but will not border Airport Way.

The site is within the jurisdiction of an HCP, specifically the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan. The site is not within the jurisdiction of a Natural Community Conservation Plan applicable to the Project.

3.11.2 Impact Analysis

a. Would the project physically divide an established community?

NO IMPACT. The Project would widen an existing roadway within an established community, resulting in an increase in circulation capacity, and benefit connectivity within the community. The Project would not substantially change the physical arrangement of the established community or physically divide an established community. No impact will occur and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project will include the widening of Airport Way from a two-lane to a six-lane roadway. The City of Manteca General Plan 2023 Policy Document outlines the City's Major Street Master Plan, which proposes a four-lane roadway within the Project area. However, a General Plan update is currently underway (as of October 2019) and is anticipated to propose a six-lane roadway for Airport Way in order to serve build out of the Land Use Element. Once the General Plan update is complete, the Project will be consistent with the City's General Plan and Major Street Master Plan. The City's Public Facilities Implementation

Plan (PFIP) is the implementing program for public infrastructure policies identified in the City's General Plan Policy Document. Section 8, Transportation, of the PFIP proposes that Airport Way be widened to a six-lane roadway within the Project area. In addition, no Master or Specific Plan covers the Project area. Therefore, the Project will not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project. Impacts will be less than significant and no mitigation is required.

3.12 MINERAL RESOURCES

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

3.12.1 Environmental Setting

The Project is in Manteca, which is in the southern portion of San Joaquin County. Sand, gravel, and natural gas are the primary mineral resources found in the county, as well as limited amounts of peat, gold, and silver. The Project site falls within the Stockton-Lodi Production-Consumption Region and was assessed by the California Geological Survey to determine the availability of Portland cement concrete aggregate. The southern half of the Project site is not within a classified mineral resource zone identified by the City. The northern half of the Project site lies within Mineral Resource Zone (MRZ) 3. MRZ-3 is defined as areas containing mineral deposits, the significance of which cannot be evaluated from available data (City of Manteca 2017).

3.12.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. The Project site is designated MRZ-3 for Portland cement concrete aggregate, which indicates that the significance of mineral deposits cannot be determined from available data. No known mining developments are planned within the Project site. Based on the lack of mining interests in Manteca, it is reasonable to assume that no mineral resources of value exist within the Project vicinity. Therefore, the Project would not 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. Impacts will be less than significant and no mitigation is required.

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

NO IMPACT. The Project site is not on or adjacent to a locally important mineral resource recovery site delineated on a local General Plan, Specific Plan, or other land use plan. No impact will occur and mitigation is not required.

3.13 NOISE

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

3.13.1 Environmental Setting

Noise is usually defined as unwanted sound and consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect a person's ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be measured precisely with instruments. The Project analysis defines the noise environment of the Project area in terms of sound intensity and the Project's effect on adjacent sensitive land uses.

3.13.1.1 Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are (dB) measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 dB is 10 times more intense than 1 dB; 20 dB is 100 times more intense than 1 dB; and 30 dB is 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by

the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dBA for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dBA for each doubling of distance in a hard-site environment, and the sound decreases 4.5 dBA for each doubling of distance in a relatively flat environment with absorptive vegetation.

There are many ways to rate noise for various time periods. An appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day/night average noise level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noise occurring from 7:00 p.m. to 10:00 p.m. (defined as evening hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable.

Other noise rating scales that are important when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half of the time the noise level exceeds this level, and half of the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts, which refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater since this level has been found to be the lowest audible change perceptible to humans in outdoor environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dB, which is only noticeable in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Table 3-F: Definitions of Acoustical Terms and **Table 3-G: Common Sound Levels and Their Noise Sources** provide further detail regarding noise-related terms as well as common noise sources.

Table 3-F: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of noise level that denotes the ratio between two quantities proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. 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. All sound levels in this report are A-weighted unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels equaled or exceeded by a fluctuating sound level for 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Sound Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time, usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: Harris, Cyril M., *Handbook of Acoustical Measurements and Noise Control* (1991).

Table 3-G: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environment	Subjective Evaluation
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing
	0	Very Faint	

Source: Compiled by LSA Associates, Inc. (2015).

3.13.1.2 Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure (typically more than 8 hours, as defined by the Occupational Safety and Health Administration) to noise levels higher than 85 dBA. Exposure to high noise levels affects our entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions (thereby affecting blood pressure and functions of the heart and the nervous system). In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dB, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dB, the tickling sensation is replaced by the feeling of pain in the ear. This level is called the threshold of pain. A sound level of 160 to 165 dB will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

3.13.1.3 Characteristics of Groundborne Vibration

Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. As the vibration propagates from the foundation throughout the remainder of the building, the vibration of floors and walls may be perceptible from the rattling of windows or a rumbling noise. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. When assessing annoyance from groundborne noise, vibration is typically expressed as root-mean-square velocity in units of decibels of 1 micro-inch per second.

To distinguish vibration levels from noise levels, the unit is written as "VdB." Human perception to vibration starts at levels as low as 67 VdB and sometimes lower. Annoyance due to vibration in residential settings starts at approximately 70 VdB. Groundborne vibrations are almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of the building, the motion does not provoke the same adverse human reaction.

Common sources of groundborne vibration include trains and construction activities such as blasting, pile driving, and operating heavy earthmoving equipment (see **Table 3-H: Typical Vibration Source Levels for Construction Equipment**). Although **Table 3-H** gives one level for each piece of equipment, it should be noted that there is considerable variation in reported ground vibration levels from construction activities. The data provide a reasonable estimate for a wide range of soil conditions. In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. For buildings considered to be of particular historical significance or that are particularly fragile structures, the damage threshold is approximately 96 VdB; the damage threshold for other structures is 100 VdB (Harris 1998).

Table 3-H: Typical Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 Feet (in/sec)	Approximate VdB at 25 Feet
Pile Driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile Driver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)		0.008	66
Vibratory roller		0.017	75
Hoe ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment* (2006).
in/sec= inches per second
PPV = peak particle velocity

3.13.1.4 Existing Roadway Noise Levels

Motor vehicles with their distinctive noise characteristics are the most significant source of noise in Manteca. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the observer. Major contributing roadway noise sources in Manteca include SR-99, SR-120, and other arterial routes, including Yosemite Avenue and Airport Way.

Existing highway and roadway traffic noise levels in the Project vicinity were assessed using the guidelines provided in the Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD 77-108). This approach uses a typical vehicle mix for urban/suburban areas in

California and requires parameters (including traffic volumes, vehicle speed, and roadway geometry) to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the L_{dn} values. Existing traffic noise contours along modeled roadway segments are shown in **Table 3-I: Existing Traffic Noise Levels**.

Table 3-I: Existing Traffic Noise Levels

Roadway Segment	Average Daily Trips	Centerline to 70 dBA L_{dn} (feet)	Centerline to 65 dBA L_{dn} (feet)	Centerline to 60 dBA L_{dn} (feet)	L_{dn} (dBA) 50 Feet from Centerline of Outermost Lane
Airport Way north of Yosemite Avenue	13,300	< 50	74	159	66.9
Airport Way between Yosemite Avenue and Wawona Street	13,950	< 50	77	165	67.1
Airport Way between Wawona Street and Daniels Street	14,900	< 50	80	172	67.3
Airport Way south of Daniels Street	20,650	< 50	100	214	68.2
Yosemite Avenue west of Airport Way	10,100	< 50	77	162	65.9
Yosemite Avenue east of Airport Way	15,250	< 50	100	213	67.6
Wawona Way east of Airport Way	2,050	< 50	< 50	< 50	53.8
Daniels Street west of Airport Way	17,350	< 50	75	155	65.1
Daniels Street east of Airport Way	5,200	< 50	< 50	54	59.7

Source: Mark Thomas (2018); compiled by LSA (2018).
Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate roadways adjacent to the Project site.
ADT = average daily traffic
dBA = A-weighted decibels
L_{dn} = day/night average noise level

3.13.1.5 Existing Airport Noise Levels

The closest airport to the Project site is Stockton Metropolitan Airport, which is located approximately 6 miles north. In addition, New Jerusalem Airport is approximately 8 miles southwest of the Project site. Although noise from aircraft activity is occasionally audible in the Project vicinity, due to the distance of the Project site from surrounding airports, no portion of the Project site lies within the 55 dBA CNEL noise contours of any public airport.

3.13.1.6 Existing Sensitive Land Uses in the Project Area

Certain land uses are considered more sensitive to noise than others. Examples of these include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. The Project site is adjacent to existing agricultural, single-family residential, multifamily residential, institutional, industrial nonmanufacturing, and commercial land uses. The closest sensitive receptors include the single-family residences adjacent to Airport Way, approximately 50 feet from the centerline of the outermost lane.

3.13.2 Impact Analysis

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

LESS THAN SIGNIFICANT WITH MITIGATION. The City of Manteca General Plan sets standards for noise exposure from mobile noise sources in specific land uses and for stationary noise sources during daytime and nighttime hours as shown below in **Table 3-J: Maximum Allowable Noise Exposure (Mobile Noise Sources)** and **Table 3-K: Performance Standards for Stationary Noise Sources or Projects Affected by Stationary Noise Sources**.

Table 3-J: Maximum Allowable Noise Exposure (Mobile Noise Sources)

Land Use[4]	Outdoor Activity Areas[1]	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[3]
Residential	60[2]	45	
Transient Lodging	60[2]	45	
Hospitals, Nursing Homes	60[2]	45	
Theaters, Auditoriums, Music Halls			35
Churches, Music Halls	60[2]		40
Office Buildings	65		45
Schools, Libraries, Museums			45
Playgrounds, Neighborhood Parks	70		

Source: City of Manteca (2010).

Notes:

1 Outdoor activity areas for residential development are considered to be backyard patios or decks of single-family dwellings, and the common areas where people generally congregate for multifamily developments. Outdoor activity areas for nonresidential developments are considered to be those common areas where people generally congregate, including pedestrian plazas, seating areas, and outside lunch facilities. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.

2 In areas where it is not possible to reduce exterior noise levels to 60 dB L_{dn} or below using a practical application of the best noise-reduction technology, an exterior noise level of up to 65 L_{dn} will be allowed.

3 Determined for a typical worst-case hour during periods of use.

4 Where a proposed use is not specifically listed in the table, the use shall comply with the noise exposure standards for the nearest similar use as determined by the City of Manteca.

CNEL = Community Noise Equivalent Level
dB = decibel(s)
L_{dn} = day/night average noise level
L_{eq} = equivalent continuous sound level

Table 3-K: Performance Standards for Stationary Noise Sources or Projects Affected by Stationary Noise Sources

Noise Level Descriptor	Daytime	Nighttime
	7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
Hourly L_{eq}, dB	50	45
Maximum Level, dB	70	65

Source: City of Manteca (2010).
Notes:
[1] Each of the noise levels specified above should be lowered by 5 dB for simple noise tones, noises consisting primarily of speech or music, or recurring impulsive noises. Such noises are generally considered by residents to be particularly annoying and are a primary source of noise complaints.
[2] No standards have been included for interior noise levels. Standard construction practices should, with the exterior noise levels identified, result in acceptable interior noise levels.
dB = decibels
L_{eq} = equivalent continuous sound level

Residential land uses occur within the Project vicinity. Therefore, the Project would be subject to the maximum mobile noise levels listed in **Table 3-J**.

Operational Noise Impacts

Traffic Noise. The Project consists of widening Airport Way from the existing two lanes to a six-lane arterial roadway, with three travel lanes in each direction, a raised median, and a 5-foot Class II bike lane with curb and gutter and a 6-foot sidewalk on either side of street. The City is also proposing a phasing alternative for the Project. The initial phase would include widening of the existing roadway to a four-lane facility. Phase 2, construction of the ultimate six-lane facility, would be completed once funding is available. The improvement for the initial phase includes two travel lanes and a Class II bike lane in each direction with a two-way turn lane. The curb, gutter, and sidewalk are proposed on the east side of the roadway only.

To assess traffic noise impacts, the traffic noise levels along major roadway segments within the Project vicinity were projected using FHWA modeling to predict traffic noise levels under the following conditions:

- Existing Traffic Volumes Plus No Project
- Existing Traffic Volumes Plus Four-Lane Roadway Project
- Existing Traffic Volumes Plus Six-Lane Roadway Project
- Design Year (2040) Traffic Volumes Plus No Project
- Design Year (2040) Traffic Volumes Plus Four-Lane Roadway Project
- Design Year (2040) Traffic Volumes Plus Six-Lane Roadway Project

FHWA modeling was based on existing traffic conditions as described in Section 3.16 of this document. FWHA modeling results are summarized in **Table 3-L: Summary of Traffic Noise Levels**. **Table 3-L** includes projected traffic noise levels as measured at 50 feet from the centerline of the outermost traveled lane along the modeled roadway segments. The model does not account for existing sound walls or terrain features that could reduce traffic noise levels at adjacent land uses, but rather assumes a worst-case direct line-of-sight over hard surface to the modeled traffic noise sources.

Four-Lane Roadway. As shown in **Table 3-L**, under existing conditions, noise levels on Airport Way through the Project corridor range from approximately 66.9 dBA to 67.3 dBA L_{dn}, which exceeds the City's maximum allowable noise exposure for mobile noise sources of 65 dBA L_{dn} for residential land uses. Design Year (2040) traffic noise levels would range from approximately 69.7 to 70.0 dBA L_{dn} and would continue to exceed the maximum allowable noise exposure levels. However, these increased future noise levels would occur with or without implementation of the Project.

As noted above, the Project may be phased. The first phase would widen the existing roadway to a four-lane facility. When funding is available, the roadway would be further widened to the ultimate six-lane facility. The improvements for the initial phase include two travel lanes and a Class II bike lane in each direction with a two-way turn lane. Curb, gutter, and sidewalk are proposed on the east side of the roadway only.

As discussed above, the Project would not result in an increase in vehicular trips on Airport Way. Implementation of the four-lane roadway would decrease traffic noise levels by approximately 1.5 to 1.6 dBA, as traffic would be split between the two lanes and cars traveling in the inner lane would be located farther from the adjacent residences, resulting in an overall noise level decrease. Under Existing Traffic Volumes Plus Four-Lane Roadway Project conditions, noise levels would be approximately 65.3 dBA to 65.8 dBA L_{dn}. Under Design Year (2040) Traffic Volumes Plus Four-Lane Roadway Project conditions, noise levels would be approximately 68.2 dBA to 68.5 dBA L_{dn}.

However, implementation of the Project would have the potential to move the roadway approximately 11 feet closer to the existing single-family residences, from approximately 50 feet to 39 feet. Moving the roadway closer to the existing residences would increase traffic noise levels by approximately 2.2 dBA compared to existing conditions. Therefore, under Existing Plus Four-Lane Project conditions, noise levels would be approximately 67.5 dBA to 68.0 dBA L_{dn} at the closest sensitive receptors. Under Design Year (2040) Plus Four-Lane Project conditions, noise levels would be approximately 70.4 dBA to 70.7 dBA L_{dn} at the closest sensitive receptors.

This page intentionally left blank

Table 3-L: Summary of Traffic Noise Levels

Roadway Segment	Existing Traffic Volumes								Design Year (2040) Traffic Volumes							
	No Project		Plus Four-Lane Roadway Project			Plus Six-Lane Roadway Project			No Project		Plus Four-Lane Roadway Project			Plus Six-Lane Roadway Project		
	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions	ADT	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Airport Way north of Yosemite Avenue	13,300	66.9	13,300	65.3	-1.6	13,300	64.6	-2.3	25,600	69.7	25,600	68.2	-1.5	25,600	67.5	-2.2
Airport Way between Yosemite Avenue and Wawona Street	13,950	67.1	13,950	65.6	-1.5	13,950	64.8	-2.3	26,450	69.8	26,450	68.3	-1.5	26,450	67.6	-2.2
Airport Way between Wawona Street and Daniels Street	14,900	67.3	14,900	65.8	-1.5	14,900	65.1	-2.2	27,550	70.0	27,550	68.5	-1.5	27,550	67.8	-2.2
Airport Way south of Daniels Street	20,650	68.2	20,650	68.2	0.0	20,650	68.2	0.0	41,300	71.2	41,300	71.2	0.0	41,300	71.2	0.0
Yosemite Avenue west of Airport Way	10,100	65.9	10,100	65.9	0.0	10,100	65.9	0.0	14,200	67.3	14,200	67.3	0.0	14,200	67.3	0.0
Yosemite Avenue east of Airport Way	15,250	67.6	15,250	67.6	0.0	15,250	67.6	0.0	22,100	69.3	22,100	69.3	0.0	22,100	69.3	0.0
Wawona Way east of Airport Way	2,050	53.8	2,050	53.8	0.0	2,050	53.8	0.0	2,400	54.5	2,400	54.5	0.0	2,400	54.5	0.0
Daniels Street west of Airport Way	17,350	65.1	17,350	65.1	0.0	17,350	65.1	0.0	25,700	66.8	25,700	66.8	0.0	25,700	66.8	0.0
Daniels Street east of Airport Way	5,200	59.7	5,200	59.7	0.0	5,200	59.7	0.0	10,950	63.0	10,950	63.0	0.0	10,950	63.0	0.0

Source: LSA (August 2018).
Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate roadways adjacent to the Project site.
ADT = average daily traffic
dBA = A-weighted decibels
L_{dn} = day/night average noise level

This page intentionally left blank

Therefore, the Project-related noise level would result in the continuation of exceeding standards for exterior and interior noise limits in areas that are directly exposed to traffic noise. As shown in **Table 3-J**, the maximum allowable noise exposure for mobile noise sources at residential land uses is up to 65 dBA L_{dn} at outdoor activity areas and 45 dBA L_{dn} in interior spaces. The City's General Plan defines outdoor activity areas as backyard patios or decks. Therefore, as the residences front Airport Way, the residential buildings would shield noise from the backyard outdoor activity areas, resulting in a noise level decrease of approximately 10 dBA. Thus, noise levels in the backyards at the closest residences would be approximately 57.5 dBA to 58.0 dBA L_{dn} under Existing Plus Four-Lane Project conditions and approximately 60.4 dBA to 60.7 dBA L_{dn} under Design Year (2040) Plus Four-Lane Project conditions. Therefore, the Project would not result in a substantial permanent increase in ambient noise levels that would result in any outdoor activity areas exceeding standards for exterior noise limits.

In addition, as indicated above, the maximum allowable noise exposure for mobile noise sources at residential land uses is up to 45 dBA L_{dn} in interior spaces. The Project would expose the existing adjacent sensitive receptors to noise levels that range from approximately 67.5 dBA to 68.0 dBA L_{dn} under Existing Plus Four-Lane Project conditions and from 70.4 dBA to 70.7 dBA under Design Year (2040) Plus Four-Lane Project conditions. The exterior-to-interior noise level reduction with windows open would be approximately 15 dBA. Therefore, the adjacent sensitive receptors would be exposed to interior noise levels that would range from approximately 52.5 dBA to 53.0 dBA L_{dn} under Existing Plus Four-Lane Project conditions and interior noise levels that would range from approximately 55.4 dBA to 55.7 dBA L_{dn} under Design Year (2040) Plus Four-Lane Project conditions, which would be above the City's 45 dBA L_{dn} interior residential noise standard.

A summary of traffic noise levels at the closest sensitive receptors with implementation of the four-lane roadway is shown in **Table 3-M: Four-Lane Roadway Noise Impacts at Nearby Sensitive Receptors**, below.

Table 3-M: Four-Lane Roadway Noise Impacts at Nearby Sensitive Receptors

	Existing Traffic Noise Levels	Traffic Noise Levels with Four-Lane Project	Traffic Noise Levels with Decreased Setback	Traffic Noise Levels at Outdoor Activity Areas	Interior Noise Levels
Existing Traffic Volumes Plus Four-Lane Roadway Project Conditions					
Noise Level (dBA L_{dn})	66.9–67.3	65.3–65.8	67.5–68.0	57.5–58.0	52.5–53.0
Maximum Allowable Noise Exposure	–	–	–	65.0	45.0
Exceed?	–	–	–	**No**	**Yes**
Design Year (2040) Traffic Volumes Plus Four-Lane Roadway Project Conditions					
Noise Level (dBA L_{dn})	69.7–70.0	68.2–68.5	70.4–70.7	60.4–60.7	55.4–55.7
Maximum Allowable Noise Exposure	–	–	–	65.0	45.0
Exceed?	–	–	–	**No**	**Yes**

Source: LSA 2018b.
dBA = A-weighted decibels
Ldn = day/night average noise level

As discussed above and shown in **Table 3-M**, implementation of the four-lane roadway would result in interior noise levels exceeding the City's 45 dBA L_{dn} interior residential noise standard. Based on preliminary analysis, due to distance attenuation, residential buildings within 135 feet of the centerline of the outermost travel lane would have interior noise levels that would exceed 45 dBA L_{dn}. Therefore, further analysis would be required at all residential buildings within 135 feet of the centerline of the outermost travel lane to meet the City's 45 dBA L_{dn} interior residential noise standard.

To reduce traffic noise, typical noise mitigation would include the construction of a stand-alone sound wall. Building a sound wall to mitigate noise levels at the residences would not be feasible because the residences are oriented toward the roadway and a sound wall would limit access to the properties. Therefore, the City shall survey the residences along Airport Way and implement a traffic noise reduction program to retrofit homes, as described in **Mitigation Measure NOS-1,** below.

Mitigation Measure NOS-1: Prior to construction of the Project, the City shall survey the residences along Airport Way to identify which residences may need supplemental measures to reduce noise levels to meet the 45 A-weighted decibels (dBA) L_{dn} interior noise standard. For those identified residences, the City shall implement a traffic noise reduction program to retrofit homes, which could include the following measures:

- In order for windows and doors to remain closed, mechanical ventilation such as air conditioning shall be provided for all impacted units.

- Windows and exterior doors shall be upgraded with Sound Transmission Class (STC) ratings to provide sufficient exterior-to-interior noise attenuation to achieve the necessary noise reduction. All windows and glass doors rated STC 32 (or higher) shall have glass lite thickness no less than 3/16 inch.

- All windows and doors shall be installed in an acoustically effective manner. Sliding-window panels shall form an air-tight seal when in the closed position, and the window frames shall be caulked to the wall opening around the perimeter with a nonhardening caulking compound to prevent sound infiltration. Exterior doors shall seal air-tight around the full perimeter when in the closed position.

- Once the Project is constructed, interior noise monitoring shall be conducted to ensure that interior noise levels do not exceed 45 dBA L_{dn}.

Implementation of these measures would be required to reduce interior noise levels by at least 25.5 dBA with windows closed to reduce interior noise levels at residences within 135 feet of the centerline of the outermost travel lane to meet the City's 45 dBA L_{dn} interior residential noise standard.

Six-Lane Roadway. As shown in **Table 3-L**, under Existing Conditions, noise levels on Airport Way through the Project corridor range from approximately 66.9 dBA to 67.3 dBA L_{dn}, which exceeds the City's maximum allowable noise exposure for mobile noise sources of 60 dBA L_{dn} for residential land uses. Design Year (2040) traffic noise levels would range from approximately 69.7 to 70.0 dBA L_{dn} and would continue to exceed the maximum allowable noise exposure levels. However, these increased future noise levels would occur with or without implementation of the Project.

As discussed above, the Project would not result in an increase in vehicular trips on Airport Way. Implementation of the six-lane roadway would decrease traffic noise levels by approximately 2.2 to 2.3 dBA, as traffic would be split between the three lanes and cars traveling in the inner lanes would be located farther from the adjacent residences, resulting in an overall noise level decrease. Under Existing Plus Six-Lane Project conditions, noise levels would be approximately 64.6 dBA to 65.1 dBA L_{dn}. Under Design Year (2040) Plus Six-Lane Project conditions, noise levels would be approximately 67.5 dBA to 67.8 dBA L_{dn}.

However, implementation of the Project would have the potential to move the roadway approximately 21 feet closer to the existing single-family residences (from approximately 50 feet to 29 feet). Moving the roadway closer to the existing residences would increase traffic noise levels by approximately 4.7 dBA compared to existing conditions. Therefore, under Existing Plus Six-Lane Project conditions, noise levels would be approximately 69.3 dBA to 69.8 dBA L_{dn} at the closest

sensitive receptor. Under Design Year (2040) Plus Six-Lane Project conditions, noise levels would be approximately 72.2 dBA to 72.5 dBA L_{dn} at the closest sensitive receptor.

The Project-related noise level would result in the continuation of exceeding standards for exterior and interior noise limits in areas that are directly exposed to traffic noise. As shown in **Table 3-J**, the maximum allowable noise exposure for mobile noise sources at residential land uses is up to 65 dBA L_{dn} at outdoor activity areas and 45 dBA L_{dn} in interior spaces. The City's General Plan defines outdoor activity areas as backyard patios or decks. Therefore, as the residences front Airport Way, the residential buildings would shield noise from the backyard outdoor activity areas, resulting in a noise level decrease of approximately 10 dBA. Therefore, noise levels in the backyards at the closest residences would be approximately 59.3 dBA to 59.8 dBA L_{dn} under Existing Plus Six-Lane Project conditions and approximately 62.2 dBA to 62.5 dBA L_{dn} under Design Year (2040) Plus Six-Lane Project conditions. The Project would not result in a substantial permanent increase in ambient noise levels that would cause any outdoor activity areas to exceed standards for exterior noise limits.

In addition, as indicated above, the maximum allowable noise exposure for mobile noise sources at residential land uses is up to 45 dBA L_{dn} in interior spaces. The Project would expose the existing adjacent sensitive receptors to noise levels that range from approximately 69.3 dBA to 69.8 dBA L_{dn} under Existing Plus Six-Lane Project conditions and range from 72.2 dBA to 72.5 dBA under Design Year (2040) Plus Six-Lane Project conditions. Exterior-to-interior noise level reduction with windows open would be approximately 15 dBA. Therefore, the adjacent sensitive receptors would be exposed to interior noise levels that would range from approximately 54.3 dBA to 54.8 dBA L_{dn} under Existing Plus Six-Lane Project conditions and interior noise levels that would range from approximately 57.2 dBA to 57.5 dBA L_{dn} under Future Plus Six-Lane conditions, which would be above the City's 45 dBA L_{dn} interior residential noise standard.

A summary of traffic noise levels at the closest sensitive receptors with implementation of the six-lane roadway is shown in **Table 3-N: Six-Lane Roadway Noise Impacts at Nearby Sensitive Receptors**, below.

Table 3-N: Six-Lane Roadway Noise Impacts at Nearby Sensitive Receptors

	Existing Traffic Noise Levels	Traffic Noise Levels with Six-Lane Project	Traffic Noise Levels with Decreased Setback	Traffic Noise Levels at Outdoor Activity Areas	Interior Noise Levels
Existing Plus Six-Lane Project Conditions					
Noise Level (dBA L_{dn})	66.9–67.3	64.6–65.1	69.3–69.8	59.3–59.8	54.3–54.8
Maximum Allowable Noise Exposure	–	–	–	65.0	45.0
Exceed?	–	–	–	**No**	**Yes**
Future Plus Six-Lane Project Conditions					
Noise Level (dBA L_{dn})	69.7–70.0	67.5–67.8	72.2–72.5	62.2–62.5	57.2–57.5
Maximum Allowable Noise Exposure	–	–	–	65.0	45.0
Exceed?	–	–	–	**No**	**Yes**

Source: LSA (October 2018).
dBA = A-weighted decibels
L_{dn} = day/night average noise level

As discussed above and shown in **Table 3-N**, implementation of the six-lane roadway would result in interior noise levels that would exceed the City's 45 dBA L_{dn} interior residential noise standard. Based on preliminary analysis, due to distance attenuation, residential buildings within 165 feet of the centerline of the outermost travel lane would have interior noise levels that would exceed 45 dBA L_{dn}. Therefore, further analysis would be required at all residential buildings within 165 feet of the centerline of the outermost travel lane to meet the City's 45 dBA L_{dn} interior residential noise standard.

To reduce traffic noise, typical noise mitigation would include the construction of a stand-alone sound wall. Building a sound wall to mitigate noise levels at the residences would not be feasible because the residences are oriented toward the roadway and a sound wall would limit access to the properties. Therefore, the City shall survey the residences along Airport Way and implement a traffic noise reduction program to retrofit homes, as described in **Mitigation Measure NOS-2,** below.

Mitigation Measure NOS-2: Prior to construction of the Project, the City shall survey the residences along Airport Way to identify which residences may need supplemental measures to reduce noise levels to meet the 45 dBA L_{dn} interior noise standard. For the residences identified, the City shall implement a traffic noise reduction program to retrofit homes, which could include the following measures:

- In order for windows and doors to remain closed, mechanical ventilation such as air conditioning shall be provided for all impacted units.
- Windows and exterior doors shall be upgraded with STC ratings to provide sufficient exterior-to-interior noise attenuation to achieve the necessary noise reduction. All

windows and glass doors rated STC 32 (or higher) shall have glass lite thickness no less than 3/16 inch.

- All windows and doors shall be installed in an acoustically effective manner. Sliding-window panels shall form an air-tight seal when in the closed position, and the window frames shall be caulked to the wall opening around the perimeter with a nonhardening caulking compound to prevent sound infiltration. Exterior doors shall seal air-tight around the full perimeter when in the closed position.

- Once the Project is constructed, interior noise monitoring shall be conducted to ensure that interior noise levels do not exceed 45 dBA L_{dn}.

Implementation of these measures would be required to reduce interior noise levels by at least 27.5 dBA with windows closed to reduce interior noise levels at residences within 165 feet of the centerline of the outermost travel lane to meet the City's 45 dBA L_{dn} interior residential noise standard.

With implementation of **Mitigation Measure NOS-1** and **NOS-2**, the Project would result in a less than significant impact during operation.

Construction Noise Impacts

The Project site is adjacent to agricultural, single-family residential, multifamily residential, institutional, industrial nonmanufacturing, and commercial land uses. The closest sensitive receptor along Airport Way is approximately 50 feet from the centerline of the outermost lane. This residence would be as close as 10 feet from where construction would be occurring, as the Project would also include improvements such as new bike lanes and sidewalks. Project construction would result in short-term noise impacts on these adjacent land uses. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days, depending on the phase of construction. The entire construction duration is expected to be approximately 5 to 6 months. The level and types of noise impacts that would occur during construction are described below.

Construction is performed in multiple phases, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and therefore would change the noise levels as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. **Table 3-O: Typical Construction Equipment Maximum Noise Levels, L_{max}** lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise

receptor obtained from the FHWA Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the Project area but would no longer occur once Project construction is completed.

Two types of short-term noise impacts could occur during construction of the Project. The first type involves construction crew commutes and the transport of construction equipment and materials to the site, which would incrementally increase noise levels on roads leading to the Project site. As shown in **Table 3-O**, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during excavation, grading, and construction on the Project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels would vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table 3-O lists maximum noise levels recommended for noise impact assessments for typical construction equipment, based on a distance of 50 feet between the equipment and a noise receptor. Typical maximum noise levels range up to 88 dBA L_{max} at 50 feet during the noisiest construction phase, assuming a crane, forklift, tractor, welder, and backhoe would be operating simultaneously. The site preparation phase, including excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Table 3-O: Typical Construction Equipment Maximum Noise Levels, L_{max}

Equipment Description	Acoustical Usage Factor (percent)	Maximum Noise Level (L_{max}) at 50 Feet[1]
Backhoes	40	80
Compactor (ground)	20	80
Compressor	40	80
Cranes	16	85
Dozers	40	85
Dump Trucks	40	84
Excavators	40	85
Flat-Bed Trucks	40	84
Forklift	20	85
Front-end Loaders	40	80
Graders	40	85
Impact Pile Drivers	20	95
Jackhammers	20	85
Pickup Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Rock Drills	20	85
Rollers	20	85
Scrapers	40	85
Tractors	40	84
Welder	40	73

Source: Federal Highway Administration, Roadway Construction Noise Model (2006).
Note: Noise levels reported in this table are rounded to the nearest whole number.
[1] Maximum noise levels were developed based on Spec 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" Project.
L_{max} = maximum instantaneous noise level

The site preparation phase, including excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

As discussed above, the closest sensitive receptor along Airport Way is approximately 50 feet from the centerline of the outermost lane. This residence would be as close as 10 feet from where construction would be occurring, as the Project would also include improvements such as new bike lanes and sidewalks. At 10 feet, there would be an increase of approximately 14 dBA from the reduced distance compared to the noise level measured at 50 feet from the active construction area. Therefore, the closest receptor may be subject to short-term construction noise reaching 102 dBA L_{max} when construction is occurring at the Project site boundary. However, due to the linear nature of the Project, construction activities at any one receptor location would occur for a limited duration.

Chapter 9.52 Residential Noise of the City's Municipal Code provides an exemption for public health and safety activities including construction operations at any time on public rights-of-way, public

property and those situations that may occur on private property deemed necessary to serve the best interest of the public and to protect the public's health and well-being. Such activities, including Project construction are not subject to the City's residential noise standards. In addition, construction noise is permitted by the City when activities occur between 7:00 a.m. and 8:00 p.m.

Construction noise would result in a temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project. However, such increases would remain in compliance with City standards. Implementation of **Mitigation Measures NOS-3, NOS-4, NOS-5, NOS-6,** and **NOS-7** would reduce potential construction-period noise impacts for the indicated sensitive receptors to less than significant levels.

Mitigation Measure NOS-3: Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.

Mitigation Measure NOS-4: Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active Project site.

Mitigation Measure NOS-5: Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active Project site during all Project construction.

Mitigation Measure NOS-6: Ensure that all general construction-related activities are restricted to between the hours of 7:00 a.m. and 8:00 p.m.

Mitigation Measure NOS-7: Designate a "disturbance coordinator" at the City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.

With implementation of **Mitigation Measures NOS-3** through **NOS-7**, the Project would result in a less than significant impact during construction.

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

LESS THAN SIGNIFICANT IMPACT. Common sources of groundborne vibration and noise include trains and construction activities such as blasting, pile driving, and operating heavy earthmoving equipment. No permanent noise sources that would expose persons to excessive groundborne vibration or noise levels would be located at the Project site. The Project would not require the use of pile-driving equipment during construction, and operation activities associated with the Project would not result in excessive groundborne vibration or groundborne noise levels. The proposed

Project, during construction and operation, would not generate excessive groundborne vibration or groundborne noise levels. Impacts will be less than significant and no mitigation is required.

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

NO IMPACT. The closest airport to the Project site is Stockton Metropolitan Airport, which is located approximately 6 miles north. In addition, New Jerusalem Airport is approximately 8 miles southwest of the Project site. Aircraft noise is occasionally audible within Manteca due to the distance to surrounding airports, but no portion of the City lies within the 55 dBA CNEL noise contours of any public airport, nor does any portion of the Project site lie within 2 miles of any private airfield or heliport. Therefore, the Project would not result in the exposure of sensitive receptors to excessive noise levels from aircraft noise sources. No impact will occur and no mitigation is required.

3.14 POPULATION AND HOUSING

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

3.14.1 Environmental Setting

The Project site is in western Manteca, California. Proximate land uses include agricultural, residential, commercial, institutional, and industrial uses. The Project includes Census Tracts 51.14 and 51.22. The populations of each census tract are included in **Table 3-P: Project Area Population**, below.

Table 3-P: Project Area Population

Census Tract	Population	Population in Housing Units	Population in Owner Occupied Units	Population in Renter Occupied Units
Census Tract 51.14	7,721	7,721	5,871	1,850
Census Tract 51.22	4,829	4,821	3,341	1,480
Total	**12,550**	**12,542**	**9,212**	**3,330**

Source: U.S. Census Bureau, *Profile of General Population and Housing Characteristics: 2010* (2010).

The Project would result in the removal of eight structures along Airport Way. Details regarding the structures are included in **Table 3-Q: Structure Removal**, below.

Table 3-Q: Structure Removal

Parcel Number	Land Use	Property Address	Size of Structure (sf)	Estimated Property Value
24130018	Single Family Residential	223 South Airport Way	1,015	$217,022
24130020	Single Family Residential	255 South Airport Way	1,584	$175,835
24130036	Single Family Residential	273 South Airport Way	912	$121,066
22202010	Single Family Residential	264 South Airport Way	672	$165,530
22202016	Single Family Residential	422 South Airport Way	820	$230,000

Table 3-Q: Structure Removal

Parcel Number	Land Use	Property Address	Size of Structure (sf)	Estimated Property Value
22210010	Single Family Residential	950 South Airport Way	1,310	$150,173
24131061	Single Family Residential	1083 South Airport Way	1,178	$97,494
22210001	Vacant	580 South Airport Way	–	$940,000

Source: San Joaquin County Assessor (2018).
sf = square feet

3.14.2 Impact Analysis

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

NO IMPACT. The Project includes the widening of an existing roadway; it does not include any new homes and businesses or any extension of roads or other infrastructure. The City of Manteca General Plan designates land uses within the area surrounding the Project as General Commercial (GC), Commercial Mixed Use (CMU), and Light Industrial (LI). Minimal housing may be developed within the commercial mixed-use districts; however, no substantial increase in housing is planned within the surrounding area. Furthermore, the Project does not propose the development of new homes and businesses. The Project is being developed to alleviate traffic concerns along Airport Way due to planned development that will occur based on the City of Manteca General Plan Land Use Plan. The proposed Project will not induce unplanned substantial population growth in the area. No impact will occur and mitigation is not required.

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

LESS THAN SIGNIFICANT IMPACT. The Project will result in the removal of eight existing structures along Airport Way. In addition, several other parcels along the roadway will be slightly reduced in size due to City right-of-way acquisition. Review of Manteca's housing market indicates comparable housing is available. In addition, the Project would be subject to the California Government Code, Sections 7260–7277, and would provide relocation assistance to residents, as appropriate. The Project will result in less than significant impacts and no mitigation is required.

3.15 PUBLIC SERVICES

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

3.15.1 Environmental Setting

The Project site is primarily surrounded by single-family residential uses, along with some multifamily residential, agricultural, commercial, institutional, and industrial uses, and is served by the public services described below.

3.15.1.1 Fire Protection

The Manteca Fire Department provides fire service and emergency medical response for the City of Manteca and the Project site. The Manteca Fire Department contains four engines, four reserve engines, one ladder truck, one medium rescue unit, one Urban Search and Rescue trailer, eight staff vehicles, two pickup trucks, and a public education trailer. The closest station to the Project site is Station 242, located approximately 1.5 miles east of the Project site at 1154 South Union Road, Manteca, California 95337 (City of Manteca 2017).

3.15.1.2 Law Enforcement

The Manteca Police Department provides law enforcement and police protection services to the City of Manteca and the Project site. The Manteca Police Department's headquarters are approximately 1.2 miles east of the Project site, at 1001 West Center Street, Manteca, California 95337. The Manteca Police Department has 63 sworn officers (City of Manteca 2017).

3.15.1.3 Schools

Manteca Unified School District provides educational services to the City of Manteca. Throughout the city, 13 schools serve grades K–8, 1 school serves grades K–6, 4 high schools serve grades 9–12, 1 school serves grades 7–12, and 1 vocational high school serves grades 11 and 12. The schools nearest to the Project site are Brock Elliot Elementary School and Sierra High School. Brock Elliot Elementary School is approximately 0.63 mile away at 1110 Stonum Lane, Manteca, California

95337, and Sierra High School is approximately 0.14 mile away at 1700 Thomas Street, Manteca, California 95337 (City of Manteca 2017).

3.15.1.4 Parks

The City of Manteca has 49 neighborhood parks, 6 community parks, and 10 special-use parks. The City maintains about 5.18 acres of parkland per 1,000 residents. Several parks are located approximately 0.5 mile from the Project site, including Roberts Estates Park, Big League Dreams Park, and the Gonsalves/Cambridge Greenbelt (City of Manteca 2017).

3.15.2 Impact Analysis

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

i. Fire protection?
ii. Police protection?
iii. Schools?
iv. Parks?
v. Other public facilities?

LESS THAN SIGNIFICANT IMPACT. The Project will include the expansion of an existing roadway from two lanes to six lanes. The Project will not increase demand for public services, nor will it degrade the quality of existing public services. Temporary lane closures and/or detours may be required during construction. However, the construction contractor will coordinate with emergency service providers to ensure that construction activities will not impair emergency response times. During operation, the Project will improve existing conditions and services by improving circulation on Airport Way and increasing access for law enforcement, fire department and emergency service vehicles. Implementation of the Project will not result in a substantial adverse physical impact associated with the provision of new or physically altered government facilities. Impacts will be less than significant and no mitigation is required.

3.16 RECREATION

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

3.16.1 Environmental Setting

The City of Manteca Parks and Recreation Department services 65 community, neighborhood, and special use parks totaling 382 acres of parkland. The Project site is located within 0.5 mile of Big League Dreams Park, Roberts Estates Park, and the Gonsalves/Cambridge Greenbelt. Big League Dreams Park includes picnic tables, play equipment, six lighted ball fields, and an indoor soccer field. Roberts Estates Park includes picnic tables, barbecues, play equipment, and a tot lot (City of Manteca 2017).

3.16.2 Impact Analysis

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

NO IMPACT. The Project includes the widening of an existing roadway to increase circulation capacity; however, the Project will not result in an increase in population. Therefore, the Project will not increase the use of recreational facilities such that substantial physical deterioration of the facility occurs or is accelerated. No impact will occur and no mitigation is required.

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

NO IMPACT. The Project will not include any recreational facilities and will not require the construction or expansion of recreational facilities. No impact will occur and no mitigation is required.

3.17 TRANSPORTATION/TRAFFIC

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project:				
a. Conflict with a program, 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?	☐	☐	☒	☐

3.17.1 Environmental Setting

3.17.1.1 Existing Local Circulation System

The Project includes the widening of Airport Way, an existing roadway in the western portion of Manteca. The Project site begins north of the Airport Way/Yosemite Avenue intersection and ends just north of Daniels Street prior to the SR-120 connection. A description of the existing roadways within the Project vicinity is presented below.

Airport Way. Airport Way is a north-south arterial that serves vehicle, transit, and goods movement. The roadway- is considered a key connection from SR-120 into Manteca and to future development. The existing roadway extends from Stockton in the north to the southern portion of San Joaquin County. In Manteca, the roadway provides two lanes of traffic (one lane in each direction). Traffic signals and turn lanes are provided at both the Yosemite Avenue intersection and the Daniels Street intersection. A side-street stop control is located at the Wawona Street intersection. The posted speed limit within the Project vicinity is 40 mph. Existing agricultural, residential, institutional, industrial, and commercial land uses are located along the roadway.

Yosemite Avenue. Yosemite Avenue is an east-west arterial that extends from the western edge of Manteca to the east, where it merges with SR-120 at the SR-99 interchange. At the Project site, the roadway provides four lanes of traffic (two lanes in each direction). A traffic signal and turn lanes are provided at the Airport Way intersection. The posted speed limit within the Project vicinity is 45 mph.

Wawona Street. Wawona Street is an east-west collector extending from Airport Way to Main Street. The two-lane roadway provides access to residential and institutional land uses. The Airport Way intersection is controlled by a side-street stop sign. The posted speed limit is 25 mph.

Daniels Street. Daniels Street is an east-west collector extending from Big League Dreams Park to Union Road. To the west of Airport Way, the roadway provides four lanes of traffic, turn lanes, and a center median. To the east of Airport Way, the roadway provides two lanes of traffic and turn lanes.

The intersection at Airport Way is controlled by a traffic signal. The posted speed limit is 30 mph east of Airport Way and 35 mph west of Airport Way.

The existing local circulation system does not provide sidewalks along the majority of Airport Way in the Project area. Sidewalks are provided along the Airport Way/Daniels Street intersection. No bicycle paths are provided within the Project area. Manteca Transit provides service from Yosemite Way to Big League Dreams Park. The Lathrop/Manteca ACE Station is approximately 0.6 mile west of the Project site along Yosemite Way. No transit station facilities are located within the Project site.

3.17.1.2 Regulatory Setting

Traffic operations are described using the qualitative term "level of service," or LOS. LOS is presented on a scale from A to F, with LOS A representing free-flow traffic conditions and LOS F representing severely congested conditions. LOS is a qualitative measure of a number of factors, including traffic volume, street and intersection design, signal timing, and other variables. High vehicular LOS tend to result in larger streets and intersections and higher speeds. As such, LOS for bicycle and pedestrian modes declines as bicyclists and pedestrians experience longer wait times to cross streets, reduced safety, and less comfort.

The City of Manteca General Plan 2023 includes several policies regarding circulation and transportation in Manteca. Policies relevant to the Project are listed below.

C-P-1: The City shall strive to balance levels of service (LOS) for all modes (vehicle, transit, bicycle, and pedestrian) to maintain a high level of access and mobility, while developing a complete and efficient circulation system. The impact of new development and land use proposals on LOS and accessibility for all modes should be considered in the review process.

C-P-2: To the extent feasible, the City shall strive for a vehicular LOS of D or better at all streets and intersections, except in the Downtown area where right-of-way is limited, pedestrian, bicycle, and transit mobility are most important and vehicular LOS is not a consideration. While vehicular LOS is not a consideration in the Downtown area, traffic studies shall disclose whether any proposed transportation or land use action will substantially increase traffic at intersections and roadways within this area of the City.

C-P-3: At the discretion of City staff, certain locations may be allowed to fall below the City's LOS standard under the following circumstances:

a. Where constructing facilities with enough capacity to provide LOS D is found to be unreasonably expensive. This applies to facilities, for example, on which it would cost significantly more per dwelling unit equivalent (DUE) to provide LOS D than is deemed reasonable by City staff.

b. Where it is difficult or impossible to maintain LOS D because surrounding facilities in other jurisdictions operate at LOS E or worse.

c. Where maintaining LOS D will be a disincentive to use of existing alternative modes or to the implementation of new transportation modes that would reduce vehicle

travel. Examples include roadway or intersection widening in areas with substantial pedestrian activity or near major transit centers.

d. In the Downtown area the City cannot maintain the vehicular LOS D standard because of the historic nature of development and limited street right-of-way. However, it is the City's goal to maintain high quality access and mobility in the area with a priority toward non-auto modes. Therefore, the City shall require that new discretionary land use action within the Downtown area, which generate net new PM peak hour auto trips, to participate in enhancing access and mobility for transit, bicycle, and pedestrian modes. These enhancements may include, but are not limited to:

    i. Enhancing sidewalks to create a high quality pedestrian environment, including wider sidewalks and improved crosswalks, landscaping, buffers between sidewalks and vehicle travel lanes, enhanced pedestrian lighting, increased availability of benches, provisions for café-style seating, and usage of monument elements and other public art. Improving bicycle facilities to include attractive and secure bicycle parking, installation of bike lockers in appropriate locations, and provision of bicycle lanes along appropriate roadways.

    ii. Enhancing transit stops through high quality, well-maintained shelters, and provision of wayfinding signage and transit timetables.

    iii. Providing off-street parking with high quality access to Downtown businesses, which is well maintained and provides amenities like shade streets, canopies, adequate lighting, and wayfinding signage.

    iv. Supporting the development of a Downtown Business Improvement District or similar mechanism to help fund ongoing maintenance of the streetscape enhancements.

    The Public Works Department shall maintain a list of all City intersections and roadway facilities that are exempt from the LOS D standard. This list shall note any alternate LOS standard that is applicable at the exempted locations.

C-P-4: Streets shall be dedicated, widened, extended, and constructed according to street cross-section diagrams established in the City Standard Plans.

C-P-13: The City shall promote development of a future roadway system as shown in the Major Streets Master Plan.

C-P-32: The City shall strive to provide on-street Class II bike lanes along major collector and arterial streets whenever feasible.

C-P-35: Improve safety conditions, efficiency, and comfort for bicyclists and pedestrians by providing shade trees and controlling traffic speeds by implementing narrow lanes on appropriate streets.

C-P-36: City shall strive to provide a sidewalk system that serves all members of the community and meets the latest guidelines related to the Americans with Disabilities Act (ADA).

C-P-37: All new sidewalks, walkways, and intersection crosswalks shall be consistent with the requirements of the ADA.

The Major Street Master Plan, included within the City's General Plan, indicates widening of Airport Way to a four-lane roadway within the Project area. In addition, the Project site is not within the Downtown Manteca area. Therefore, a standard of LOS D applies to the Project site, as described above.

3.17.1.3 Traffic Analysis

Intersection Levels of Service. Intersections within the Project vicinity were analyzed using procedures consistent with the *Highway Capacity Manual* (Transportation Research Board 2010). **Table 3-R: Intersection LOS Threshold** presents the *Highway Capacity Manual*'s delay thresholds for unsignalized and signalized intersections used to evaluate LOS for the study intersections.

Table 3-R: Intersection Level of Service Threshold

LOS	Average Delay[1]	
	Signalized	Unsignalized/Roundabout
A	< 10	< 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

Source: Transportation Research Board, *Highway Capacity Manual*, 5th Edition (2010).
[1] Measured in seconds per vehicle
LOS = level of service

Synchro/SimTraffic 9.0 microsimulation traffic analysis software was used to evaluate the following intersections within the Project vicinity:

1. Airport Way/Yosemite Avenue—Signalized
2. Airport Way/Wawona Street—Unsignalized
3. Airport Way/Daniels Street—Signalized

Morning (7:00–9:00 a.m.) and evening (4:00–6:00 p.m.) peak-period traffic counts were collected by Fehr & Peers at the study intersections on May 24, 2018. Observed LOS and average delay for the above-listed study sections under existing conditions are presented in **Table 3-S: Existing**

Intersection Levels of Service and Delay. Under existing conditions, all intersections operate at LOS D or better. Existing traffic counts are provided in **Appendix C: Trip Generation and Traffic Counts**.

Table 3-S: Existing Intersection Levels of Service and Delay

Intersection	Traffic Control	Peak Hour	LOS	Average Delay (seconds)
1. Airport Way/Yosemite Avenue	Signal	AM	C	25.4
		PM	D	45.8
2. Airport Way/Wawona Street	Side-Street Stop	AM	B	13.4 (WB)
		PM	C	17.7 (WB)
3. Airport Way/Daniels Street	Signal	AM	C	22.7
		PM	D	35.5

Source: Fehr & Peers (2018).
Notes: For intersections controlled by a traffic signal, the overall intersection LOS and delay are presented. For side-street stop intersections, the overall intersection delay is presented, with the worst side-street movement LOS and delay in parenthesis. Delay is in seconds.
LOS = level of service WB = westbound

3.17.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. The Project would result in the widening of Airport Way from a two-lane arterial to a six-lane arterial. The City of Manteca General Plan 2023 Policy Document outlines the Manteca Major Street Master Plan, which proposes the widening of Airport Way to a four-lane roadway. However, a General Plan Update is currently underway and is expected to be approved by the end of 2019 (City of Manteca n.d.). In order to serve the growing region, the updated General Plan will propose a six-lane roadway within the Project boundaries. As such, the Project will be consistent with the City's General Plan. The City's PFIP is the implementing program for public infrastructure policies identified in the City's General Plan Policy Document. Section 8, Transportation, of the PFIP proposes a six-lane roadway at the Project site. In addition, the Project will include the construction of sidewalks and bike lanes. These pedestrian and bicycle facilities will be consistent with the City's General Plan and Bicycle Master Plan.

The Project will include the expansion of bicycle and pedestrian facilities along Airport Way. Such improvements will be constructed in compliance with General Plan policies regarding bikeways, pedestrian facilities, and public transportation. The Manteca Bicycle Master Plan (City of Manteca 2003b) proposes Class II bike lanes along Airport Way. The Project includes construction of 5-foot-wide Class II bike lanes consistent with the policy document. In addition, 6-foot-wide pedestrian sidewalks will be constructed along both sides of Airport Way. Pedestrian facilities will be consistent with the requirements of the ADA. The Project will not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. Impacts will be less than significant and no mitigation measures are required.

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

LESS THAN SIGNIFICANT IMPACT. State *CEQA Guidelines* Section 15064.3, subdivision (b) states that for transportation projects, transportation impacts are to be measured by evaluating the project's VMT, as outlined in the following:

> *Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have the discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.*

Since the City of Manteca does not provide defined thresholds for VMT (and has until June 1, 2020 to do so), the Project cannot be analyzed or provide significant conclusions drawn on the basis of impacts on VMT. Since the City has until June 1, 2020 to define thresholds for analyzing a project based on VMT, the proposed Project was analyzed based on its impacts to Level of Service (LOS).

The City of Manteca's General Plan 2023 Policy Document, identifies the LOS standard within the Project area as LOS D or better. As indicated in **Table 3-T: Design Year (2040) Intersection Levels of Service and Delay**, implementation of the Project will improve LOS at each of the three main intersections within the Project area. The Airport Way/Daniels Street intersection will operate at LOS D or better under future plus Project conditions and will therefore meet the City's LOS standard. However, the Airport Way/Yosemite Avenue and Airport Way/Wawona Street intersections will not meet the City's LOS standard under future plus Project conditions.

Table 3-T: Design Year (2040) Intersection Levels of Service and Delay

Intersection	Traffic Control	Peak Hour	With Project (6 Lanes)		No Project	
			LOS	Average Delay (seconds)	LOS	Average Delay (seconds)
1. Airport Way/Yosemite Avenue	Signal	AM	D	50.6	E	76.4
		PM	E	76.1	F	163.2
2. Airport Way/Wawona Street	Side-Street Stop	AM	D	34.5 (WB LT)	F	65.4 (WB LT)
		PM	E	37.9 (WB LT)	F	60.0 (WB LT)
3. Airport Way/Daniels Street	Signal	AM	C	32.5	D	43.0
		PM	D	54.6	E	67.3

Source: Fehr & Peers (2018).
Notes: For intersections controlled by a traffic signal, the overall intersection LOS and delay are presented. For side-street stop intersections, the overall intersection delay is presented, with the worst side-street movement LOS and delay in parenthesis. Delay is in seconds.
LOS = level of service
LT = Left Turn
WB = westbound

The Project will only include improvements to north-south travel along Airport Way; it will not result in any improvements to east-west travel along Yosemite Avenue. Under existing conditions, four travel lanes are provided along Yosemite Avenue at the Airport Way intersection. Such facilities will be insufficient in the future and will not meet the City's standard of LOS D or better during p.m. peak-hour conditions. The City's PFIP identifies improvements to the Airport Way/Yosemite Avenue intersection, including modifications to the existing traffic signal. Implementation of the improvements outlined in the PFIP will improve LOS within the Project vicinity over the No Build condition.

The Project will not include any improvements to east-west travel along Wawona Street. Under current conditions, Wawona Street consists of two travel lanes (one in each direction) and a side-street stop at the Airport Way intersection. As displayed in **Table 3-T**, delays resulting in a LOS of D or below will occur for westbound travelers completing left-turn movements. North-south travel will not experience significant delay at the intersection. Improvements, specifically those related to left-turn movements, will be required along Wawona Street to meet LOS standards under future conditions. The City's PFIP identifies necessary improvements, such as a new traffic signal, to improve LOS at the intersection.

It should be noted that future conditions without implementation of the Project will result in LOS F at the Airport Way/Yosemite Avenue intersection during the p.m. peak hour and during both the a.m. and p.m. peak hours at the Airport Way/Wawona Street intersection. Although the Project will not meet the City's LOS standard, it will result in improved LOS over the No Build condition. In addition, improvement projects for the Airport Way/Yosemite Avenue intersection and the Airport Way/Wawona Street intersection have been identified within the PFIP. It is anticipated that such improvements will be implemented prior to 2040. As such, the Project will not conflict with an applicable congestion management program. Therefore, the Project will result in less than significant impacts and no mitigation is required.

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

NO IMPACT. The Project includes the widening of an existing roadway. The Project will include safety improvements such as a center median and turn lanes. The Project will not include any design features such as sharp curves or dangerous intersections, or any incompatible uses that will increase hazards along the roadway above existing conditions. As such, the Project will result in no impact and mitigation is not required.

d. Would the project result in inadequate emergency access?

LESS THAN SIGNIFICANT IMPACT. During construction, the Project may require temporary lane closures and/or detours. However, if such disruptions occur, the construction contractor will coordinate with emergency service providers to ensure that construction activities will not impair emergency response times. Once operational, the Project will result in additional travel lanes and safety features that will benefit emergency access. Impacts will be less than significant and mitigation is not required.

3.18 TRIBAL CULTURAL RESOURCES

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

3.18.1 Environmental Setting

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

a. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are included or determined to be eligible for inclusion in the CRHR.

b. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are included in a local register of historical resources, as defined in Subdivision (k) of PRC §5020.1.

c. A resource determined by the Lead Agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Subdivision (c) of PRC §5024.1. In applying the criteria set forth in Subdivision (c) of PRC §5024.1 for the purposes of this paragraph, the Lead Agency shall consider the significance of the resource to a California Native American tribe.

The new procedures under AB 52 offer the tribes an opportunity to take an active role in the CEQA process in order to protect tribal cultural resources.

On July 10, 2018, LSA emailed a letter describing the Project and a map depicting a 0.5-mile study area around the Project site to the NAHC in Sacramento, requesting a review of its Sacred Lands File for the presence of any Native American cultural resources that might be affected by the proposed Project. The NAHC is the official State repository of Native American sacred site location records in California. On July 27, the NAHC responded via email with negative results and stated in a letter dated July 26, 2018, that "the absence of specific site information in the Sacred Lands File does not indicate the absence of Native American cultural resources in any [project site]." Additionally, the NAHC provided a list of Native American tribes it recommends contacting for more information about the Project site. LSA did not contact any geographically affiliated tribal groups to inquire about tribal resources within the Project site. Prior to release of a Negative Declaration, MND, or Environmental Impact Report for a project, the City must provide traditionally and culturally affiliated tribal groups the opportunity to consult under AB 52 if they have requested, in writing, notice from the Lead Agency of any proposed projects in the area.

3.18.2 Impact Analysis

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

i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)? Or

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

LESS THAN SIGNIFICANT WITH MITIGATION. As described above, research was conducted to determine if sensitive historical or Native American sites were located within the Project vicinity. No tribal cultural resources were identified within or adjacent to the Project area that are listed or eligible for listing in the CRHR or a local register of historical resources, as defined in PRC Section 5020.1(k), or that have been determined by the City to be significant pursuant to PRC Section 5024.1.

Implementation of **Mitigation Measures CULT-1** and **CULT-3**, presented in Section 3.5, Cultural Resources, would reduce any potentially significant impacts from the Project to tribal cultural resources (including human remains, which may be inadvertently discovered during construction activities) to a less than significant level.

3.19 UTILITIES AND SERVICE SYSTEMS

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

3.19.1 Environmental Setting

The Project site is in a primarily residential area in the western portion of Manteca and is within the jurisdiction of the CVRWQCB. Utilities and service systems are available at the Project site and are described in detail below.

3.19.1.1 Water

The City of Manteca's water supply is primarily sourced by surface water purchased from the SSJID's South County Water Supply Program and local groundwater wells. The City also uses recycled water for irrigation and dust control. Treated surface water is supplied by SSJID'S South County Water Supply Program from the Stanislaus River and is dependent on New Melones Reservoir inflow. The City owns and operates 15 potable groundwater wells and 32 irrigation wells that provide groundwater to Manteca residents. In addition, recycled water, produced at the City's Wastewater Quality Control Facility, is used for cropland irrigation and dust control (City of Manteca 2017).

3.19.1.2 Wastewater

The City provides wastewater services through collection infrastructure and its Wastewater Quality Control Facility. This 22-acre facility is located at 2450 West Yosemite Avenue and services the cities of Manteca and Lathrop. The facility has allocated 8.42 million gallons per day of plant capacity to the City of Manteca (City of Manteca 2017).

3.19.1.3 Stormwater and Drainage

The City maintains 150 miles of pipelines, 52 pump stations, and 54 detention basins to control stormwater and drainage. Stormwater is pumped to SSJID's network of irrigation laterals and drains and carried to the San Joaquin River (City of Manteca 2017).

3.19.1.4 Solid Waste

The Project site is serviced by the City of Manteca Solid Waste Division. The City's solid waste is collected and carried to the Lovelace Transfer Station. Recyclables are taken to Sacramento Recycling, and remaining solid waste is discarded at the Forward Sanitary Landfill. The Forward Sanitary Landfill is permitted to accept 46,080 tons of solid waste per week and has a total capacity of 51,040,000 cubic yards of inert or designated wastes. The landfill has a remaining capacity of 23.7 million cubic yards and is expected to reach capacity by 2021 (City of Manteca 2017).

3.19.1.5 Power

Electrical and natural gas is serviced to Manteca and the Project site by PG&E. Electric power is generated from various sources, including hydroelectric powerhouses, Diablo Canyon Power Plan, and small fossil-fired power plants (City of Manteca 2017).

The Project site includes PG&E overhead transmission lines on both the east and west sides of Airport Way.

3.19.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. During construction, the Project will require water for dust control and will generate minimal wastewater. The amount of water required and wastewater anticipated to be generated during construction will be minimal and will occur on a temporary basis for the duration of construction activities. Per the City of Manteca General Plan Existing Conditions Report, tertiary-treated recycled water is used for dust control at construction sites. No new water treatment or wastewater treatment facilities will have to be provided in association with Project construction. Operation of the Project will not result in any new residences or businesses and will therefore not require additional water or need to treat additional wastewater above what is occurring under existing conditions. Implementation of the Project will not require or result in the relocation or construction of new or expanded water or wastewater treatment infrastructure and/or facilities of which would cause significant environmental impacts.

Stormwater drainage infrastructure will be upgraded as part of the proposed Project. The Project includes the construction of seven percolation basins for on-site stormwater treatment. The design and construction of the percolation basins will comply with the City's Storm Drain Master Plan (2013b), with capacity to detain stormwater runoff volume of a 10-year, 48-hour-duration storm within 96 hours. Construction of the percolation basins will be performed in compliance with the

City of Manteca Storm Water Management Program, as well as the NPDES regulations. Implementation of the Project will not require or result in the relocation or construction of new or expanded stormwater drainage infrastructure and/or facilities of which would cause significant environmental impacts.

Electrical distribution and transmission overhead lines, owned by PG&E, will need to be relocated as part of the proposed Project. The overhead transmission line on the west side of Airport Way will be relocated to allow for widening activities associated with the Project. The distribution overhead line on the east side of Airport Way will be undergrounded. These relocations will occur with PG&E supervision. Natural gas lines and telecommunication lines will not need to be relocated due to Project implementation. Implementation of the Project will not require or result in the relocation or construction of new or expanded electrical, natural gas, and telecommunications infrastructure and/or facilities of which would cause significant environmental impacts.

Overall, impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. Water demand for dust control operations during Project construction would be minimal. Recycled water would be used for dust control during construction, in accordance with the City of Manteca General Plan. No further water supplies will be required to serve construction of the Project, and operation will not require water service. As such, impacts will be less than significant and no mitigation is required.

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

NO IMPACT. During construction of the Project, workers on site will generate a nominal amount of wastewater. Any amount of wastewater generated by construction workers will be hauled away and adequately treated off site by existing wastewater treatment facilities in the City. As the Project is a roadway widening project, wastewater will not be generated during its operation. Existing City wastewater treatment facilities will provide adequate treatment and adequate capacity to serve the project's projected generation during construction activities. No impact will occur and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The State of California has set a goal of 75 percent recycling, composting or source reduction of solid waste by 2020. The Project will temporarily generate solid waste during construction. Solid waste generated during construction will be minimal and will have no effect on the Forward Sanitary Landfill's capacity to serve other solid waste disposal requirements. Once construction of the Project is completed, the Project will not generate solid

waste. Therefore, the Forward Sanitary Landfill will have sufficient permitted capacity to accommodate the Project's solid waste disposal needs. The proposed Project will not generate solid waste in excess of State or local standards, or in excess of local infrastructure or otherwise impair the attainment of solid waste reduction goals. Impacts will be less than significant and no mitigation is required.

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

NO IMPACT. The Project will comply with federal, State, and local regulations related to solid waste. No impact would occur and no mitigation is required.

3.20 WILDFIRE

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

3.20.1 Environmental Setting

According to the CalFire Fire Hazard Severity Zones Map website, the City of Manteca, and the project is not located in a State Responsibility Area (SRA) or Local Responsibility Area classified as a Very High Fire Hazard Severity Zone.[7] The project site is located on relatively flat land and hilly or mountainous terrain does not exist adjacent to the site. The site is also located in a relatively urban portion of Manteca with surrounding land occupied by single-family residential units, agricultural land, and commercial uses. Land occupied by such uses typically are less susceptible to wildfires than land occupied by heavy vegetation, which fuels such conflagrations.

3.20.2 Impact Analysis

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

LESS THAN SIGNIFICANT IMPACT. Please refer to the discussion under Threshold 3.9(f). The Project would improve existing traffic circulation and would benefit emergency response. The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Impacts will be less than significant and no mitigation is required.

[7] CalFire Fire Hazard Severity Zones Maps San Joaquin County 2007. Website: https://osfm.fire.ca.gov/divisions/wildfire-prevention-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/ (accessed on October 2, 2019).

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

LESS THAN SIGNIFICANT IMPACT. The Project site is located on Airport Way, between Daniels Street and just north of Yosemite Avenue, in the City of Manteca. Topography on and adjacent to the Project site is relatively flat. Wildfires are typically intensified in areas with heavy fuel loads (vegetation), fire weather (winds, high temperatures, low humidity levels, and low fuel moisture content), and steep topographical areas (mountainous and hilly areas). The Project site is not located in an area that is considered to be at significant risk to wildfires since it is in an urbanized, developed area, the site and surrounding area is topographically flat, and uses in the Project area have low susceptibility to conflagrations driven by fire weather. As such, the proposed Project will not expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Impacts will be less than significant and no mitigation is required.

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

LESS THAN SIGNIFICANT IMPACT. The Project consists of widening Airport Way from the existing two-lanes to a six-lane arterial roadway. Airport Way will first be widened to a four-lane facility while funding is secured to complete the six-lane widening project. The Project will ultimately include three travel lanes in each direction, a raised median, a 5-foot wide Class II bike lane in each direction, curb and gutter improvements, and a 6-foot wide sidewalk on each side of the street. A total of seven percolation basins for on-site stormwater treatment will be developed and electrical distribution and transmission overhead lines on the east side of the Project site will be relocated while those on the west side will be undergrounded. The Project will not require the installation or maintenance of infrastructure that may exacerbate fire risk. Impacts will be less than significant and mitigation is not required.

c. 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?

LESS THAN SIGNIFICANT IMPACT. The Project site is located in an urbanized portion of Manteca in a topographically flat area. The Project site is located in flood Zone X as designated by FEMA. Due to the urbanized nature of the site, and its distance from hilly/mountainous terrain, the Project has a low susceptibility to downslope or downstream flooding, landslides, or runoff, as a result from post-fire slope instability, or drainage changes. Impacts will be less than significant and no mitigation is required.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

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

3.21.1 Impact Analysis

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

LESS THAN SIGNIFICANT WITH MITIGATION. The Project would include the widening of Airport Way. As described in this IS, implementation of the Project would have the potential to adversely impact Swainson's hawk, burrowing owl, and designated habitat, as well as previously undiscovered cultural resources and/or human remains. With implementation of the mitigation measures recommended in this IS, compliance with City of Manteca requirements, and application of standard practices, development of the Project would not: (1) degrade the quality of the environment; (2) substantially reduce the habitat of a fish or wildlife species; (3) cause a fish or wildlife population to drop below self-sustaining levels; (4) threaten to eliminate a plant or animal community; (5) reduce the number or restrict the range of a rare or endangered plant or animal; or (6) 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)?

LESS THAN SIGNIFICANT IMPACT. The impacts of the Project would be individually limited and not cumulatively considerable. The Project would include the widening of Airport Way from an existing

two-lane roadway to a six-lane roadway. All environmental impacts that could occur as a result of the Project would be reduced to a less than significant level with implementation of the mitigation measures recommended throughout this IS. When viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, development of this Project would not cumulatively contribute to impacts.

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

LESS THAN SIGNIFICANT WITH MITIGATION. The purpose of the Project is to widen an existing roadway within Manteca to improve circulation and safety and provide access for emergency response vehicles. As described in this IS, implementation of the Project could result in temporary air quality, biology, cultural resources, hazardous materials, and noise impacts during the construction period. Implementation of the mitigation measures recommended in this IS, compliance with City regulations, and application of standard construction practices would ensure that the Project would not result in environmental impacts that would cause substantial direct or indirect adverse impacts on human beings.

4.0 LIST OF PREPARERS

4.1 OFFICE LOCATION

LSA Associates, Inc.
Roseville Office
201 Creekside Ridge Court, Suite 250
Roseville, California 95678

4.2 KEY PERSONNEL

Laura Lafler, Principal Environmental Planner
Edward Heming, Associate/Environmental Planner and Project Manager
Chris Graham, Environmental Planner
Kim Untermoser, Assistant Environmental Planner
Cara Carlucci, Air Quality Analyst/Planner
Mike Trueblood, Senior Biologist
Katie Vallaire, Cultural Resources Manager

This page intentionally left blank

5.0 REFERENCES

California Air Resources Board (CARB). 2005. *Air Quality and Land Use Handbook.* April. Website: https://www.arb.ca.gov/ch/handbook.pdf (accessed October 26, 2018).

_____. 2018. iADAM: Air Quality Data Statistics: Top 4 Summary. Website: https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed October 2018).

California Department of Conservation. 2018. Rural Land Mapping Edition, San Joaquin County Important Farmland 2016. Website: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2016/sjq16.pdf (accessed August 22, 2017).

California Department of Fish and Wildlife. 2012. *Staff Report on Burrowing Owls.* Sacramento.

California Department of Toxic Substances Control. 2018. EnviroStor. Website: https://www.envirostor.dtsc.ca.gov/public/ (accessed August 22, 2018).

California Department of Transportation (Caltrans). 2018. California Scenic Highway Mapping System, San Joaquin County. Website: http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm (accessed November 28, 2018).

California Office of Historic Preservation (OHP). 1976. California Inventory of Historic Resources. California Department of Parks and Recreation, Sacramento.

_____. 1988. *Five Views: An Ethnic Historic Sites Survey for California.* California Department of Parks and Recreation, Sacramento.

_____. 1992. California Points of Historical Interest. California Department of Parks and Recreation, Sacramento.

_____. 1996. California Historical Landmarks. California Department of Parks and Recreation, Sacramento.

_____. 2012. Directory of Properties in the Historic Property Data File. April 5. California Department of Parks and Recreation, Sacramento.

California State Water Resources Control Board. 2015. GeoTracker. Revised 2018. Website: https://geotracker.waterboards.ca.gov/ (accessed August 22, 2018).

City of Manteca. 2003a. Storm Water Management Program. July 28. Website: https://www.ci.manteca.ca.us/pwt/documents/swmp072803.pdf (accessed August 21, 2018).

_____. 2003b. Bicycle Master Plan. September.

_____. 2003c. General Plan 2023. October 6. Website: https://www.ci.manteca.ca.us/Community Development/Documents/City%20of%20Manteca%20General%20Plan.pdf (accessed August 16, 2018).

_____. 2013a. Climate Action Plan. October 15. Website: http://www.ci.manteca.ca.us/community development/Documents/Final%20Climate%20Action%20Plan.pdf (accessed October 26, 2018).

_____. 2013b. Storm Drain Master Plan. Website: https://www.ci.manteca.ca.us/pwt/Documents/ StormDrainMasterPlanFinal/2013_SDMP_Entire_Set%20(Final).pdf (accessed December 20, 2018).

_____. 2017. General Plan Update Existing Conditions Report. October. Website: https://manteca.generalplan.org/content/documents (accessed August 16, 2018).

_____. 2018. Public Facilities Implementation Plan, Section 8, Transportation. Website: https://www.ci.manteca.ca.us/pwt/Documents/PFIP/CHAPTER%208%20-Transportation %20Element_effective%20January%201,%202018.pdf (accessed November 30, 2018).

_____. n.d. General Plan Update FAQ. Website: https://manteca.generalplan.org/content/faq (accessed November 12, 2018).

County of San Joaquin. 2000. San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). November 14. Website: https://www.sjcog.org/DocumentCenter/ View/5/Habitat-Planpdf?bidId (accessed August 16, 2018).

_____. 2016. San Joaquin County General Plan Policy Document. December Website: https://www.sjgov.org/commdev/cgi-bin/cdyn.exe/file/Planning/General%20Plan%202035/ GENERAL%20PLAN%202035.pdf (accessed August 17, 2018).

_____. 2018. County Assessor ParcelQuest. Website: https://assr.parcelquest.com/Home/Index (accessed August 27, 2018).

Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment*.

Harris, Cyril M. 1991. *Handbook of Acoustical Measurements and Noise Control*. Subsequent Edition.

_____. 1998. *Handbook of Acoustical Measurements and Noise Control*. 1998 Edition.

Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC*.

JRP Historical Consulting and California Department of Transportation (JRP and Caltrans). 1993. *Mojave Natural Gas Pipeline Northern Extension Project. Field surveys and evaluations, 1993-1995.*

LSA. 2018a. *Cultural Resources Study.* December.

_____. 2018b. *Noise Impact Analysis Modeling.* October.

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2007. *2007 PM_{10} Maintenance Plan and Request for Redesignation*. September 20. Website: http://www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed August 27, 2018).

_____. 2013. *2013 Plan for the Revoked 1-Hour Ozone Standard*. September 19. Website: http://www.valleyair.org/Air_Quality_Plans/Ozone-OneHourPlan-2013.htm (accessed August 27, 2018).

_____. 2015a. *2015 Plan for the 1997 $PM_{2.5}$ Standard*. April 16. Website: http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm (accessed August 27, 2018).

_____. 2015b. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19. Website: www.valleyair.org/transportation/ceqa_idx.htm (accessed August 27, 2018).

_____. 2016. *2016 Plan for the 2008 8-Hour Ozone Standard*. June 16. Website: www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm (accessed August 27, 2018).

San Joaquin Valley Gateway. 2015. San Joaquin County Williamson Act Parcels, 08/2015. Last updated September 15, 2015. Website: https://sjvp.databasin.org/datasets/a32f8f44b4524b07b1861e779a0857c0 (accessed August 22, 2018).

Transportation Research Board. 2010. *Highway Capacity Manual*, 5th Edition.

United States Census Bureau. 2010. *Profile of General Population and Housing Characteristics: 2010.*

United States Environmental Protection Agency. 2018. Monitor Values Report. Website: https://www.epa.gov/outdoor-air-quality-data/monitor-values-report. (accessed October 2018).

United States Department of Agriculture (USDA). 2003. National Cooperative Soil Survey Bisgani Series. May. Website: https://soilseries.sc.egov.usda.gov/OSD_Docs/B/BISGANI.html (accessed August 20, 2018).

This page intentionally left blank

APPENDIX A

AIR QUALITY IMPACT ANALYSIS

This page intentionally left blank

Road Construction Emissions Model **Version 9.0.0**
Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Airport Way Widening Project	
Construction Start Year	2021	Enter a Year between 2014 and 2040 (inclusive)
Project Type	2	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	6.00	months
Working Days per Month	20.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.90	miles
Total Project Area	15.20	acres
Maximum Area Disturbed/Day	6.00	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation	20.00		15500.00
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing		0.60		1/1/2021
Grading/Excavation		2.40		1/20/2021
Drainage/Utilities/Sub-Grade		2.10		4/3/2021
Paving		0.90		6/6/2021
Totals (Months)	6			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		775	23250.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Paving (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	2.14	21.67	163.03	5.73	2.51	0.86	91,202.13	0.10	14.34	95,476.65
Tons per const. Period - Grading/Excavation	0.05	0.52	3.91	0.14	0.06	0.02	2,188.85	0.00	0.34	2,291.44
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.05	0.52	3.91	0.14	0.06	0.02	2,188.85	0.00	0.34	2,291.44

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Paving (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions User Input	User Override of Worker Commute Default Values	Default Values		
Miles/ one-way trip		20	Calculated Daily Trips	Calculated Daily VMT
One-way trips/day		2		
No. of employees: Grubbing/Land Clearing		9	18	360.00
No. of employees: Grading/Excavation		32	64	1,280.00
No. of employees: Drainage/Utilities/Sub-Grade		25	50	1,000.00
No. of employees: Paving		17	34	680.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Grading/Excavation (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Draining/Utilities/Sub-Grade (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Paving (grams/mile)	0.02	1.10	0.10	0.05	0.02	0.00	339.80	0.00	0.01	342.28
Grubbing/Land Clearing (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Grading/Excavation (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Draining/Utilities/Sub-Grade (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39
Paving (grams/trip)	1.18	2.95	0.34	0.00	0.00	0.00	72.81	0.08	0.04	85.39

Emissions	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.06	0.99	0.09	0.04	0.02	0.00	272.57	0.01	0.01	275.04
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	1.64	0.00	0.00	1.65
Pounds per day - Grading/Excavation	0.22	3.52	0.32	0.13	0.05	0.01	969.15	0.03	0.03	977.93
Tons per const. Period - Grading/Excavation	0.01	0.08	0.01	0.00	0.00	0.00	23.26	0.00	0.00	23.47
Pounds per day - Drainage/Utilities/Sub-Grade	0.17	2.75	0.25	0.10	0.04	0.01	757.15	0.02	0.02	764.01
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.06	0.01	0.00	0.00	0.00	15.90	0.00	0.00	16.04
Pounds per day - Paving	0.12	1.87	0.17	0.07	0.03	0.01	514.86	0.01	0.01	519.53
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	4.63	0.00	0.00	4.68
Total tons per construction project	0.01	0.17	0.02	0.01	0.00	0.00	45.43	0.00	0.00	45.84

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions User Input	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
Grubbing/Land Clearing - Exhaust		2		5	10		8.00	80.00
Grading/Excavation - Exhaust		2		5	10		8.00	80.00
Drainage/Utilities/Subgrade		1		5	5		8.00	40.00
Paving		1		5	5		8.00	40.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grading/Excavation (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Draining/Utilities/Sub-Grade (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Paving (grams/mile)	0.04	0.42	3.06	0.11	0.05	0.02	1,779.29	0.00	0.28	1,862.69
Grubbing/Land Clearing (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	3.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.01	0.07	0.62	0.02	0.01	0.00	313.81	0.00	0.05	328.52
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	1.97
Pounds per day - Grading/Excavation	0.01	0.07	0.62	0.02	0.01	0.00	313.81	0.00	0.05	328.52
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	7.53	0.00	0.00	7.88
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.04	0.31	0.01	0.00	0.00	156.91	0.00	0.02	164.26
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	3.30	0.00	0.00	3.45
Pounds per day - Paving	0.00	0.04	0.31	0.01	0.00	0.00	156.91	0.00	0.02	164.26
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	1.41	0.00	0.00	1.48
Total tons per construction project	0.00	0.00	0.03	0.00	0.00	0.00	14.12	0.00	0.00	14.78

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		6.00	60.00	0.36	12.48	0.07
Fugitive Dust - Grading/Excavation		6.00	60.00	1.44	12.48	0.30
Fugitive Dust - Drainage/Utilities/Subgrade		6.00	60.00	1.26	12.48	0.26

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Crawler Tractors	1.10	4.87	13.94	0.52	0.48	0.02	1,520.73	0.49	0.01	1,537.12
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Excavators	0.69	9.82	6.46	0.31	0.29	0.02	1,500.58	0.49	0.01	1,516.76
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	1.90	15.29	21.12	0.87	0.80	0.03	3,119.93	0.99	0.03	3,153.01
Grubbing/Land Clearing	tons per phase	0.01	0.09	0.13	0.01	0.00	0.00	18.72	0.01	0.00	18.92

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Cranes	0.41	1.98	4.85	0.20	0.18	0.01	558.74	0.18	0.01	564.76
	2		Model Default Tier	Crawler Tractors	1.10	4.87	13.94	0.52	0.48	0.02	1,520.73	0.49	0.01	1,537.12
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Excavators	0.92	13.09	8.61	0.42	0.38	0.02	2,000.77	0.65	0.02	2,022.34
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Graders	1.36	5.30	17.77	0.56	0.52	0.02	1,925.05	0.62	0.02	1,945.79
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Rollers	0.57	5.64	5.77	0.35	0.32	0.01	762.27	0.25	0.01	770.48
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Rubber Tired Loaders	0.69	3.20	7.73	0.26	0.24	0.01	1,210.45	0.39	0.01	1,223.53
	3		Model Default Tier	Scrapers	2.79	21.01	32.11	1.25	1.15	0.05	4,403.74	1.42	0.04	4,451.22
	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5		Model Default Tier	Tractors/Loaders/Backhoes	0.94	11.30	9.48	0.56	0.51	0.02	1,504.50	0.49	0.01	1,520.69
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	8.88	67.00	100.98	4.15	3.82	0.15	13,984.88	4.50	0.13	14,135.06
	Grading/Excavation	tons per phase	0.21	1.61	2.42	0.10	0.09	0.00	335.64	0.11	0.00	339.24

Drainage/Utilities/Subgrade

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Air Compressors	0.58	4.85	4.07	0.25	0.25	0.01	750.53	0.05	0.01	753.50
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Generator Sets	0.71	7.37	6.33	0.34	0.34	0.01	1,246.07	0.06	0.01	1,250.45
	2		Model Default Tier	Graders	0.91	3.53	11.85	0.38	0.35	0.01	1,283.37	0.42	0.01	1,297.19
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Plate Compactors	0.08	0.42	0.50	0.02	0.02	0.00	68.96	0.01	0.00	69.31
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Pumps	0.76	7.48	6.42	0.36	0.36	0.01	1,246.07	0.07	0.01	1,250.56
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Rough Terrain Forklifts	0.25	4.59	3.22	0.12	0.11	0.01	667.54	0.22	0.01	674.73
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Scrapers	1.86	14.01	21.41	0.83	0.77	0.03	2,935.83	0.95	0.03	2,967.48
	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Tractors/Loaders/Backhoes	0.75	9.04	7.58	0.45	0.41	0.01	1,203.60	0.39	0.01	1,216.56
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade	pounds per day	6.02	51.89	62.11	2.77	2.63	0.10	9,500.59	2.17	0.08	9,578.91
	Drainage/Utilities/Sub-Grade	tons per phase	0.13	1.09	1.30	0.06	0.06	0.00	199.51	0.05	0.00	201.16

Paving

Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Pavers	0.49	5.81	5.19	0.25	0.23	0.01	910.12	0.29	0.01	919.93
	2		Model Default Tier	Paving Equipment	0.38	5.08	3.88	0.19	0.18	0.01	788.91	0.26	0.01	797.43
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Rollers	0.57	5.64	5.77	0.35	0.32	0.01	762.27	0.25	0.01	770.48
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			Model Default Tier	Scrapers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Signal Boards		0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Tractors/Loaders/Backhoes		0.75	9.04	7.58	0.45	0.41	0.01	1,203.60	0.39	0.01	1,216.56
			Model Default Tier	Trenchers		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab					ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Number of Vehicles			Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Paving			pounds per day		2.31	26.18	23.15	1.27	1.17	0.04	3,763.53	1.20	0.03	3,803.52
	Paving			tons per phase		0.02	0.24	0.21	0.01	0.01	0.00	33.87	0.01	0.00	34.23
Total Emissions all Phases (tons per construction period) =>						0.37	3.03	4.06	0.17	0.16	0.01	587.74	0.17	0.01	593.55

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Airport Way Widening Project

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.97	16.35	21.82	60.92	0.92	60.00	13.30	0.82	12.48	0.04	3,706.32	1.00	0.09	3,756.57
Grading/Excavation	11.26	92.27	264.95	70.03	10.03	60.00	18.87	6.39	12.48	1.02	106,469.97	4.63	14.54	110,918.16
Drainage/Utilities/Sub-Grade	6.19	54.68	62.67	62.88	2.88	60.00	15.15	2.67	12.48	0.11	10,414.65	2.19	0.13	10,507.18
Paving	2.43	28.09	23.63	1.35	1.35	0.00	1.20	1.20	0.00	0.05	4,435.30	1.21	0.07	4,487.31
Maximum (pounds/day)	11.26	92.27	264.95	70.03	10.03	60.00	18.87	6.39	12.48	1.02	106,469.97	4.63	14.54	110,918.16
Total (tons/construction project)	0.43	3.71	8.02	3.38	0.32	3.06	0.86	0.23	0.64	0.03	2,836.14	0.17	0.35	2,945.61

Notes:

Project Start Year ->	2021
Project Length (months) ->	6
Total Project Area (acres) ->	15
Maximum Area Disturbed/Day (acres) ->	6
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	360	80
Grading/Excavation	15,500	0	23,250	0	1,280	80
Drainage/Utilities/Sub-Grade	0	0	0	0	1,000	40
Paving	0	0	0	0	680	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Airport Way Widening Project

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.10	0.13	0.37	0.01	0.36	0.08	0.00	0.07	0.00	22.24	0.01	0.00	20.45
Grading/Excavation	0.27	2.21	6.36	1.68	0.24	1.44	0.45	0.15	0.30	0.02	2,555.28	0.11	0.35	2,414.98
Drainage/Utilities/Sub-Grade	0.13	1.15	1.32	1.32	0.06	1.26	0.32	0.06	0.26	0.00	218.71	0.05	0.00	200.17
Paving	0.02	0.25	0.21	0.01	0.01	0.00	0.01	0.01	0.00	0.00	39.92	0.01	0.00	36.64
Maximum (tons/phase)	0.27	2.21	6.36	1.68	0.24	1.44	0.45	0.15	0.30	0.02	2555.28	0.11	0.35	2,414.98
Total (tons/construction project)	0.43	3.71	8.02	3.38	0.32	3.06	0.86	0.23	0.64	0.03	2836.14	0.17	0.35	2,672.24

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

APPENDIX B

SPECIES LISTS

This page intentionally left blank

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Lathrop (3712173) OR Manteca (3712172) OR Vernalis (3712163) OR Ripon (3712162))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Anthicus sacramento Sacramento anthicid beetle	IICOL49010	None	None	G1	S1	
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G2	S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T3	S3	WL
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Cirsium crassicaule slough thistle	PDAST2E0U0	None	None	G1	S1	1B.1
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Elderberry Savanna Elderberry Savanna	CTT63440CA	None	None	G2	S2.1	
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Great Valley Valley Oak Riparian Forest						
Lanius ludovicianus	ABPBR01030	None	None	G4	S4	SSC
loggerhead shrike						
Lepidurus packardi	ICBRA10010	Endangered	None	G4	S3S4	
vernal pool tadpole shrimp						
Linderiella occidentalis	ICBRA06010	None	None	G2G3	S2S3	
California linderiella						
Lytta moesta	IICOL4C020	None	None	G2	S2	
moestan blister beetle						
Melospiza melodia	ABPBXA3010	None	None	G5	S3?	SSC
song sparrow ("Modesto" population)						
Mylopharodon conocephalus	AFCJB25010	None	None	G3	S3	SSC
hardhead						
Neotoma fuscipes riparia	AMAFF08081	Endangered	None	G5T1Q	S1	SSC
riparian (=San Joaquin Valley) woodrat						
Oncorhynchus mykiss irideus pop. 11	AFCHA0209K	Threatened	None	G5T2Q	S2	
steelhead - Central Valley DPS						
Puccinellia simplex	PMPOA53110	None	None	G3	S2	1B.2
California alkali grass						
Spea hammondii	AAABF02020	None	None	G3	S3	SSC
western spadefoot						
Spirinchus thaleichthys	AFCHB03010	Candidate	Threatened	G5	S1	
longfin smelt						
Sylvilagus bachmani riparius	AMAEB01021	Endangered	Endangered	G5T1	S1	
riparian brush rabbit						
Trichocoronis wrightii var. wrightii	PDAST9F031	None	None	G4T3	S1	2B.1
Wright's trichocoronis						
Xanthocephalus xanthocephalus	ABPBXB3010	None	None	G5	S3	SSC
yellow-headed blackbird						

Record Count: 34

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

San Joaquin County, California

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Riparian Brush Rabbit Sylvilagus bachmani riparius No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/6189	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake Thamnophis gigas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS

California Red-legged Frog Rana draytonii — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/2891

California Tiger Salamander Ambystoma californiense — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/2076

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp Branchinecta lynchi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31
Costa's Hummingbird Calypte costae This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9470	Breeds Jan 15 to Jun 10
Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20
Oak Titmouse Baeolophus inornatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Song Sparrow Melospiza melodia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Feb 20 to Sep 5

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▪)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

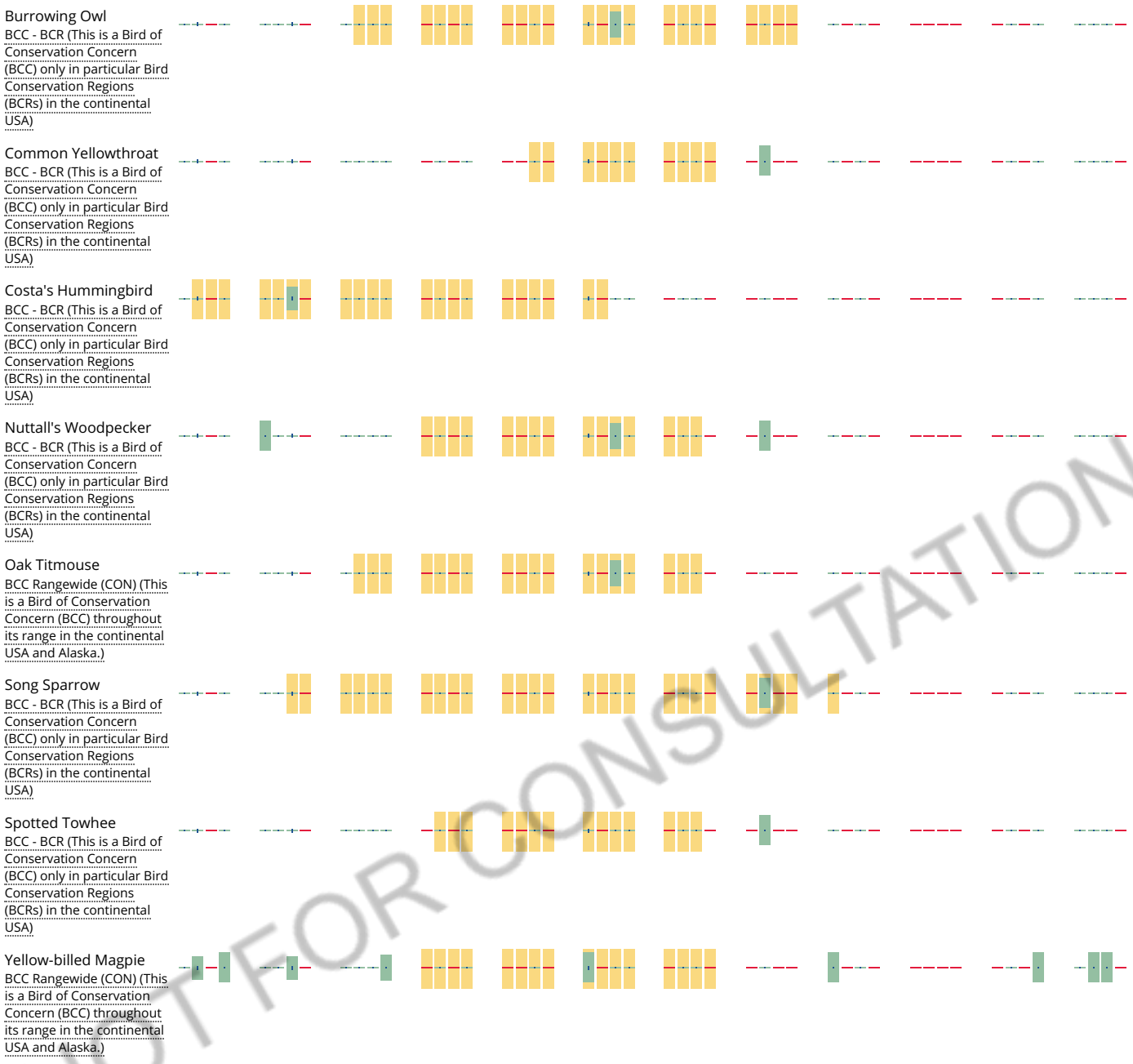
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

RIVERINE

- R5UBFx
- R2UBHx

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

8 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads **3712173, 3712172 3712163** and **3712162**;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Cirsium crassicaule	slough thistle	Asteraceae	annual / perennial herb	May-Aug	1B.1	S1	G1
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	S1	G1
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	2B.1	S1	G4T3

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 08 October 2019].

Search the Inventory

Simple Search

Advanced Search

Glossary

Information

About the Inventory

About the Rare Plant Program

CNPS Home Page

About CNPS

Join CNPS

Contributors

The Calflora Database

The California Lichen Society

California Natural Diversity Database

The Jepson Flora Project

The Consortium of California Herbaria

CalPhotos

Questions and Comments

rareplants@cnps.org

APPENDIX C

TRIP GENERATION AND TRAFFIC COUNTS

This page intentionally left blank

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	25	180	45	95	215	180	80	210	105	200	260
Future Volume (vph)	5	25	180	45	95	215	180	80	210	105	200	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.93		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1687	3258		1687	3108		1687	1776	1486	1687	1776
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1687	3258		1687	3108		1687	1776	1486	1687	1776
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	28	200	50	106	239	200	89	233	117	222	289
RTOR Reduction (vph)	0	0	24	0	0	140	0	0	0	91	0	0
Lane Group Flow (vph)	0	34	226	0	106	299	0	89	233	26	222	289
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		1.8	15.3		5.4	19.3		5.9	14.6	14.6	11.1	19.8
Effective Green, g (s)		1.8	15.3		5.4	19.3		5.9	14.6	14.6	11.1	19.8
Actuated g/C Ratio		0.03	0.24		0.08	0.30		0.09	0.23	0.23	0.17	0.31
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		46	769		140	925		153	400	334	288	542
v/s Ratio Prot		0.02	0.07		c0.06	c0.10		0.05	0.13		c0.13	c0.16
v/s Ratio Perm										0.02		
v/c Ratio		0.74	0.29		0.76	0.32		0.58	0.58	0.08	0.77	0.53
Uniform Delay, d1		31.3	20.3		29.1	17.7		28.3	22.4	19.8	25.6	18.7
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		46.3	0.2		20.6	0.2		5.5	2.2	0.1	12.0	1.0
Delay (s)		77.5	20.5		49.6	17.9		33.8	24.5	19.9	37.6	19.7
Level of Service		E	C		D	B		C	C	B	D	B
Approach Delay (s)			27.4			24.1			25.2			25.7
Approach LOS			C			C			C			C

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	64.8	Sum of lost time (s)	18.4
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

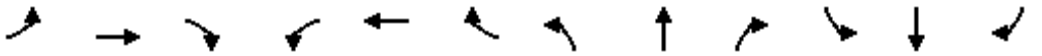
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	85
Future Volume (vph)	85
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1490
Flt Permitted	1.00
Satd. Flow (perm)	1490
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	94
RTOR Reduction (vph)	65
Lane Group Flow (vph)	29
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	19.8
Effective Green, g (s)	19.8
Actuated g/C Ratio	0.31
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	455
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.06
Uniform Delay, d1	15.9
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	16.0
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	45	350	115	25	375
Future Volume (Veh/h)	50	45	350	115	25	375
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	56	50	389	128	28	417
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	928	456			519	
vC1, stage 1 conf vol	455					
vC2, stage 2 conf vol	473					
vCu, unblocked vol	928	456			519	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	89	92			97	
cM capacity (veh/h)	491	593			1020	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	106	517	445
Volume Left	56	0	28
Volume Right	50	128	0
cSH	534	1700	1020
Volume to Capacity	0.20	0.30	0.03
Queue Length 95th (ft)	18	0	2
Control Delay (s)	13.4	0.0	0.8
Lane LOS	B		A
Approach Delay (s)	13.4	0.0	0.8
Approach LOS	B		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	20	130	265	30	30	130	390	160	20	350	55
Future Volume (vph)	45	20	130	265	30	30	130	390	160	20	350	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	1776	1497	3273	1776	1509	3273	3374	1509	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3273	1776	1497	3273	1776	1509	3273	3374	1509	1687	3374	1509
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	22	144	294	33	33	144	433	178	22	389	61
RTOR Reduction (vph)	0	0	120	0	0	28	0	0	78	0	0	30
Lane Group Flow (vph)	50	22	24	294	33	5	144	433	100	22	389	31
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	3.3	7.5	13.4	8.4	12.6	12.6	5.9	44.3	44.3	1.9	40.3	40.3
Effective Green, g (s)	3.3	7.5	13.4	8.4	12.6	12.6	5.9	44.3	44.3	1.9	40.3	40.3
Actuated g/C Ratio	0.04	0.09	0.17	0.11	0.16	0.16	0.07	0.56	0.56	0.02	0.51	0.51
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	136	168	253	347	282	240	244	1889	845	40	1718	768
v/s Ratio Prot	0.02	0.01	0.01	c0.09	c0.02		c0.04	c0.13		0.01	0.12	
v/s Ratio Perm			0.01			0.00			0.07			0.02
v/c Ratio	0.37	0.13	0.10	0.85	0.12	0.02	0.59	0.23	0.12	0.55	0.23	0.04
Uniform Delay, d1	36.9	32.8	27.7	34.7	28.5	28.1	35.4	8.8	8.2	38.2	10.8	9.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.4	0.2	17.1	0.2	0.0	3.8	0.3	0.3	15.3	0.3	0.1
Delay (s)	38.6	33.2	27.9	51.9	28.7	28.1	39.2	9.1	8.5	53.5	11.1	9.8
Level of Service	D	C	C	D	C	C	D	A	A	D	B	A
Approach Delay (s)		30.9			47.6			14.7			12.9	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	10	140	400	140	240	235	230	85	350	195	225	385
Future Volume (vph)	10	140	400	140	240	235	230	85	350	195	225	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.96		1.00	0.93		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1736	3317		1736	3172		1736	1827	1526	1736	1827
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1736	3317		1736	3172		1736	1827	1526	1736	1827
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	156	444	156	267	261	256	94	389	217	250	428
RTOR Reduction (vph)	0	0	31	0	0	153	0	0	0	141	0	0
Lane Group Flow (vph)	0	167	569	0	267	364	0	94	389	76	250	428
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		13.5	21.9		19.0	27.8		5.7	27.2	27.2	15.9	37.4
Effective Green, g (s)		13.5	21.9		19.0	27.8		5.7	27.2	27.2	15.9	37.4
Actuated g/C Ratio		0.13	0.21		0.19	0.27		0.06	0.27	0.27	0.16	0.37
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		228	709		322	861		96	485	405	269	667
v/s Ratio Prot		0.10	c0.17		c0.15	0.11		0.05	c0.21		c0.14	0.23
v/s Ratio Perm										0.05		
v/c Ratio		0.73	0.80		0.83	0.42		0.98	0.80	0.19	0.93	0.64
Uniform Delay, d1		42.7	38.2		40.1	30.7		48.3	35.1	29.1	42.7	26.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		11.5	6.6		16.0	0.3		84.1	9.3	0.2	36.0	2.1
Delay (s)		54.2	44.8		56.1	31.0		132.4	44.4	29.3	78.7	29.1
Level of Service		D	D		E	C		F	D	C	E	C
Approach Delay (s)			46.8			39.6			51.5			45.7
Approach LOS			D			D			D			D

Intersection Summary			
HCM 2000 Control Delay	45.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	102.4	Sum of lost time (s)	18.4
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	40
Future Volume (vph)	40
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1533
Flt Permitted	1.00
Satd. Flow (perm)	1533
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	44
RTOR Reduction (vph)	28
Lane Group Flow (vph)	16
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	37.4
Effective Green, g (s)	37.4
Actuated g/C Ratio	0.37
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	559
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.03
Uniform Delay, d1	20.8
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	20.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	20	610	120	35	730
Future Volume (Veh/h)	30	20	610	120	35	730
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	22	678	133	39	811
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1636	748			813	
vC1, stage 1 conf vol	746					
vC2, stage 2 conf vol	889					
vCu, unblocked vol	1636	748			813	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	95			95	
cM capacity (veh/h)	303	408			804	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	55	811	850
Volume Left	33	0	39
Volume Right	22	133	0
cSH	338	1700	804
Volume to Capacity	0.16	0.48	0.05
Queue Length 95th (ft)	14	0	4
Control Delay (s)	17.7	0.0	1.3
Lane LOS	C		A
Approach Delay (s)	17.7	0.0	1.3
Approach LOS	C		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	295	100	420	110	80	20	525	415	175	35	420	305
Future Volume (vph)	295	100	420	110	80	20	525	415	175	35	420	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827	1541	3367	1827	1553	3367	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	1827	1541	3367	1827	1553	3367	3471	1553	1736	3471	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	328	111	467	122	89	22	583	461	194	39	467	339
RTOR Reduction (vph)	0	0	82	0	0	19	0	0	91	0	0	207
Lane Group Flow (vph)	328	111	385	122	89	3	583	461	103	39	467	132
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.9	21.0	41.9	8.9	15.0	15.0	20.9	59.0	59.0	5.0	43.1	43.1
Effective Green, g (s)	14.9	21.0	41.9	8.9	15.0	15.0	20.9	59.0	59.0	5.0	43.1	43.1
Actuated g/C Ratio	0.13	0.19	0.38	0.08	0.14	0.14	0.19	0.53	0.53	0.05	0.39	0.39
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	452	345	582	270	247	210	634	1846	826	78	1348	603
v/s Ratio Prot	c0.10	0.06	c0.12	0.04	0.05		c0.17	0.13		0.02	c0.13	
v/s Ratio Perm			0.13			0.00			0.07			0.08
v/c Ratio	0.73	0.32	0.66	0.45	0.36	0.01	0.92	0.25	0.12	0.50	0.35	0.22
Uniform Delay, d1	46.0	38.8	28.6	48.7	43.6	41.5	44.2	14.0	13.0	51.7	23.9	22.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.5	2.8	1.2	0.9	0.0	18.4	0.3	0.3	5.0	0.7	0.8
Delay (s)	51.8	39.3	31.4	49.9	44.5	41.6	62.6	14.3	13.3	56.7	24.7	23.5
Level of Service	D	D	C	D	D	D	E	B	B	E	C	C
Approach Delay (s)		39.8			47.0			36.9			25.7	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	70	260	55	95	645	215	180	545	250	350	495
Future Volume (vph)	5	70	260	55	95	645	215	180	545	250	350	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1687	3273		1687	3226		1687	1776	1482	1687	1776
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1687	3273		1687	3226		1687	1776	1482	1687	1776
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	78	289	61	106	717	239	200	606	278	389	550
RTOR Reduction (vph)	0	0	15	0	0	27	0	0	0	123	0	0
Lane Group Flow (vph)	0	84	335	0	106	929	0	200	606	155	389	550
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		6.2	25.9		10.5	30.6		16.8	39.6	39.6	25.6	48.4
Effective Green, g (s)		6.2	25.9		10.5	30.6		16.8	39.6	39.6	25.6	48.4
Actuated g/C Ratio		0.05	0.22		0.09	0.26		0.14	0.33	0.33	0.21	0.40
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		87	706		147	822		236	586	489	359	716
v/s Ratio Prot		0.05	0.10		c0.06	c0.29		0.12	c0.34		c0.23	0.31
v/s Ratio Perm										0.10		
v/c Ratio		0.97	0.47		0.72	1.13		0.85	1.03	0.32	1.08	0.77
Uniform Delay, d1		56.8	41.1		53.3	44.7		50.3	40.2	30.1	47.2	30.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		84.3	0.5		16.0	73.8		23.5	46.3	0.4	71.7	5.0
Delay (s)		141.1	41.6		69.3	118.5		73.8	86.5	30.4	118.9	35.9
Level of Service		F	D		E	F		E	F	C	F	D
Approach Delay (s)			60.9			113.6			69.8			57.4
Approach LOS			E			F			E			E

Intersection Summary			
HCM 2000 Control Delay	76.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

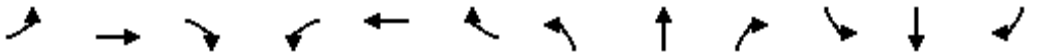
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	365
Future Volume (vph)	365
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1490
Flt Permitted	1.00
Satd. Flow (perm)	1490
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	406
RTOR Reduction (vph)	97
Lane Group Flow (vph)	309
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	48.4
Effective Green, g (s)	48.4
Actuated g/C Ratio	0.40
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	600
v/s Ratio Prot	
v/s Ratio Perm	0.21
v/c Ratio	0.52
Uniform Delay, d1	27.0
Progression Factor	1.00
Incremental Delay, d2	0.8
Delay (s)	27.7
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	145	50	925	120	25	620
Future Volume (Veh/h)	145	50	925	120	25	620
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	56	1028	133	28	689
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1842	1098			1163	
vC1, stage 1 conf vol	1096					
vC2, stage 2 conf vol	745					
vCu, unblocked vol	1842	1098			1163	
tC, single (s)	6.5	6.3			4.2	
tC, 2 stage (s)	5.5					
tF (s)	3.6	3.4			2.3	
p0 queue free %	38	78			95	
cM capacity (veh/h)	258	252			582	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	217	1161	717
Volume Left	161	0	28
Volume Right	56	133	0
cSH	256	1700	582
Volume to Capacity	0.85	0.68	0.05
Queue Length 95th (ft)	172	0	4
Control Delay (s)	65.4	0.0	1.3
Lane LOS	F		A
Approach Delay (s)	65.4	0.0	1.3
Approach LOS	F		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	25	285	370	35	70	570	865	335	60	620	85
Future Volume (vph)	110	25	285	370	35	70	570	865	335	60	620	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	1776	1502	3273	1776	1509	3273	3374	1509	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3273	1776	1502	3273	1776	1509	3273	3374	1509	1687	3374	1509
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	28	317	411	39	78	633	961	372	67	689	94
RTOR Reduction (vph)	0	0	37	0	0	67	0	0	184	0	0	56
Lane Group Flow (vph)	122	28	280	411	39	11	633	961	188	67	689	38
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	7.9	23.0	14.0	12.9	12.9	15.1	45.8	45.8	5.9	36.6	36.6
Effective Green, g (s)	9.0	7.9	23.0	14.0	12.9	12.9	15.1	45.8	45.8	5.9	36.6	36.6
Actuated g/C Ratio	0.10	0.09	0.25	0.15	0.14	0.14	0.17	0.51	0.51	0.07	0.40	0.40
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	325	154	381	505	252	214	545	1705	762	109	1363	609
v/s Ratio Prot	0.04	0.02	c0.12	c0.13	0.02		c0.19	c0.28		0.04	0.20	
v/s Ratio Perm			0.06			0.01			0.12			0.03
v/c Ratio	0.38	0.18	0.73	0.81	0.15	0.05	1.16	0.56	0.25	0.61	0.51	0.06
Uniform Delay, d1	38.2	38.4	31.0	37.0	34.1	33.6	37.8	15.5	12.7	41.2	20.2	16.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.6	7.2	9.7	0.3	0.1	91.5	1.4	0.8	9.9	1.3	0.2
Delay (s)	38.9	38.9	38.2	46.8	34.4	33.7	129.3	16.8	13.4	51.1	21.6	16.7
Level of Service	D	D	D	D	C	C	F	B	B	D	C	B
Approach Delay (s)		38.4			43.9			52.4			23.4	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

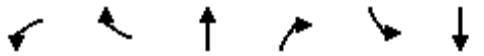
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	270	510	115	325	335	315	185	840	385	340	795
Future Volume (vph)	5	270	510	115	325	335	315	185	840	385	340	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.93		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1736	3362		1736	3176		1736	1827	1525	1736	1827
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1736	3362		1736	3176		1736	1827	1525	1736	1827
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	300	567	128	361	372	350	206	933	428	378	883
RTOR Reduction (vph)	0	0	16	0	0	142	0	0	0	86	0	0
Lane Group Flow (vph)	0	306	679	0	361	580	0	206	933	342	378	883
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		13.2	24.6		15.2	27.0		9.6	46.2	46.2	15.6	52.2
Effective Green, g (s)		13.2	24.6		15.2	27.0		9.6	46.2	46.2	15.6	52.2
Actuated g/C Ratio		0.11	0.21		0.13	0.22		0.08	0.39	0.39	0.13	0.44
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		190	689		219	714		138	703	587	225	794
v/s Ratio Prot		0.18	c0.20		c0.21	0.18		0.12	c0.51		c0.22	0.48
v/s Ratio Perm										0.22		
v/c Ratio		1.61	0.99		1.65	0.81		1.49	1.33	0.58	1.68	1.11
Uniform Delay, d1		53.4	47.5		52.4	44.1		55.2	36.9	29.3	52.2	33.9
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		297.8	30.4		311.4	7.0		256.0	157.0	1.5	324.6	67.3
Delay (s)		351.2	77.9		363.8	51.1		311.2	193.9	30.7	376.8	101.2
Level of Service		F	E		F	D		F	F	C	F	F
Approach Delay (s)			161.5			155.3			164.7			168.7
Approach LOS			F			F			F			F

Intersection Summary			
HCM 2000 Control Delay	163.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	115
Future Volume (vph)	115
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1533
Flt Permitted	1.00
Satd. Flow (perm)	1533
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	128
RTOR Reduction (vph)	57
Lane Group Flow (vph)	72
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	52.2
Effective Green, g (s)	52.2
Actuated g/C Ratio	0.44
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	666
v/s Ratio Prot	
v/s Ratio Perm	0.05
v/c Ratio	0.11
Uniform Delay, d1	20.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	20.2
Level of Service	C
Approach Delay (s)	
Approach LOS	

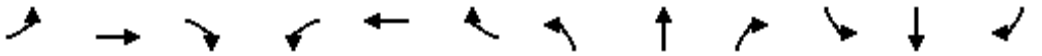
Intersection Summary



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	20	1390	140	45	1190
Future Volume (Veh/h)	35	20	1390	140	45	1190
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	22	1544	156	50	1322
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3046	1625			1702	
vC1, stage 1 conf vol	1624					
vC2, stage 2 conf vol	1422					
vCu, unblocked vol	3046	1625			1702	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	82			86	
cM capacity (veh/h)	122	125			368	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	61	1700	1372
Volume Left	39	0	50
Volume Right	22	156	0
cSH	123	1700	368
Volume to Capacity	0.50	1.00	0.14
Queue Length 95th (ft)	57	0	12
Control Delay (s)	60.0	0.0	10.2
Lane LOS	F		B
Approach Delay (s)	60.0	0.0	10.2
Approach LOS	F		

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	109.4%	ICU Level of Service	H
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	175	815	300	110	115	795	1070	325	70	825	330
Future Volume (vph)	345	175	815	300	110	115	795	1070	325	70	825	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827	1543	3367	1827	1553	3367	3471	1553	1736	3471	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	1827	1543	3367	1827	1553	3367	3471	1553	1736	3471	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	383	194	906	333	122	128	883	1189	361	78	917	367
RTOR Reduction (vph)	0	0	22	0	0	107	0	0	135	0	0	133
Lane Group Flow (vph)	383	194	884	333	122	21	883	1189	226	78	917	234
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.0	21.5	57.4	14.5	21.0	21.0	35.9	65.4	65.4	9.3	38.8	38.8
Effective Green, g (s)	15.0	21.5	57.4	14.5	21.0	21.0	35.9	65.4	65.4	9.3	38.8	38.8
Actuated g/C Ratio	0.12	0.17	0.45	0.11	0.16	0.16	0.28	0.51	0.51	0.07	0.30	0.30
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	395	307	693	382	300	255	946	1777	795	126	1054	471
v/s Ratio Prot	c0.11	0.11	c0.36	0.10	0.07		0.26	0.34		0.04	c0.26	
v/s Ratio Perm			0.21			0.01			0.15			0.15
v/c Ratio	0.97	0.63	1.28	0.87	0.41	0.08	0.93	0.67	0.28	0.62	0.87	0.50
Uniform Delay, d1	56.1	49.4	35.2	55.7	47.8	45.2	44.7	23.1	17.8	57.5	42.1	36.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.8	4.2	135.1	19.1	0.9	0.1	15.6	2.0	0.9	8.7	9.8	3.7
Delay (s)	93.0	53.6	170.2	74.8	48.7	45.3	60.3	25.1	18.7	66.2	51.9	40.2
Level of Service	F	D	F	E	D	D	E	C	B	E	D	D
Approach Delay (s)		135.0			62.8			36.9			49.5	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	67.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	127.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	70	260	55	95	645	215	180	545	250	350	495
Future Volume (vph)	5	70	260	55	95	645	215	180	545	250	350	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1687	3278		1687	3226		1687	3374	1483	1687	3374
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1687	3278		1687	3226		1687	3374	1483	1687	3374
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	78	289	61	106	717	239	200	606	278	389	550
RTOR Reduction (vph)	0	0	14	0	0	26	0	0	0	213	0	0
Lane Group Flow (vph)	0	84	336	0	106	930	0	200	606	65	389	550
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		8.7	29.5		12.0	33.2		17.0	27.0	27.0	28.3	38.3
Effective Green, g (s)		8.7	29.5		12.0	33.2		17.0	27.0	27.0	28.3	38.3
Actuated g/C Ratio		0.08	0.26		0.10	0.29		0.15	0.23	0.23	0.25	0.33
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		127	839		175	929		248	790	347	414	1121
v/s Ratio Prot		0.05	0.10		c0.06	c0.29		0.12	c0.18		c0.23	0.16
v/s Ratio Perm										0.04		
v/c Ratio		0.66	0.40		0.61	1.00		0.81	0.77	0.19	0.94	0.49
Uniform Delay, d1		51.8	35.5		49.3	41.0		47.5	41.2	35.3	42.6	30.7
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		12.2	0.3		5.8	29.7		17.2	4.5	0.3	29.0	0.3
Delay (s)		64.0	35.8		55.2	70.7		64.7	45.7	35.6	71.7	31.0
Level of Service		E	D		E	E		E	D	D	E	C
Approach Delay (s)			41.3			69.1			46.6			42.9
Approach LOS			D			E			D			D

Intersection Summary			
HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

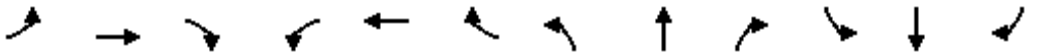
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	365
Future Volume (vph)	365
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1490
Flt Permitted	1.00
Satd. Flow (perm)	1490
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	406
RTOR Reduction (vph)	163
Lane Group Flow (vph)	243
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	38.3
Effective Green, g (s)	38.3
Actuated g/C Ratio	0.33
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	495
v/s Ratio Prot	
v/s Ratio Perm	0.16
v/c Ratio	0.49
Uniform Delay, d1	30.7
Progression Factor	1.00
Incremental Delay, d2	0.8
Delay (s)	31.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	145	50	925	120	25	620
Future Volume (Veh/h)	145	50	925	120	25	620
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	56	1028	133	28	689
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1430	517			1163	
vC1, stage 1 conf vol	1030					
vC2, stage 2 conf vol	400					
vCu, unblocked vol	1430	517			1163	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.3	
p0 queue free %	41	89			95	
cM capacity (veh/h)	271	489			568	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	161	56	514	514	133	28	344	344
Volume Left	161	0	0	0	0	28	0	0
Volume Right	0	56	0	0	133	0	0	0
cSH	271	489	1700	1700	1700	568	1700	1700
Volume to Capacity	0.59	0.11	0.30	0.30	0.08	0.05	0.20	0.20
Queue Length 95th (ft)	88	10	0	0	0	4	0	0
Control Delay (s)	36.1	13.3	0.0	0.0	0.0	11.7	0.0	0.0
Lane LOS	E	B				B		
Approach Delay (s)	30.2		0.0			0.5		
Approach LOS	D							

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	25	285	370	35	70	570	865	335	60	620	85
Future Volume (vph)	110	25	285	370	35	70	570	865	335	60	620	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	0.88
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	1776	1502	3273	1776	1509	3273	3374	1509	3273	3374	2656
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3273	1776	1502	3273	1776	1509	3273	3374	1509	3273	3374	2656
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	28	317	411	39	78	633	961	372	67	689	94
RTOR Reduction (vph)	0	0	36	0	0	67	0	0	179	0	0	58
Lane Group Flow (vph)	122	28	281	411	39	11	633	961	193	67	689	36
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.7	8.1	25.8	13.3	12.7	12.7	17.7	47.2	47.2	5.6	35.1	35.1
Effective Green, g (s)	8.7	8.1	25.8	13.3	12.7	12.7	17.7	47.2	47.2	5.6	35.1	35.1
Actuated g/C Ratio	0.10	0.09	0.28	0.15	0.14	0.14	0.19	0.52	0.52	0.06	0.38	0.38
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	312	157	424	477	247	210	635	1746	780	200	1298	1022
v/s Ratio Prot	0.04	0.02	c0.13	c0.13	0.02		c0.19	c0.28		0.02	0.20	
v/s Ratio Perm			0.06			0.01			0.13			0.01
v/c Ratio	0.39	0.18	0.66	0.86	0.16	0.05	1.00	0.55	0.25	0.34	0.53	0.04
Uniform Delay, d1	38.8	38.5	28.9	38.1	34.5	34.0	36.7	14.8	12.2	41.0	21.7	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.5	3.9	14.7	0.3	0.1	34.7	1.3	0.8	1.0	1.6	0.1
Delay (s)	39.6	39.0	32.7	52.8	34.8	34.1	71.4	16.1	12.9	42.0	23.2	17.6
Level of Service	D	D	C	D	C	C	E	B	B	D	C	B
Approach Delay (s)		34.9			48.7			33.3			24.1	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	270	510	115	325	335	315	185	840	385	340	795
Future Volume (vph)	5	270	510	115	325	335	315	185	840	385	340	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.93		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1736	3367		1736	3176		1736	3471	1525	1736	3471
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1736	3367		1736	3176		1736	3471	1525	1736	3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	300	567	128	361	372	350	206	933	428	378	883
RTOR Reduction (vph)	0	0	16	0	0	142	0	0	0	261	0	0
Lane Group Flow (vph)	0	306	679	0	361	580	0	206	933	167	378	883
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		20.0	23.1		23.5	27.0		17.2	30.4	30.4	24.6	37.8
Effective Green, g (s)		20.0	23.1		23.5	27.0		17.2	30.4	30.4	24.6	37.8
Actuated g/C Ratio		0.17	0.19		0.20	0.22		0.14	0.25	0.25	0.21	0.31
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		289	648		339	714		248	879	386	355	1093
v/s Ratio Prot		0.18	c0.20		c0.21	c0.18		0.12	c0.27		c0.22	0.25
v/s Ratio Perm										0.11		
v/c Ratio		1.06	1.05		1.06	0.81		0.83	1.06	0.43	1.06	0.81
Uniform Delay, d1		50.0	48.5		48.2	44.1		50.0	44.8	37.6	47.7	37.8
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		69.3	48.5		67.1	7.0		20.4	48.0	0.8	66.0	4.5
Delay (s)		119.3	96.9		115.4	51.1		70.4	92.8	38.3	113.7	42.2
Level of Service		F	F		F	D		E	F	D	F	D
Approach Delay (s)			103.7			72.5			75.0			60.5
Approach LOS			F			E			E			E

Intersection Summary			
HCM 2000 Control Delay	76.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

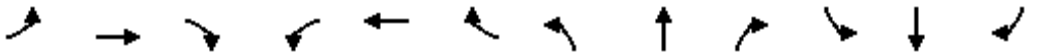
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	115
Future Volume (vph)	115
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1533
Flt Permitted	1.00
Satd. Flow (perm)	1533
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	128
RTOR Reduction (vph)	69
Lane Group Flow (vph)	60
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	37.8
Effective Green, g (s)	37.8
Actuated g/C Ratio	0.31
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	482
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.12
Uniform Delay, d1	29.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	29.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	20	1390	140	45	1190
Future Volume (Veh/h)	35	20	1390	140	45	1190
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	22	1544	156	50	1322
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2307	775			1702	
vC1, stage 1 conf vol	1546					
vC2, stage 2 conf vol	761					
vCu, unblocked vol	2307	775			1702	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	93			86	
cM capacity (veh/h)	141	336			361	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	39	22	772	772	156	50	661	661
Volume Left	39	0	0	0	0	50	0	0
Volume Right	0	22	0	0	156	0	0	0
cSH	141	336	1700	1700	1700	361	1700	1700
Volume to Capacity	0.28	0.07	0.45	0.45	0.09	0.14	0.39	0.39
Queue Length 95th (ft)	26	5	0	0	0	12	0	0
Control Delay (s)	39.9	16.5	0.0	0.0	0.0	16.6	0.0	0.0
Lane LOS	E	C				C		
Approach Delay (s)	31.4		0.0			0.6		
Approach LOS	D							

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	175	815	300	110	115	795	1070	325	70	825	330
Future Volume (vph)	345	175	815	300	110	115	795	1070	325	70	825	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.95	1.00	0.97	0.95	0.88
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827	1543	3367	1827	1553	3367	3471	1553	3367	3471	2733
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	1827	1543	3367	1827	1553	3367	3471	1553	3367	3471	2733
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	383	194	906	333	122	128	883	1189	361	78	917	367
RTOR Reduction (vph)	0	0	22	0	0	87	0	0	133	0	0	188
Lane Group Flow (vph)	383	194	884	333	122	41	883	1189	228	78	917	179
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.0	21.5	57.4	14.5	21.0	21.0	35.9	69.1	69.1	5.6	38.8	38.8
Effective Green, g (s)	15.0	21.5	57.4	14.5	21.0	21.0	35.9	69.1	69.1	5.6	38.8	38.8
Actuated g/C Ratio	0.12	0.17	0.45	0.11	0.16	0.16	0.28	0.54	0.54	0.04	0.30	0.30
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	395	307	693	382	300	255	946	1878	840	147	1054	830
v/s Ratio Prot	c0.11	0.11	c0.36	0.10	0.07		0.26	0.34		0.02	c0.26	
v/s Ratio Perm			0.21			0.03			0.15			0.07
v/c Ratio	0.97	0.63	1.28	0.87	0.41	0.16	0.93	0.63	0.27	0.53	0.87	0.22
Uniform Delay, d1	56.1	49.4	35.2	55.7	47.8	45.8	44.7	20.5	15.8	59.8	42.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.8	4.2	135.1	19.1	0.9	0.3	15.6	1.6	0.8	3.6	9.8	0.6
Delay (s)	93.0	53.6	170.2	74.8	48.7	46.1	60.3	22.1	16.6	63.4	51.9	33.7
Level of Service	F	D	F	E	D	D	E	C	B	E	D	C
Approach Delay (s)		135.0			63.0			35.1			47.6	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	66.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	127.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	70	260	55	95	645	215	180	545	250	350	495
Future Volume (vph)	5	70	260	55	95	645	215	180	545	250	350	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1687	3278		1687	3235		1687	3374	1483	1687	3374
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1687	3278		1687	3235		1687	3374	1483	1687	3374
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	78	289	61	106	717	239	200	606	278	389	550
RTOR Reduction (vph)	0	0	14	0	0	26	0	0	0	213	0	0
Lane Group Flow (vph)	0	84	336	0	106	930	0	200	606	65	389	550
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		8.7	29.5		12.0	33.2		17.0	27.0	27.0	28.3	38.3
Effective Green, g (s)		8.7	29.5		12.0	33.2		17.0	27.0	27.0	28.3	38.3
Actuated g/C Ratio		0.08	0.26		0.10	0.29		0.15	0.23	0.23	0.25	0.33
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		127	839		175	932		248	790	347	414	1121
v/s Ratio Prot		0.05	0.10		c0.06	c0.29		0.12	c0.18		c0.23	0.16
v/s Ratio Perm										0.04		
v/c Ratio		0.66	0.40		0.61	1.00		0.81	0.77	0.19	0.94	0.49
Uniform Delay, d1		51.8	35.5		49.3	41.0		47.5	41.2	35.3	42.6	30.7
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		12.2	0.3		5.8	28.6		17.2	4.5	0.3	29.0	0.3
Delay (s)		64.0	35.8		55.2	69.6		64.7	45.7	35.6	71.7	31.0
Level of Service		E	D		E	E		E	D	D	E	C
Approach Delay (s)			41.3			68.2			46.6			42.9
Approach LOS			D			E			D			D

Intersection Summary			
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	18.4
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

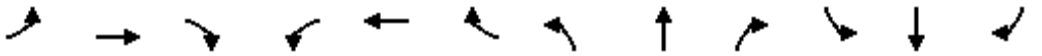
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	365
Future Volume (vph)	365
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1490
Flt Permitted	1.00
Satd. Flow (perm)	1490
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	406
RTOR Reduction (vph)	163
Lane Group Flow (vph)	243
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	38.3
Effective Green, g (s)	38.3
Actuated g/C Ratio	0.33
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	495
v/s Ratio Prot	
v/s Ratio Perm	0.16
v/c Ratio	0.49
Uniform Delay, d1	30.7
Progression Factor	1.00
Incremental Delay, d2	0.8
Delay (s)	31.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	145	50	925	120	25	620
Future Volume (Veh/h)	145	50	925	120	25	620
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	161	56	1028	133	28	689
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1316	346			1163	
vC1, stage 1 conf vol	1030					
vC2, stage 2 conf vol	286					
vCu, unblocked vol	1316	346			1163	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.6	3.4			2.3	
p0 queue free %	42	91			95	
cM capacity (veh/h)	277	634			568	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	161	56	343	343	343	133	28	230	230	230
Volume Left	161	0	0	0	0	0	28	0	0	0
Volume Right	0	56	0	0	0	133	0	0	0	0
cSH	277	634	1700	1700	1700	1700	568	1700	1700	1700
Volume to Capacity	0.58	0.09	0.20	0.20	0.20	0.08	0.05	0.14	0.14	0.14
Queue Length 95th (ft)	84	7	0	0	0	0	4	0	0	0
Control Delay (s)	34.5	11.2	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0
Lane LOS	D	B					B			
Approach Delay (s)	28.5		0.0				0.5			
Approach LOS	D									

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	25	285	370	35	70	570	865	335	60	620	85
Future Volume (vph)	110	25	285	370	35	70	570	865	335	60	620	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	1776	1502	3273	1776	1509	3273	4848	1509	3273	4848	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3273	1776	1502	3273	1776	1509	3273	4848	1509	3273	4848	1509
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	28	317	411	39	78	633	961	372	67	689	94
RTOR Reduction (vph)	0	0	36	0	0	67	0	0	179	0	0	58
Lane Group Flow (vph)	122	28	281	411	39	11	633	961	193	67	689	36
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.7	8.1	25.8	13.3	12.7	12.7	17.7	47.2	47.2	5.6	35.1	35.1
Effective Green, g (s)	8.7	8.1	25.8	13.3	12.7	12.7	17.7	47.2	47.2	5.6	35.1	35.1
Actuated g/C Ratio	0.10	0.09	0.28	0.15	0.14	0.14	0.19	0.52	0.52	0.06	0.38	0.38
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	312	157	424	477	247	210	635	2509	780	200	1865	580
v/s Ratio Prot	0.04	0.02	c0.13	c0.13	0.02		c0.19	c0.20		0.02	0.14	
v/s Ratio Perm			0.06			0.01			0.13			0.02
v/c Ratio	0.39	0.18	0.66	0.86	0.16	0.05	1.00	0.38	0.25	0.34	0.37	0.06
Uniform Delay, d1	38.8	38.5	28.9	38.1	34.5	34.0	36.7	13.2	12.2	41.0	20.1	17.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.5	3.9	14.7	0.3	0.1	34.7	0.4	0.8	1.0	0.6	0.2
Delay (s)	39.6	39.0	32.7	52.8	34.8	34.1	71.4	13.7	12.9	42.0	20.7	17.9
Level of Service	D	D	C	D	C	C	E	B	B	D	C	B
Approach Delay (s)		34.9			48.7			32.1			22.1	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	91.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	270	510	115	325	335	315	185	840	385	340	795
Future Volume (vph)	5	270	510	115	325	335	315	185	840	385	340	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Lane Util. Factor		1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.97		1.00	0.93		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1736	3367		1736	3193		1736	3471	1525	1736	3471
Flt Permitted		0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1736	3367		1736	3193		1736	3471	1525	1736	3471
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	300	567	128	361	372	350	206	933	428	378	883
RTOR Reduction (vph)	0	0	16	0	0	142	0	0	0	285	0	0
Lane Group Flow (vph)	0	306	679	0	361	580	0	206	933	143	378	883
Confl. Peds. (#/hr)		1					1	1		5	5	
Confl. Bikes (#/hr)				1			3					
Turn Type	Prot	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA
Protected Phases	7	7	4		3	8		5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)		20.0	23.1		23.5	27.0		17.2	30.4	30.4	24.6	37.8
Effective Green, g (s)		20.0	23.1		23.5	27.0		17.2	30.4	30.4	24.6	37.8
Actuated g/C Ratio		0.17	0.19		0.20	0.22		0.14	0.25	0.25	0.21	0.31
Clearance Time (s)		4.8	4.8		4.8	4.4		4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		289	648		339	718		248	879	386	355	1093
v/s Ratio Prot		0.18	c0.20		c0.21	c0.18		0.12	c0.27		c0.22	0.25
v/s Ratio Perm										0.09		
v/c Ratio		1.06	1.05		1.06	0.81		0.83	1.06	0.37	1.06	0.81
Uniform Delay, d1		50.0	48.5		48.2	44.0		50.0	44.8	36.9	47.7	37.8
Progression Factor		1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		69.3	48.5		67.1	6.7		20.4	48.0	0.6	66.0	4.5
Delay (s)		119.3	96.9		115.4	50.7		70.4	92.8	37.5	113.7	42.2
Level of Service		F	F		F	D		E	F	D	F	D
Approach Delay (s)			103.7			72.3			74.8			60.5
Approach LOS			F			E			E			E

Intersection Summary			
HCM 2000 Control Delay	76.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

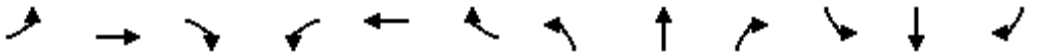
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	115
Future Volume (vph)	115
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.4
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1533
Flt Permitted	1.00
Satd. Flow (perm)	1533
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	128
RTOR Reduction (vph)	69
Lane Group Flow (vph)	60
Confl. Peds. (#/hr)	1
Confl. Bikes (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	37.8
Effective Green, g (s)	37.8
Actuated g/C Ratio	0.31
Clearance Time (s)	4.4
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	482
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.12
Uniform Delay, d1	29.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	29.4
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	20	1390	140	45	1190
Future Volume (Veh/h)	35	20	1390	140	45	1190
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	39	22	1544	156	50	1322
Pedestrians	2					1
Lane Width (ft)	12.0					12.0
Walking Speed (ft/s)	4.0					4.0
Percent Blockage	0					0
Right turn flare (veh)						
Median type			TWLTL			None
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2087	518			1702	
vC1, stage 1 conf vol	1546					
vC2, stage 2 conf vol	541					
vCu, unblocked vol	2087	518			1702	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	96			86	
cM capacity (veh/h)	148	496			361	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	39	22	515	515	515	156	50	441	441	441
Volume Left	39	0	0	0	0	0	50	0	0	0
Volume Right	0	22	0	0	0	156	0	0	0	0
cSH	148	496	1700	1700	1700	1700	361	1700	1700	1700
Volume to Capacity	0.26	0.04	0.30	0.30	0.30	0.09	0.14	0.26	0.26	0.26
Queue Length 95th (ft)	25	3	0	0	0	0	12	0	0	0
Control Delay (s)	37.9	12.6	0.0	0.0	0.0	0.0	16.6	0.0	0.0	0.0
Lane LOS	E	B					C			
Approach Delay (s)	28.8		0.0				0.6			
Approach LOS	D									

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	345	175	815	300	110	115	795	1070	325	70	825	330
Future Volume (vph)	345	175	815	300	110	115	795	1070	325	70	825	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Lane Util. Factor	0.97	1.00	1.00	0.97	1.00	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	1827	1544	3367	1827	1553	3367	4988	1553	3367	4988	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3367	1827	1544	3367	1827	1553	3367	4988	1553	3367	4988	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	383	194	906	333	122	128	883	1189	361	78	917	367
RTOR Reduction (vph)	0	0	21	0	0	99	0	0	173	0	0	271
Lane Group Flow (vph)	383	194	885	333	122	29	883	1189	188	78	917	96
Confl. Peds. (#/hr)			5	5								
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.4	21.5	61.5	15.0	20.1	20.1	40.0	66.1	66.1	7.2	33.3	33.3
Effective Green, g (s)	16.4	21.5	61.5	15.0	20.1	20.1	40.0	66.1	66.1	7.2	33.3	33.3
Actuated g/C Ratio	0.13	0.17	0.49	0.12	0.16	0.16	0.32	0.52	0.52	0.06	0.26	0.26
Clearance Time (s)	4.1	4.1	4.4	4.1	4.1	4.1	4.4	4.4	4.4	4.4	4.4	4.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	435	309	748	398	289	246	1062	2600	809	191	1309	407
v/s Ratio Prot	c0.11	0.11	c0.37	0.10	0.07		0.26	0.24		0.02	c0.18	
v/s Ratio Perm			0.20			0.02			0.12			0.06
v/c Ratio	0.88	0.63	1.18	0.84	0.42	0.12	0.83	0.46	0.23	0.41	0.70	0.24
Uniform Delay, d1	54.2	48.9	32.6	54.7	48.1	45.7	40.3	19.1	16.5	57.7	42.2	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.4	4.0	96.0	14.1	1.0	0.2	5.7	0.6	0.7	1.4	3.1	1.4
Delay (s)	72.6	52.9	128.7	68.8	49.1	46.0	45.9	19.7	17.2	59.2	45.4	38.1
Level of Service	E	D	F	E	D	D	D	B	B	E	D	D
Approach Delay (s)		104.3			59.7			28.8			44.2	
Approach LOS		F			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	54.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	126.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			