FIRSTCARBONSOLUTIONS™

DRAFT
Environmental Impact Report
Merced Gateway Master Plan
City of Merced, Merced County, California

State Clearinghouse Number 2015101048

Prepared for:
City of Merced
678 W. 18th Street
Merced, CA 95340
209.385.6858

Contact: Bill King, Principal Planner

Prepared by:
FirstCarbon Solutions
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
925.357.2562

Contact: Jason Brandman, Project Director
Elizabeth Johnson, Project Manager

Date: July 7, 2016

THIS PAGE INTENTIONALLY LEFT BLANK

Table of Contents

List of Appendices

List of Tables

List of Exhibits

THIS PAGE INTENTIONALLY LEFT BLANK

ACRONYMS AND ABBREVIATIONS

µg/m^3	micrograms per cubic meter
AADT	Annual Average Daily Traffic
AB 52	Assembly Bill 52
ADA	Americans with Disabilities Act
ADT	average daily traffic
APA	Administrative Procedure Act
AQGGP	Air Quality Guidelines for General Plans
AQI	Air Quality Index
ARB	California Air Resources Board
AST	aboveground storage tank
ATCM	Airborne Toxic Control Measures
Bcf	billion cubic feet
BMP	Best Management Practices
BPS	Best Performance Standards
BVOC	biogenic volatile organic compound
C	Celsius
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal OSHA	California Occupational Health and Safety Administration
Cal/EPA	California Environmental Protection Agency
CalEEMod	California Emissions Estimator Model
CalFIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
C-C	Central Commercial District
CCAP	Climate Change Action Plan
CCIC	Central California Information Center
CCR	California Code of Regulations
CCTS	Central California Taxonomic System
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act

CESA	California Endangered Species Act
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH_4	methane
CHL	California Historical Landmarks
CMP	Congestion Management Plan
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	Carbon dioxide
CO_2e	carbon dioxide equivalent
CPHI	California Points of Historical Interest
CPUC	California Public Utilities Code
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dB	decibel
dBA	A-weighted sound level
DOT	United States Department of Transportation
DPM	diesel particulate matter
DPR	Department of Parks and Recreation
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EIR	Environmental Impact Report
EO	Executive Order
EPA	United States Environmental Protection Agency
EPAP	Existing Plus Approved Projects
ESA	Endangered Species Act
F	Fahrenheit
FAR	floor area ratio
FCS	FirstCarbon Solutions
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FGC	California Fish and Game Code
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FMMP	Farmland Mapping and Monitoring Program
FPPA	Federal Farmland Protection Policy Act
FTA	Federal Transit Administration

GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GC	Government Code
GHG Rx	Greenhouse Gas Reduction Exchange
GHG	Greenhouse Gases
GWh/y	gigawatt-hours per year
GWP	global warming potential
HCM	Highway Capacity Manual
HFC	hydrofluorocarbon
HMD	High-Medium Density
HOV/HOT	High Occupancy Vehicle/High Occupancy Toll
HRA	Health Risk Assessment
HRI	California Historic Resources Inventory
HVAC	heating, ventilation, and air conditioning
I	Interstate
ICC	International Code Council
IPCC	Intergovernmental Panel on Climate Change
ISO	Insurance Services Organization
ISR	Indirect Source Review
ITE	Institute of Transportation Engineers
IWMP	Integrated Waste Management Plan
LCFS	Low Carbon Fuel Standard
L_{dn}	day/night average sound level
LE	Land Evaluation
LeA	Landlow Silty Clay Loam
LED	light emitting diode
L_{eq}	equivalent sound level
LESA	Land Evaluation and Site Assessment
LEV	Low-Emission Vehicle
L_{max}	maximum noise level
LOS	Level of Service
MAGPI	Merced Area Groundwater Pool Interests
MBTA	Migratory Bird Treaty Act
MCAG	Merced County Association of Governments
mgd	million gallons per day
MID	Merced Irrigation District
MMI	Modified Mercalli Intensity
MOU	Memorandum of Understanding
mph	miles per hour
$MTCO_2e$	metric tons of CO_2 equivalent

MTS	Merced Transit System
MWh	megawatt-hour
MXD	mixed-use development
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NF_3	nitrogen trifluoride
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOC	Notice of Completion
NOP	Notice of Preparation
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OAL	Office of Administrative Law
OEHHA	California Office of Environmental Health Hazard Assessment
OSHA	Occupational Health and Safety Administration
PCAP	Programmatic Climate Action Plan
PCB	polychlorinated biphenyl
pCi/l	picocuries per liter
PFC	perfluorocarbon
PG&E	Pacific Gas & Electric
Phase I ESA	Phase I Environmental Site Assessment
PHF	Peak Hour Factor
PM_x	particulate matter
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RMP	Risk Management Plan
rms	root mean square
ROG	reactive organic gases
RPS	Renewable Portfolio Standard
RWQCB	Regional Water Quality Control Board

SA	Site Assessment
SARA	Superfund Amendments and Reauthorization Act
SB 18	California Senate Bill 18
SF_6	sulfur hexafluoride
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	sulfur dioxide
SOI	Sphere of Influence
SO_x	Sulfur oxides
SR	State Route
SUDP	Specific Urban Development Plan
SWMP	Storm Water Mitigation Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TCM	transportation control measures
TCR	tribal cultural resources
TDM	Transportation Demand Management
TDS	total dissolved solids
Tg	teragram
therms/y	therms per year
TMA	Transportation Management Association
TMDL	Total Maximum Daily Load
TOD	Transit Oriented Development
TRB	Transportation Research Board
UCMP	University of California Museum of Paleontology
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
UWMP	Urban Water Management Plan
V/C	volume to capacity ratio
VERA	Voluntary Emission Reduction Agreement
VOC	volatile organic compounds
WDR	Waste Discharge Requirements
WnA	Wyman Clay loam
WSA	Water Supply Assessment
WWTF	Wastewater Treatment Facility

THIS PAGE INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

Purpose

This Draft Environmental Impact Report (Draft EIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Merced Gateway Master Plan Project (State Clearinghouse No. 2015101048). This document is prepared in conformance with CEQA (California Public Resources Code, Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.).

The purpose of this Draft EIR is to inform decision makers, representatives of affected and responsible agencies, the public, and other interested parties of the potential environmental effects that may result from implementation of the proposed project. This Draft EIR describes potential impacts relating to a wide variety of environmental issues and methods by which these impacts can be mitigated or avoided.

Project Summary

Project Location

The 77.5-acre project site is located in the City of Merced, Merced County, California. The project site is bounded by two non-continuous segments of S. Coffee Street (west), E. Gerald Avenue (north), undeveloped land (east), and E. Mission Avenue (south).

Project Description

The proposed project consists of (1) General Plan Amendments that would re-configure the boundary between the residential and commercial portions of the project site and amend the General Plan's Circulation Element; (2) corresponding Zone Changes; and (3) the establishment of a Planned Development Zone with an accompanying Master Plan for the site that defines the overall site development concept. The buildout potential of the proposed project is 601,127 square feet of commercial uses, 178 multi-family dwelling units, and a 1.53-acre fire station site. Section 2, Project Description provides a complete description of the project.

Project Objectives

The objectives of the proposed project are to:

- Positively contribute to the local economy through new capital investment, creation of new employment opportunities, expansion of the tax base, and increased retail offerings.
- Reinforce Merced's status as a regional retail node and employment center by increasing commercial offerings.
- Develop regional-serving and highway-oriented commercial uses on a highly visible site near SR-99 in order to cater to local residents and travelers.

- Promote residential and economic growth in accordance with the goals and policies set forth in the Merced Vision 2030 General Plan.
- Develop new multi-family residential uses in southeast Merced to provide additional diverse housing options in a growing part of the City.
- Design a site plan that provides convenient internal circulation, while also minimizing access conflicts between the residential and commercial uses.
- Reserve a site for a future public safety facility in the interests of ensuring that adequate fire protection can be provided in the future.

Significant Unavoidable Adverse Impacts

The proposed project would result in the following significant unavoidable impact:

- **Traffic Impacts:** The project would result in unacceptable operations at up to twelve intersection facilities under Existing Plus Project Conditions, Near-Term conditions, or Cumulative Conditions. Mitigation is proposed; however, it would not fully reduce project impacts to a level of less than significant. Therefore, the residual level of significance at the following intersections would remain significant and unavoidable:
  - Childs Avenue/Parsons Avenue (1)[1] (Near term only)
  - Campus Parkway/Coffee Street (12)
  - Campus Parkway/Central Access (16)
  - Mission Avenue/SR-99 Southbound ramps (10)
  - Mission Avenue/SR-99 Northbound ramps (11)
  - Coffee Street/Project Access central (15)
  - Coffee Street/Project Access south (18)
  - Mission Avenue-Campus Parkway travel speed

Summary of Project Alternatives

Below is a summary of the alternatives to the proposed project considered in Section 5, Alternatives to the proposed project.

No Project Alternative

The project would not be built and the General Plan would not be implemented. No development would take place on the site.

General Plan Circulation Element Alternative

General Plan Circulation Element Build-out Alternative: The Circulation Element Alternative consists of building the proposed Merced Gateway Master Plan with the same uses and square footage, but

[1] The numbers in parentheses correspond to those used to identify the intersections in Section 3.11, Transportation and in Exhibit 3.11-1.

incorporating the roadway improvements envisioned in the Merced General Plan for access to the project site instead of those proposed under the project.

Less Intense Plan Alternative

This alternative would reduce the commercial use on the site by 25 percent, or 150,281 square feet (from 601,127 square feet to 450,846 square feet), and would reduce the number of multi-family housing units from 178 to 134. The 150,281 square feet removed from commercial development and the undeveloped land in the residential parcel would be maintained as open space and public areas throughout the project site.

Areas of Controversy

Pursuant to CEQA Guidelines Section 15123(b), a summary section must address areas of controversy known to the lead agency, including issues raised by agencies and the public, and it must also address issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects.

A Notice of Preparation (NOP) for the proposed project was issued on October 14, 2015. The NOP describing the original concept for the project and issues to be addressed in the EIR was distributed to the State Clearinghouse, responsible agencies, and other interested parties for a public review period extending from October 14, 2015 through November 20, 2015. The NOP identified the potential for significant impacts on the environment related to the following topical areas:

- Aesthetics, Light, and Glare
- Agricultural Resources
- Air Quality & Greenhouse Gas Emissions
- Biological Resources
- Cultural Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Noise
- Public Services and Utilities
- Traffic and Transportation

Disagreement Among Experts

This Draft EIR contains substantial evidence to support all the conclusions presented herein. It is possible that there will be disagreement among various parties regarding these conclusions. Both the CEQA Guidelines and case law clearly provide the standards for treating disagreement among experts. Where evidence and opinions conflict on an issue concerning the environment, and the lead agency knows of these controversies in advance, the EIR must acknowledge the controversies, summarize the conflicting opinions of the experts, and include sufficient information to allow the public and decision makers to make an informed judgment about the environmental consequences of the proposed project.

Potentially Controversial Issues

Below is a list of potentially controversial issues that may be raised during the public review and hearing process of this Draft EIR:

- Air Pollution
- Traffic
- Visual Character
- Land use
- Greenhouse Gas Emissions
- Water Supply

It is also possible that evidence will be presented during the 45-day, statutory Draft EIR public review period that may create disagreement. Decision makers would consider this evidence during the public hearing process.

In rendering a decision on a project where there is disagreement among experts, the decision makers are not obligated to select the most environmentally preferable viewpoint. Decision makers are vested with the ability to choose whatever viewpoint is preferable and need not resolve a dispute among experts. In their proceedings, decision makers must consider comments received concerning the adequacy of the Draft EIR and address any objections raised in these comments. However, decision makers are not obligated to follow any directives, recommendations, or suggestions presented in comments on the Draft EIR, and can certify the Final EIR without needing to resolve disagreements among experts.

Public Review of the Draft EIR

Upon completion of the Draft EIR, the City of Merced filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft EIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the Draft EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR, including the technical appendices, is available for review at the City of Merced offices and the Merced County Library, Main Branch. The address for each location is provided below.

City of Merced
Planning Department
678 W. 18th Street
Merced, CA 95340
Hours:
Monday–Friday:
10 a.m.-12 p.m.; 1 p.m.–5 p.m.

Merced County Library
Main Branch
2100 O Street
Merced, CA 95340
Hours:
Monday–Thursday: 10 a.m.–6 p.m.
Friday and Saturday: 10 a.m.-5 p.m.

Agencies, organizations, and interested parties have the opportunity to comment on the Draft EIR during the 45-day public review period. Written comments on this Draft EIR should be addressed to:

Mr. Bill King, Principal Planner
City of Merced
Planning Department
678 W. 18th Street
Merced, CA 95340
Phone: 209.385.6858
Fax: 209.725.8775
Email: kingB@cityofmerced.org

Submittal of electronic comments in Microsoft Word or Adobe PDF format is encouraged. Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review by the commenting agencies at least 10 days prior to the public hearing before the City of Merced on the project, at which the certification of the Final EIR will be considered. Comments received and the responses to comments will be included as part of the record for consideration by decision makers for the project.

Executive Summary Matrix

Table ES-1 below summarizes the impacts, mitigation measures, and resulting level of significance after mitigation for the relevant environmental issue areas evaluated for the proposed project. The table is intended to provide an overview; narrative discussions for the issue areas are included in the corresponding section of this EIR. Table ES-1 is included in the EIR as required by CEQA Guidelines Section 15123(b)(1).

THIS PAGE INTENTIONALLY LEFT BLANK

Table ES-1: Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 3.1—Aesthetics, Light, and Glare		
Impact AES-1: The project would not have a substantial adverse effect on a scenic vista.	No mitigation is necessary.	Less than significant impact.
Impact AES-2: The project would not substantially damage scenic resources within a scenic corridor.	No mitigation is necessary.	Less than significant impact.
Impact AES-3: The project would not substantially degrade the existing visual character or quality of the site and its surroundings.	No mitigation is necessary.	Less than significant impact.
Impact AES-4: The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	No mitigation is necessary.	Less than significant impact.
Section 3.2–Agricultural Resources		
Impact AG-1: The project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.	No mitigation is necessary.	Less than significant impact.
Impact AG-2: The project would not conflict with existing zoning for agricultural use, or a Williamson Act contract.	No mitigation is necessary.	Less than significant impact.
Impact AG-3: The project would not result in other changes in the existing environment, which, due to their location or nature, could result in the conversion of Farmland, to non-agricultural use.	No mitigation is necessary.	Less than significant impact.
Section 3.3—Air Quality/Greenhouse Gas Emissions		
Impact AIR-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	Implement Mitigation Measures AIR-2a through AIR-2e.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Impact AIR-2: The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.	**MM AIR-2a:** Prior to issuance of the certificate of occupancy for any proposed non-residential commercial use that consists of 30,000 square feet or more building space, the operator shall demonstrate to the satisfaction of the City of Merced that a Transportation Demand Management (TDM) Program will be implemented during operations. The TDM program shall have the following elements: a) Secure bicycle parking for employees. b) Employee lockers and breakroom. c) Rideshare information bulletin board. d) Incentives for employee rideshare, transit use, or bicycling/walking to work. e) Include TDM program information in employee orientation documents and periodic company newsletters. **MM AIR-2b:** Prior to issuance of the certificate of occupancy of any proposed non-residential commercial use that consists of 20,000 square feet or more building space, the City of Merced shall verify that at least one electrical vehicle charging station is provided on the project site for each proposed commercial use that meet the above criteria in order to encourage the use of zero emission vehicles in accordance with California Green Building Code standards. Based on the proposed site plan, this would result in the installation of a minimum of nine (9) electrical vehicle charging stations on the project site. **MM AIR-2c:** Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that all feasible measures detailed in Mitigation Measure 3.3-2 from the Merced Vision 2030 General Plan (provided in Appendix J) have been incorporated into the project design. **MM AIR-2d:** Prior to city approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that an Indirect Source Review (ISR) application has been approved by SJVAPCD.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	MM AIR-2e: The project proponent shall submit evidence, verified by SJVAPCD, that demonstrates that the project's operational-related ROG emissions will be reduced to below SJVAPCD's numeric threshold of 10 tons per year, respectively. These reductions can be achieved by any combination of project design and/or via the project proponent entering into a development mitigation contract (e.g., Voluntary Emission Reduction Agreement, or VERA), with the SJVAPCD. If a VERA is utilized, a copy of the executed agreement and implementing reports will be provided to the City to demonstrate compliance. Additionally, the project proponent shall supply updated documents if the requirements change as the VERA is reassessed by SJVAPCD at each phase of project development. This requirement will be enforced and verified by SJVAPCD. The current VERA payment fee for operational emissions is $94,000 per ton of NOx (The SJVAPCD would likely substitute NOx emissions for ROG emission reductions); payment fees vary by year (i.e., future year payment fees for NOx could be more than the current price of $94,000) and are sensitive to the number of projects requiring emission reductions within the air basin. The VERA shall identify the amount of emissions to be reduced, in addition to the amount of funds to be paid to the SJVAPCD by the project proponent to implement emission reduction projects required for the project. **MM AIR-2f:** During the site preparation and grading of Phases 1 and 4, the project applicant shall require that either at least half of the construction equipment utilized during site preparation and grading activities for Phases 1 and 4 meet Tier 4 emissions standards, or the project applicant shall restrict the simultaneous site preparation and grading activities for Phases 1 and 4.	
Impact AIR-3: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).	Implement Mitigation Measures AIR-2a through AIR-2e.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Impact AIR-4: The project would not expose sensitive receptors to substantial pollutant concentrations.	No mitigation is necessary.	Less than significant impact.
Impact AIR-5: The projects would not create objectionable odors affecting a substantial number of people.	No mitigation is necessary.	Less than significant impact.
Impact AIR-6: The project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment.	Implement Mitigation Measures AIR-2a and AIR-2b.	Less than significant impact.
Impact AIR-7: The project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	**MM AIR-7a:** Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that the on-site roadways of the commercial portion of the project site have been designed for the public to bike across. **MM AIR-7b:** Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that the project has been designed to encourage a safe and convenient pedestrian environment. **MM AIR-7c:** Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that a protected multi-use crossing will be installed at the intersection of Daffodil Drive and Gerard Avenue. **MM AIR-7d:** Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that dedicated water meters will be installed for landscape irrigation.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 3.4—Biological Resources		
Impact BIO-1: The project could have an adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	**MM BIO-1a:** Prior to the first ground-disturbing activities, a qualified biologist shall conduct protocol-level surveys during the breeding season (one site visit between February 15 and April 15 and three between April 15 and July 15, one of which shall be conducted after June 15), at least three weeks apart, in accordance with the 2012 California Department of Fish and Wildlife Staff Report on Burrowing Owl Mitigation (2012 Staff Report). The survey shall include an approximately 500-foot (150-meter) buffer around the project site, where access is permitted. If the surveys are negative, then a letter report shall be prepared documenting the methodology and results within two weeks following the final survey. If the surveys result in negative findings, the project proponent shall conduct a take avoidance survey between 14 days and 30 days prior to commencement of construction, in accordance with the 2012 Staff Report. If burrows are observed within 500 feet of the project site, an impact assessment shall be prepared and submitted to the California Department of Fish and Wildlife (CDFW), in accordance with the 2012 Staff Report. If it is determined that project activities may result in impacts to nesting, occupied, and satellite burrows and/or burrowing owl habitat, the project proponent shall consult with CDFW and develop a detailed mitigation plan such that the habitat acreage, number of burrows, and burrowing owls impacted are replaced. **MM BIO-1b:** Preconstruction/pre-activity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, assess the potential impacts to kit fox by the proposed activity. The status of all dens shall be determined and mapped according to United States Fish and Wildlife Service (USFWS) survey protocol. Written results of preconstruction/ pre-activity surveys must be received by USFWS within 5 days after survey completion and prior to the start of ground disturbance and/or construction activities.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	If a natal/pupping den is discovered within the project area or within 200 feet of the project boundary, USFWS shall be immediately notified and under no circumstances shall the den be disturbed or destroyed without prior authorization. Further coordination with USFWS will be necessary to obtain the necessary take authorization/permit. **MM BIO-1c:** A pre-construction survey for nesting raptors shall be performed in accordance with the survey methodology for Swainson's hawk, prior to any ground disturbance, regardless of when construction will occur. If ground-disturbing project activities occur during the normal avian breeding season (February 1 through September 15), additional pre-construction surveys for active raptor nests shall be conducted no more than 10 days prior to the start of construction. In an active Swainson's hawk nest is detected within 0.5 mile of the project site and work will occur within the avian nesting season, consultation with CDFW will be necessary to determine if take of Swainson's hawk can be avoided. If take cannot be avoided, further consultation with CDFW will be necessary to acquire an Incidental Take Permit pursuant to California Fish and Game Code Section 2081(b) to comply with CESA. **MM BIO-1d:** To avoid any potential impact to nesting birds and other protected species, including those protected by the Migratory Bird Treaty Act, construction of the project shall occur outside of the breeding season (February 1 through September 15). As long as trees, shrubs, and herbaceous vegetation with the potential to support nesting birds is removed between September 16 and January 31 (outside of the nesting season) and does not become re-established within the project, then no further actions are required. If the nesting season (February 1 to September 15) cannot be avoided during construction or vegetation is allowed to reestablish itself within the project, Mitigation Measure BIO-1e shall be required.	

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	MM BIO-1e: If construction activities must occur during the nesting season (February 1 to September 15), a qualified biologist shall conduct a nesting bird survey within three days prior to any disturbance of the site, including disking, demolition activities, and grading. The survey area shall include the project site and a 250-foot buffer around the site. Any active nests identified shall have a buffer area established within a 100-foot radius (200-foot radius for birds of prey) of the active nest. Construction activities shall not occur within the buffer area until the biologist determines that the young have fledged.	
Impact BIO-2: The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.	**MM BIO-2:** To avoid any potential impact to riparian habitat or other sensitive natural community identified, formal jurisdictional delineation surveys shall be performed in the canal area prior to the issuance of grading permits in accordance with survey guidelines set by the United States Army Corps of Engineers (USACE) and CDFW. If jurisdictional wetlands, waters, or riparian habitat are found to be present within the project, consultation with USACE, CDFW, and/or Regional Water Quality Control Board (RWQCB) will be required to determine if avoidance is feasible. If avoidance is not feasible and impacts to jurisdictional wetlands, waters, or riparian habitat may occur, the project shall mitigate unavoidable adverse impacts to waters of the United States, wetlands and riparian habitats (pursuant to the Federal Clean Water Act and the California Fish and Game Code, Section 1600, et seq.) by replacement on an in-kind basis. Furthermore, replacement shall be based on a ratio determined by the CDFW and/or USACE in order to account for the potentially diminished habitat values of replacement habitat. Such replacement should occur on the original development site, whenever possible. Alternatively, replacement can be effected, subject to state and federal regulatory approval, by creation or restoration of replacement habitats elsewhere (off-site but preferably within the County), protected in perpetuity by provision for an appropriate conservation easement or dedication.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Impact BIO-3: The project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	Implement Mitigation Measure BIO-2.	Less than significant impact.
Impact BIO-4: The project would not 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 wildlife nursery sites.	No mitigation is necessary.	Less than significant impact.
Impact BIO-5: The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.	No mitigation is necessary.	Less than significant impact.
Section 3.5—Cultural Resources		
Impact CUL-1: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered historic resources.	**MM CUL-1:** In the event that buried historic or archaeological resources are discovered during construction, operations shall stop within 50 feet of the find and a qualified archaeologist shall be consulted to evaluate the resource in accordance with CEQA Guidelines 15064.5. The applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. If the resource does not qualify as a significant resource, then no further protection or study is necessary. If the resource does qualify as a significant resource then the impacts shall be avoided by project activities. If the resource cannot be avoided, adverse impacts to the resource shall be addressed. The archaeologist shall make recommendations concerning appropriate mitigation measures that shall be implemented to protect the resources, including but not limited to excavation and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. Any previously	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	undiscovered resources found during construction within the project area should be recorded on appropriate Department of Parks and Recreation (DPR) 523 forms and evaluated for significance in terms of CEQA criteria.	
Impact CUL-2: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered archaeological resources.	Implement Mitigation Measure CUL-1.	Less than significant impact.
Impact CUL-3: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered paleontological resources.	**MM CUL-3:** In the event that fossils or fossil-bearing deposits are discovered during construction activities, excavations within a 50-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to resume at the location of the find. If the Applicant determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The plan shall be submitted to the City of Merced for review and approval prior to implementation, and the Applicant shall adhere to the recommendations in the plan.	Less than significant impact.
Impact CUL-4: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered human burial sites.	**MM CUL-4:** In the event of the accidental discovery or recognition of any human remains, CEQA Guidelines Section 15064.5, Health and Safety Code Section 7050.5, and Public Resources Code (PRC) Sections 5097.94 and 5097.98 must be followed. If during the course of project development there is accidental discovery or recognition of any human remains, the following steps shall be taken: 1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	until the County Coroner is contacted and determines if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours, and 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 landowner or the person responsible for the excavation work within 48 hours, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98. 2. Where the following conditions occur, the landowner or his or her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendant or on the project site in a location not subject to further subsurface disturbance: • The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 48 hours after being notified by the commission. • The descendant identified fails to make a recommendation. • The landowner or his authorized representative rejects the recommendation of the descendant, and mediation by the NAHC fails to provide measures acceptable to the landowner. Additionally, California Public Resources Code Section 15064.5 requires the following with regards to Native American Remains: When an initial study identifies the existence of, or the probable likelihood of, Native American Remains within a project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop a plan for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American Burials with the appropriate Native Americans as identified by the NAHC.	

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 3.6—Hazards and Hazardous Materials		
Impact HAZ-1: The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	No mitigation is necessary.	Less than significant impact.
Impact HAZ-2: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	No mitigation is necessary.	Less than significant impact.
Impact HAZ-3: The project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	No mitigation is necessary.	Less than significant impact.
Section 3.7—Hydrology and Water Quality		
Impact HYD-1: Construction and operational activities associated with the proposed project have the potential to degrade water quality in downstream water bodies.	**MM HYD-1a:** Prior to the issuance of grading permits, the project applicant shall file a Notice of Intent with and obtain a facility identification number from the State Water Resources Control Board. The project applicant shall also submit a Stormwater Pollution Prevention Plan (SWPPP) to the City of Merced that identifies specific actions and Best Management Practices (BMPs) to prevent stormwater pollution during construction activities. The SWPPP shall identify a practical sequence for BMP implementation, site restoration, contingency measures, responsible parties, and agency contacts. The SWPPP shall include but not be limited to the following elements: • Comply with the requirements of the State of California's most current Construction Stormwater Permit. • Temporary erosion control measures shall be implemented on all disturbed areas. • Disturbed surfaces shall be treated with erosion control measures during the October 15 to April 15 rainy season. • Sediment shall be retained on-site by a system of sediment basins, traps, or other BMPs.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	• The construction contractor shall prepare Standard Operating Procedures for the handling of hazardous materials on the construction site to eliminate discharge of materials to storm drains. • BMP performance and effectiveness shall be determined either by visual means where applicable (e.g., observation of above-normal sediment release), or by actual water sampling in cases where verification of contaminant reduction or elimination (such as inadvertent petroleum release) is required by the Central Valley Regional Water Quality Control Board to determine adequacy of the measure. • In the event of significant construction delays or delays in final landscape installation, native grasses or other appropriate vegetative cover shall be established on the construction site as soon as possible after disturbance, as an interim erosion control measure throughout the wet season. **MM HYD-1b:** Prior to the issuance of building permits, the project applicant shall submit a final Storm Water Mitigation Plan (SWMP) to the City of Merced for review and approval. The plan shall be developed using the California Stormwater Quality Association's "New Development and Redevelopment Handbook." The SWMP shall identify pollution prevention measures and BMPs necessary to control stormwater pollution from operational activities and facilities, and provide for appropriate maintenance over time. The SWMP shall include design concepts that are intended to accomplish a "first flush" objective that would remove contaminants from the first 2 inches of stormwater before it enters area waterways. The project applicant shall also prepare and submit an Operations and Maintenance Agreement to the City identifying procedures to ensure that stormwater quality control measures work properly during operations.	
Impact HYD-2: The proposed project would not contribute to groundwater overdraft or impair groundwater recharge.	No mitigation is necessary.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Impact HYD-3: The proposed project would not contribute runoff to downstream storm drainage facilities that would result in the potential for flooding.	No mitigation is necessary.	Less than significant impact.
Impact HYD-4: The proposed project may locate structures within a 100-year flood hazard area.	**MM HYD-4:** Prior to issuance of grading permits for any building located within a 100-year hazard flood zone, the applicant shall prepare and submit building plans to the City of Merced that demonstrate compliance with federal law and Merced Code of Ordinances Chapter 17.48. The standards include but are not limited to requirements for anchoring, construction materials and methods, elevation, and floodproofing. In addition, the applicant shall provide certification by a registered professional engineer or architect that the activity would not result in an increase in flood levels during the occurrence of the base flood discharge.	Less than significant impact.
Impact HYD-5: The proposed project would not expose people or structures to flooding as a result of levee or dam failure.	No mitigation is necessary.	Less than significant impact.
Section 3.8—Land Use		
Impact LU-1: The project would not physically divide an established community.	No mitigation is necessary.	Less than significant impact.
Impact LU-2: The project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.	No mitigation is necessary.	Less than significant impact.
Impact LU-3: The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan.	No mitigation is necessary.	No impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 3.9—Noise		
Impact NOI-1: Implementation of the project would result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**MM NOI-1:** To reduce potential construction noise impacts, the following multi-part mitigation measure shall be implemented for the project: • The construction contractor shall ensure that all internal combustion engine-driven equipment is equipped with mufflers that are in good condition and appropriate for the equipment. • The construction contractor shall locate stationary noise-generating equipment as far as feasible from sensitive receptors when sensitive receptors adjoin or are near a construction disturbance area. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site. • The construction contractor shall prohibit unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes is prohibited). • The construction contractor shall locate, to the maximum extent practical, on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction. • The construction contractor shall limit all noise producing construction activities, including deliveries and warming up of equipment, to the hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday. No such work shall be permitted on Sundays or federal holidays without prior approval from the City. **MM NOI-2:** To reduce potential traffic noise impacts, the following multi-part mitigation measure shall be implemented for the project: • The project shall incorporate a minimum 8-foot-high soundwall along the Gerard Avenue bordering the proposed residential land use portion of the project. The soundwall shall wrap around the west end of the residential portion of the project, along Coffee Street, for a minimum of 50 feet. In addition, the soundwall should wrap around the eastern end of the residential portion of the project, along the project entrance south of Daffodil Street, for a minimum distance of 50 feet. The	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	building plans approved by the City shall reflect this requirement. • All proposed residential units with a direct line of sight to Gerard Avenue would require an alternative ventilation system, such as air conditioning, to ensure that windows can remain closed for a prolonged period of time. The building plans approved by the City shall reflect this requirement. • The proposed hotel land use located on the southern parcel of the project site shall include an alternate form of ventilation, such as an air conditioning system, in order to ensure that windows can remain closed for a prolonged period of time. The building plans approved by the City shall reflect this requirement.	
Impact NOI-2: The project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels.	No mitigation is necessary.	Less than significant impact.
Impact NOI-3: The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	No mitigation is necessary.	Less than significant impact.
Impact NOI-4: The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	Implement Mitigation Measure NOI-1.	Less than significant impact.
Section 3.10—Public Services and Utilities		
Impact PSU-1: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded fire facilities or adverse impacts on fire protection.	No mitigation is necessary.	Less than significant impact.
Impact PSU-2: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded police facilities that result in	No mitigation is necessary.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
physical impacts on the environment, insufficient response time, or overall police protection.		
Impact PSU-3: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded potable water facilities that result in physical impacts on the environment.	No mitigation is necessary.	Less than significant impact.
Impact PSU-4: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded recycled water facilities that result in physical impacts on the environment.	No mitigation is necessary.	Less than significant impact.
Impact PSU-5: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded wastewater facilities that result in physical impacts on the environment.	No mitigation is necessary.	Less than significant impact.
Impact PSU-6: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded storm drainage facilities that result in physical impacts on the environment.	No mitigation is necessary.	Less than significant impact.
Impact PSU-7: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded solid waste facilities that result in physical impacts on the environment.	No mitigation is necessary.	Less than significant impact.
Impact PSU-8: Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded energy facilities that result in physical impacts on the environment.	No mitigation is necessary.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Section 3.11—Transportation		
Impact TRANS-1: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing Plus Project Conditions.	**MM TRANS-1a:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Gerard Avenue/Coffee Street (3) with an enhanced pedestrian crossing. **MM TRANS-1b:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the segment of Coffee Road from Parsons Avenue to Campus parkway to a four-lane roadway. The improved roadway shall be designed and constructed in accordance with City of Merced engineering standards. **MM TRANS-1c:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Coffee Street/Parsons Avenue (9). The intersection shall be improved with a traffic signal. **MM TRANS-1d:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Mission Avenue/Southbound SR-99 Ramps (10). The intersection shall be improved with a second southbound left turn lane by reconfiguring the existing right turn lane to become a left-turn/right-turn lane. **MM TRANS-1e:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Mission Avenue/Northbound SR-99 Ramps (11). The intersection shall be improved by adding a third eastbound through lane and converting the northbound right turn lane and westbound right turn lane to "free" right turn lanes. **MM TRANS-1f:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Campus Parkway/Coffee Street (12). The intersection shall be improved with a signal, a third eastbound through lane, a second eastbound left turn lane and westbound left turn lane, a third westbound	Significant unavoidable impact: Campus Parkway/Coffee Street (12), Campus Parkway/Central Access (16), Coffee Street/South Access (18). Less than significant impact: Coffee Street between Parsons Avenue and Campus Parkway (segment), Coffee Street/Parsons Avenue (9), Mission Ave/SB SR-99 ramps (10), Mission Ave/NB SR-99 ramps (11), and Mission Avenue/Central access (19).

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
	through lane, a westbound right turn lane, a second northbound left turn lane, and separate southbound left turn and through lanes, with overlap phase on southbound right turn. Coffee Street shall be widened north and south of Campus Parkway to provide two receiving lanes for left turns from Campus Parkway. **MM TRANS-1g:** A transportation improvement phasing plan shall be prepared by the City of Merced as a part of the Merced Gateway Planned Development Master Plan. The transportation improvement phasing plan shall specify, based on vehicle trip generation volumes or other accepted metric, when intersection, road segment, alternative transportation improvements, or other transportation improvements shall be implemented in order to ensure acceptable levels of service at each affected intersection or roadway segment. The plan will also indicate the costs, fair-share or otherwise, of the improvement to be borne by the applicant.	
Impact TRANS-2: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing Plus Approved Projects Plus Project Conditions.	Implement Mitigation Measures TRANS-1a, TRANS-1b, TRANS-1c, TRANS-1d, TRANS-1e, TRANS-1f, TRANS-1g, and: **MM TRANS-2:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Mission Avenue/Southbound SR-99 Ramps (10) with a third eastbound through lane and converting the westbound right turn lane to a "free" right turn, and the segment of Mission Avenue between the ramps and Coffee shall be widened to 6 lanes total. The applicant shall be responsible for its proportional cost of the improvement.	Significant unavoidable impact: Childs Avenue/Parsons Avenue (1), Campus Parkway/Coffee Street (12), Mission Ave/SB SR-99 ramps (10), Mission Ave/NB SR-99 ramps (11), Coffee Street/Central Access (15), and Coffee Street/South Access (18). Less than significant impact: Coffee Street/Parsons Avenue (9), Campus Parkway/Central access (16), and Campus Parkway/Pluim Drive (17).

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Impact TRANS-3: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Cumulative Conditions.	Implement Mitigation Measures TRANS-1a, TRANS-1b, TRANS-1c, TRANS-1d, TRANS-1e, TRANS-1f, TRANS-1g, TRANS-2, and: **MM TRANS-3a:** Prior to issuance of building permits for the proposed project, the project applicant shall pay impact fees to the City of Merced for improvements to the intersection of Childs Avenue/Parsons Avenue (1). The improvements shall consist of reconfiguring the eastbound through lane to a shared through/left-turn lane. The City of Merced shall install the improvements when monitoring determines that the intersection is approaching unacceptable levels. **MM TRANS-3b:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, widen Coffee Street between Campus Parkway and Mission Avenue to four lanes.	Significant unavoidable impact: Campus Parkway/Coffee Street (12), Mission Ave/SB SR-99 ramps (10), Mission Ave/NB SR-99 ramps (11), Campus Parkway/Central Access (16), Coffee Street/Central access (15), and Coffee Street/South Access (18). Less than significant impact: Childs Avenue/Parsons Avenue (1), Gerard Avenue/Campus Parkway (5), Coffee Street/Parsons Avenue (9), and Campus Parkway/Pluim Drive (17).
Impact TRANS-4: The project may conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.	Implement Mitigation Measures AIR-7b, TRANS-1d, TRANS-1e, TRANS-1f, TRANS-1g, and TRANS-2.	Significant unavoidable impact: Mission Ave/SB SR-99 ramps, Mission Ave/NB SR-99 ramps, Campus Parkway/Coffee Street intersection (12), and travel speed on Mission Avenue/Campus Parkway.
Impact TRANS-5: The project may substantially increase hazards due to a design feature or incompatible uses.	**MM TRANS-5:** In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the applicant shall retain a qualified engineer to design the Parsons Avenue extension between Coffee Street and the eastern boundary of the project to be capable of handling commercial trucks. The roadway improvement plans shall be submitted to the City of Merced for review and approval. The Parsons Avenue extension shall be completed by the time of issuance of the first certificate of occupancy for the North commercial area.	Less than significant impact.
Impact TRANS-6: The project would not result in inadequate emergency access.	No mitigation is necessary.	Less than significant impact.

Table ES-1 (cont.): Executive Summary Matrix

Impacts	Mitigation Measures	Level of Significance After Mitigation
Impact TRANS-7: The project may conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.	Implement Mitigation Measure TRANS-1a.	Less than significant impact.

SECTION 1: INTRODUCTION

1.1 - Overview of the CEQA Process

This Draft Environmental Impact Report (Draft EIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Merced Gateway Master Plan (State Clearinghouse No. 2015101048). This document is prepared in conformance with CEQA (California Public Resources Code, Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.). This Draft EIR is intended to serve as an informational document for the public agency decision makers and the public regarding the proposed project.

1.1.1 - Overview

The proposed project consists of (1) General Plan Amendments that would re-configure the boundary between the residential and commercial portions of the project site and amend the General Plan's Circulation Element; (2) corresponding Zone Changes; and (3) the establishment of a Planned Development Zone with an accompanying Master Plan for the site that defines the overall site development concept. The buildout potential of the proposed project is 601,127 square feet of commercial uses, 178 multi-family dwelling units, and a 1.53-acre fire station site. Section 2, Project Description provides a complete description of the project.

1.1.2 - Purpose and Authority

This Draft EIR provides a project-level analysis of the environmental effects of the Merced Gateway Master Plan. The environmental impacts of the proposed project are analyzed in the EIR to the degree of specificity appropriate, in accordance with CEQA Guidelines Section 15146. This document addresses the potentially significant adverse environmental impacts that may be associated with the planning, construction, or operation of the project. It also identifies appropriate and feasible mitigation measures and alternatives that may be adopted to significantly reduce or avoid these impacts.

CEQA requires that an EIR contain, at a minimum, certain specific elements. These elements are contained in this Draft EIR and include:

- Table of Contents
- Introduction
- Executive Summary
- Project Description
- Environmental Setting, Significant Environmental Impacts, and Mitigation Measures
- Cumulative Impacts
- Significant Unavoidable Adverse Impacts
- Alternatives to the Proposed Project
- Growth-Inducing Impacts
- Effects Found not to be Significant
- Areas of Known Controversy

1.1.3 - Lead Agency Determination

The City of Merced is designated as the lead agency for the project. CEQA Guidelines Section 15367 defines the lead agency as ". . . the public agency, which has the principal responsibility for carrying out or approving a project." Other public agencies may use this Draft EIR in the decision-making or permit process and consider the information in this Draft EIR along with other information that may be presented during the CEQA process.

This Draft EIR was prepared by FirstCarbon Solutions, an environmental consultant. Prior to public review, it was extensively reviewed and evaluated by the City of Merced. This Draft EIR reflects the independent judgment and analysis of the City of Merced as required by CEQA. Lists of organizations and persons consulted and the report preparation personnel are provided in Section 8 this Draft EIR.

1.2 - Scope of the EIR

This Draft EIR addresses the potential environmental effects of the proposed project. The City of Merced issued a Notice of Preparation (NOP) for the proposed project on October 14, 2015, which circulated between October 14, 2015 and November 20, 2015, for the statutory 30-day minimum public review period. The scope of this Draft EIR includes the potential environmental impacts identified in the NOP and issues raised by agencies and the public in response to the NOP. The NOP is contained in Appendix A of this Draft EIR.

Four comment letters were received in response to the NOP. They are listed in Table 1-1 and provided in Appendix A of this Draft EIR.

Table 1-1: IS-NOP Comment Letters

Affiliation	Signatory	Date	Summary of Relevant Comments
San Joaquin Valley Air Pollution Control District	Arnaud Marjollet, Director of Permit Services	November 19, 2015	Land use planning to reduce vehicle miles traveled; Analysis of construction/operational emissions or criteria pollutants, Nuisance Odors, and mitigation; Health impacts from TACs, District rules and regulations
California Department of Fish and Wildlife	Julie A. Vance, Regional Manager	November 16, 2015	Possible takings of Swainson's Hawk and Burrowing Owls
Caltrans District 10	Tom Dumas, Chief Office of Metropolitan Planning	October 28, 2015	Traffic impact study required to determine effects upon SR 99 on- and off-ramps
Wagner Jones Helsley PC	Cameron M. Peyton	November 20, 2015	Traffic circulation impacts
Source: City of Merced, 2015.			

1.2.1 - Scoping Meeting

Pursuant to CEQA Guidelines Section 15082(c)(1), the City of Merced held a public scoping meeting for the proposed project on Tuesday, October 27, 2015, in the Sam Pipes Meeting Room at Merced Civic Center. Comments regarding traffic and building height received at the meeting have been addressed in this Draft EIR.

1.2.2 - Environmental Issues Determined not to be Significant

The NOP identified topical areas that were determined not to be significant. An explanation of why each area is determined not to be significant is provided in Section 7, Effects Found not to be Significant. These topical areas are as follows:

- Geology, Soils, and Seismicity
- Mineral Resources
- Population and Housing
- Recreation

In addition, certain subjects with various topical areas were determined not to be significant. Other potentially significant issues are analyzed in these topical areas; however, the following issues are not analyzed:

- Forest Land
- Risk of Upset
- Exposure of Schools to Hazardous Materials or Emissions
- Hazardous Materials Site
- Emergency Evacuation or Response
- Airport Noise
- Schools
- Libraries and other services

An explanation of why each issue is determined not to be significant is provided in Section 7, Effects Found not to be Significant.

1.2.3 - Potentially Significant Environmental Issues

The NOP found that the following topical areas may contain potentially significant environmental issues that will require further analysis in the EIR. These sections are as follows:

- Aesthetics, Light, and Glare
- Agricultural Resources
- Hydrology and Water Quality
- Land Use
- Air Quality & Greenhouse Gas Emissions
- Noise
- Biological Resources

- Public Services and Utilities
- Cultural Resources
- Hazards and Hazardous Materials Transportation

1.3 - Organization of the EIR

This Draft EIR is organized into the following main sections:

- **Section ES: Executive Summary.** This section includes a summary of the proposed project and alternatives to be addressed in the Draft EIR. A brief description of the areas of controversy and issues to be resolved, and overview of the Mitigation Monitoring and Reporting Program, in addition to a table that summarizes the impacts, mitigation measures, and level of significance after mitigation, are also included in this section.
- **Section 1: Introduction.** This section provides an introduction and overview describing the purpose of this Draft EIR, its scope and components, and its review and certification process.
- **Section 2: Project Description.** This section includes a detailed description of the proposed project, including its location, site, and project characteristics. A discussion of the project objectives, intended uses of the Draft EIR, responsible agencies, and approvals that are needed for the proposed project are also provided.
- **Section 3: Environmental Impact Analysis.** This section analyzes the environmental impacts of the proposed project. Impacts are organized into major topic areas. Each topic area includes a description of the environmental setting, methodology, significance criteria, impacts, mitigation measures, and significance after mitigation. The specific environmental topics that are addressed within Section 3 are as follows:
  - **Section 3.1 – Aesthetics, Light, and Glare:** Addresses the potential visual impacts of development intensification and the overall increase in illumination produced by the project.
  - **Section 3.2 – Agriculture Resources:** Addresses the potential impacts of converting farmland to urban use by implementing the project.
  - **Section 3.3 – Air Quality/Greenhouse Gas Emissions:** Addresses the potential air quality impacts associated with project implementation. In addition, the section also evaluates project emissions of greenhouse gases.
  - **Section 3.4 – Biological Resources:** Addresses the project's potential impacts on habitat, vegetation, and wildlife; the potential degradation or elimination of important habitat; and impacts on listed, proposed, and candidate threatened and endangered species.
  - **Section 3.5 – Cultural Resources:** Addresses potential impacts on historical resources, archaeological resources, paleontological resources, and burial sites.
  - **Section 3.6 – Hazards and Hazardous Materials:** Addresses the potential for the presence of hazardous materials or conditions on the project site and in the project area that may have the potential to impact human health.
  - **Section 3.7 – Hydrology and Water Quality:** Addresses the potential impacts of the project on local hydrological conditions, including drainage areas, and changes in the flow rates.

- **Section 3.8 – Land Use:** Addresses the potential land use impacts associated with division of an established community and consistency with the City of Merced General Plan.
- **Section 3.9 – Noise:** Addresses the potential noise impacts during construction and at project buildout from mobile and stationary sources. The section also addresses the impact of noise generation on neighboring uses.
- **Section 3.10 – Public Services and Utilities:** Addresses the potential impacts upon service providers, including fire protection, law enforcement, water supply, wastewater, solid waste, and energy providers.
- **Section 3.11 – Transportation:** Addresses the impacts on the local and regional roadway system, public transportation, bicycle, and pedestrian access.

- **Section 4: Cumulative Effects.** This section discusses the cumulative impacts associated with the proposed project, including the impacts of past, present, and probable future projects.
- **Section 5: Alternatives to the Proposed Project.** This section compares the impacts of the proposed project with three land-use project alternatives: the No Project Alternative, the Circulation Element Alternative, and the Less Intense Alternative. An environmentally superior alternative is identified. In addition, alternatives initially considered but rejected from further consideration are discussed.
- **Section 6: Other CEQA Considerations.** This section provides a summary of significant environmental impacts, including unavoidable and growth-inducing impacts. This section discusses the cumulative impacts associated with the proposed project, including the impacts of past, present, and probable future projects. In addition, the proposed project's energy demand is discussed.
- **Section 7: Effects Found not to be Significant.** This section contains analysis of the topical sections not addressed in Section 3.
- **Section 8: Persons and Organizations Consulted/List of Preparers.** This section also contains a full list of persons and organizations that were consulted during the preparation of this Draft EIR. This section also contains a full list of the authors who assisted in the preparation of the Draft EIR, by name and affiliation.
- **Section 9: References.** This section contains a full list of references that were used in the preparation of this Draft EIR.
- **Appendices.** This section includes all notices and other procedural documents pertinent to the Draft EIR, as well as all technical material prepared to support the analysis.

1.4 - Documents Incorporated by Reference

As permitted by CEQA Guidelines Section 15150, this Draft EIR has referenced several technical studies, analyses, and previously certified environmental documentation. Information from the documents, which have been incorporated by reference, has been briefly summarized in the appropriate section(s). The relationship between the incorporated part of the referenced document

and the Draft EIR has also been described. The documents and other sources that have been used in the preparation of this Draft EIR include but are not limited to:

- City of Merced General Plan
- Merced Municipal Code
- City of Merced 2010 Urban Water Management Plan

These documents are specifically identified in Section 9, References, of this Draft EIR. In accordance with CEQA Guidelines Section 15150(b), the General Plan, Municipal Code, and the City of Merced 2010 Urban Water Management Plan are available for review at the City of Merced Planning Department at the address shown in Section 1.6 below.

1.5 - Documents Prepared for the Project

The following technical studies and analyses were prepared for the proposed project:

- Land Evaluation and Site Assessment, prepared by FirstCarbon Solutions (Appendix B)
- Air Quality and Greenhouse Gas Emissions Analysis, prepared by Vista Environmental (Analysis wholly contained in Section 3.3, Air Quality/Greenhouse Gas Emissions; supporting information is provided in Appendix C.)
- Biological Resources Analysis, prepared by First Carbon Solutions. (Analysis is wholly contained in Section 3.4, Biological Resources; supporting information is supplied in Appendix D.)
- Cultural Resources Analysis, prepared by FirstCarbon Solutions. (Analysis is wholly contained in Section 3.5, Cultural Resources; supporting information is supplied in Appendix E.)
- Noise Analysis, prepared by FirstCarbon Solutions. (Analysis is wholly contained in Section 3.6, Noise; supporting information is supplied in Appendix F.)
- Water Supply Assessment prepared by Balance Hydrologics (Appendix H)
- Traffic Impact Analysis prepare by K.D. Anderson and Associates (Appendix I)

1.6 - Review of the Draft EIR

Upon completion of the Draft EIR, the City of Merced filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft EIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the Draft EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR, including the technical appendices, is available for review at the City of Merced. The address for each location is provided below:

City of Merced
Planning Department
678 W. 18th Street
Merced, CA 95340
Hours:
Monday–Friday:
10 a.m.-12 p.m.; 1 p.m.–5 p.m.

Merced County Library
Main Branch
2100 O Street
Merced, CA 95340
Hours:
Monday–Thursday: 10 a.m.– 6 p.m.
Friday and Saturday: 10 a.m.-5 p.m.

Agencies, organizations, and interested parties have the opportunity to comment on the Draft EIR during the 45-day public review period. All comments must be in writing. Written comments on this Draft EIR should be addressed to:

Mr. Bill King, Principal Planner
City of Merced
Planning Department
678 W. 18th Street
Merced, CA 95340
Phone: (209) 385-6858
Fax: (209) 725-8775
Email: kingB@cityofmerced.org

Submittal of electronic comments in Microsoft Word or Adobe PDF format is encouraged. Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review by the commenting agencies at least 10 days prior to the public hearing before the Merced City Council on the project, at which the certification of the Final EIR will be considered. Comments received and the responses to comments will be included as part of the record for consideration by decision makers for the project.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 2: PROJECT DESCRIPTION

This Environmental Impact Report (EIR) analyzes the potential environmental effects of the proposed Merced Gateway Master Plan in the City of Merced.

2.1 - Project Location and Setting

2.1.1 - Location

The 77.5-acre project site is located in the City of Merced, Merced County, California (Exhibit 2-1). The project site is bounded by two non-continuous segments of S. Coffee Street (west), E. Gerard Avenue (north), undeveloped land (east), and E. Mission Avenue (south); refer to Exhibit 2-2. The Campus Parkway Expressway bisects the site. The project site is located on the Merced, California, United States Geological Survey 7.5-minute topographic quadrangle map, Township 7 South, Range 14 East, Section 34 (Latitude 37°16'12" North; Longitude 120°25'52" West).

2.1.2 - Existing Conditions

The 77.5-acre project site contains undeveloped land that is regularly disked, and is characterized by weedy vegetation. A barbed wire fence is located around the site perimeter of the project site, and signs advertising the site as available for commercial development face the intersection of Campus Parkway/S. Coffee Street. The elevation of the site is approximately 300 feet above mean sea level. Site photographs are provided in Exhibit 2-3.

Roadways

Campus Parkway, a four-lane divided expressway, bisects the project site in an east-to-west direction. The roadway features a landscaped median, incomplete curb and gutter improvements, and street lighting along the project frontage. A multi-use pathway is located on the north side of the roadway.

East Gerard Avenue forms the northern boundary of the site, and consists of a two-lane undivided roadway with curb, gutter, sidewalk, and street lighting on the north side. The south side is unimproved.

East Mission Avenue forms the southern boundary of the site, and consists of a two-lane undivided roadway with no improvements along either side.

South Coffee Street forms the western boundary of the site, and is divided into two segments that are not connected. The northern segment terminates at a roadblock approximately 100 feet north of Parsons Avenue, along the frontage of Pioneer Elementary School. The southern segment proceeds southward from Parsons Avenue. The street is a two-lane undivided roadway with curb, gutter, sidewalk, and street lighting on the west side. The east side is unimproved.

2.1.3 - Surrounding Land Uses

West

South Coffee Street forms the western boundary of the project site. West of South Coffee Street are Pioneer Elementary School (north of E. Parsons Avenue), two undeveloped parcels designated for "Thoroughfare Commercial" by the Merced Vision 2030 General Plan (north and south of Campus Parkway), and the State Route 99 (SR-99)/Campus Parkway interchange.

North

E. Gerard Avenue forms the northern boundary of the project site. North of E. Gerard Avenue are single-family residential uses designated "Low Density Residential" by the Merced Vision 2030 General Plan.

East

Undeveloped land that was previously used for cultivated agriculture is located east of the project site. This land is designated for "Business Park" use by the Merced Vision 2030 General Plan.

South

E. Mission Avenue forms the southern boundary of the project site. South of E. Mission Avenue is undeveloped land designated "Regional Commercial Reserve" by the Merced Vision 2030 General Plan.

2.1.4 - Land Use Designations

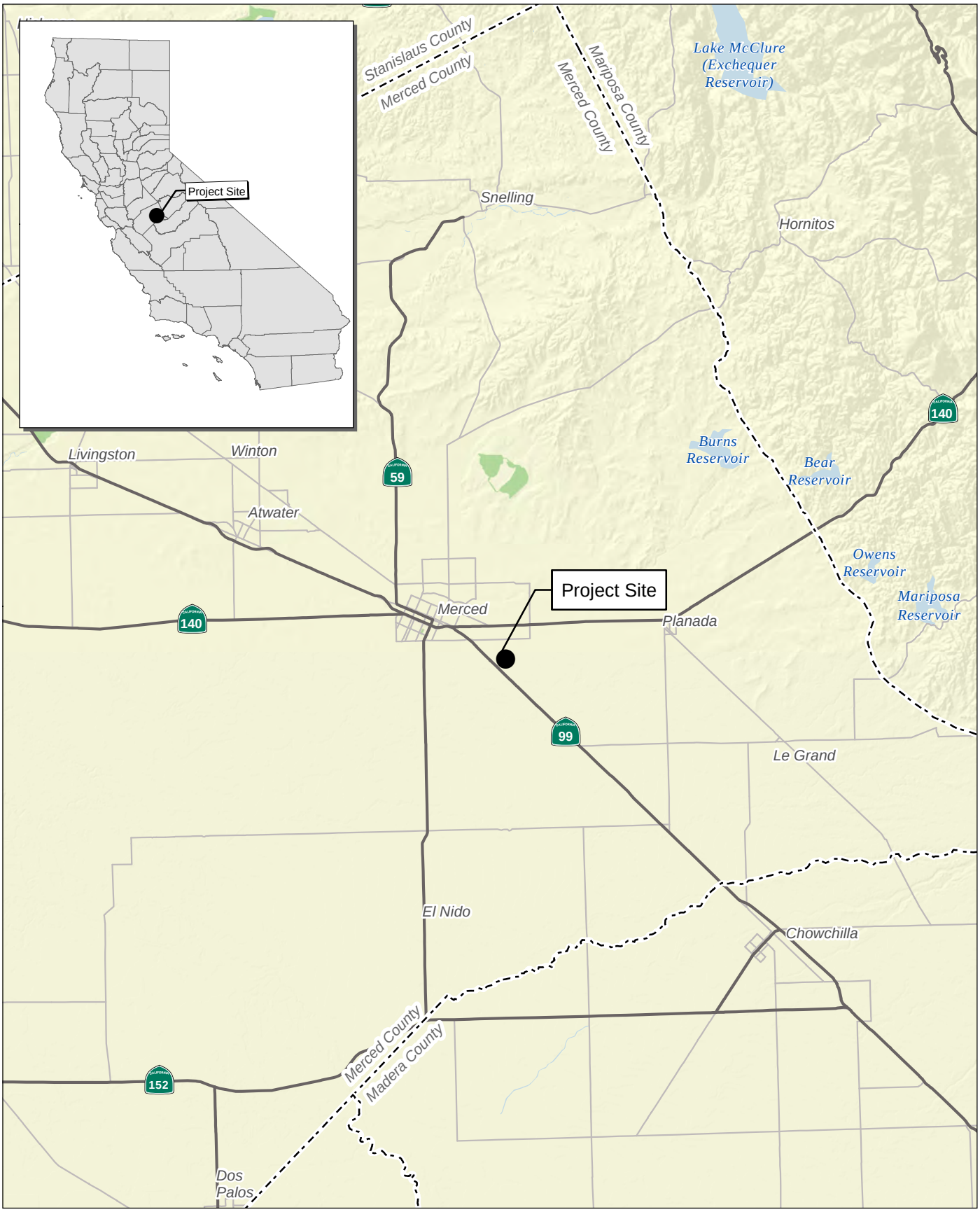
The project site currently has two General Plan land use designations and two zoning designations. Approximately 20 acres of the project site abutting E. Gerard Avenue is designated "Medium to High Density Residential" in the Merced Vision 2030 General Plan, and is zoned "R-3-2, Medium Density Residential." Approximately 57.5 acres located on both sides of Campus Parkway are designated "Regional Community Commercial" by the Merced Vision 2030 General Plan and are zoned "C-C, Central Commercial District."

2.2 - Project Characteristics

2.2.1 - Project Characteristics

General Plan Amendment and Zone Change

The project applicant is proposing General Plan Amendments and Zone Changes that would re-configure the boundary between the residential and commercial portions of the site. Overall, the General Plan Amendments and Zone Changes would increase the amount of commercial acreage by 12 acres (resulting in 67.5 acres total) and reduce the amount of residential acreage by approximately 12 acres (resulting in 8 acres total). Although this would result in a reduction in the medium-density residential designation acreage, the Master Plan concept includes a 178-unit, high-density, multi-family residential complex (21 units per acre), which results in a total number of units consistent with the anticipated unit count in the General Plan and which will comply with the City's goals for the regional housing allocation reflected in the City's Housing Element.



Source: Census 2000 Data, The CaSIL, FCS GIS 2013.

FirstCarbon SOLUTIONS

5 2.5 0 5 Miles

Exhibit 2-1
Regional Location Map

THIS PAGE INTENTIONALLY LEFT BLANK

Source: ESRI Imagery, 2014

FirstCarbon SOLUTIONS

1,000 500 0 1,000 Feet

Exhibit 2-2
Local Vicinity Map
Aerial Base

THIS PAGE INTENTIONALLY LEFT BLANK

View of southern portion of project site.

View of Campus Parkway.

View of northern portion of project site.

View of existing non-continuous segments of S. Coffee Street.

Source: FirstCarbon Solutions, 2015.

FirstCarbon® SOLUTIONS

Exhibit 2-3
Site Photographs

THIS PAGE INTENTIONALLY LEFT BLANK

The existing General Plan land use designations are shown in Exhibit 2-4a and the proposed General Plan land use designations are shown in Exhibit 2-4b. The existing zoning is shown in Exhibit 2-5a and the proposed zoning is shown in Exhibit 2-5b.

The General Plan Amendment also includes an amendment to the Circulation Element to eliminate a planned extension of Pluim Drive (collector level street) along the east side of the site and add right turn in and out driveways along the Campus Parkway Expressway (see discussion under "Circulation Alterations"). The existing General Plan Circulation Element is shown in Exhibit 2-6a and the proposed General Plan Circulation Element is shown in Exhibit 2-6b.

Planned Development Zone/Master Plan

The applicant proposes to establish a Planned Development Zone with an accompanying Master Plan for the site that defines the overall site development concept. The Planned Development Zone would permit the development of up to 601,127 square feet of commercial uses and up to 178 multi-family dwelling units. The commercial square footage would be located on both sides of Campus Parkway, with 358,535 square feet on the north side and 242,592 square feet on the south side. Proposed uses would include retail, restaurant, fuel station, movie theater, and hotel. Additionally, 1.53 acres would be reserved for a future Merced Fire Station on Gerard Avenue, 0.13 mile east of Coffee Street. Table 2-1 summarizes the proposed project, based on the net acreage of 71.18. Exhibit 2-7 depicts the conceptual site plan.

Table 2-1: Merced Gateway Master Plan Summary

Status	Use	Acres	Characteristics
North	Residential	8.41	178 multi-family dwelling units
	Commercial	41.12	358,535 square feet
	Public Facility	1.53	9,209-square-foot fire station
	Subtotal	*51.06*	—
South	Commercial	21.56	242,592 square feet
Total (Net)	**—**	**71.18**	**610,336 square feet (Non-Residential)** **178 dwelling units (Residential)**
Source: RRM, 2015.			

North Area

The proposed North Area end uses are summarized in Table 2-2. Exhibit 2-8a and Exhibit 2-8b provide conceptual images of the residential and retail uses, respectively.

Table 2-2: North Area Summary

Use	End Uses	Characteristics
Residential	Multi-Family Residential	178 dwelling units
Commercial	Restaurants (5)	26,615 square feet
	Shops (13)	236,971 square feet
	Movie Theatre	38,773 square feet
	Transit Center	2,000 square feet
	Subtotal	358,535 square feet
Public Facility	Fire Station	9,209-square-foot fire station
Total		**367,744 square feet (Non-Residential)** **178 dwelling units (Residential)**
Source: RRM, 2015.		

South Area

The proposed South Area end uses are summarized in Table 2-3. Exhibit 2-8b and Exhibit 2-8c provide conceptual images of the retail and hotel uses, respectively.

Table 2-3: South Area Summary

Use	End Uses	Characteristics
Commercial	Restaurants (5)	25,780 square feet
	Retail (4)	160,607 square feet
	Gas Station, Convenience Market, Car Wash	6,305 square feet
	Hotel	49,900 square feet 81 rooms
Total		**242,592 square feet (Non-Residential)**
Source: RRM, 2015.		

Phasing

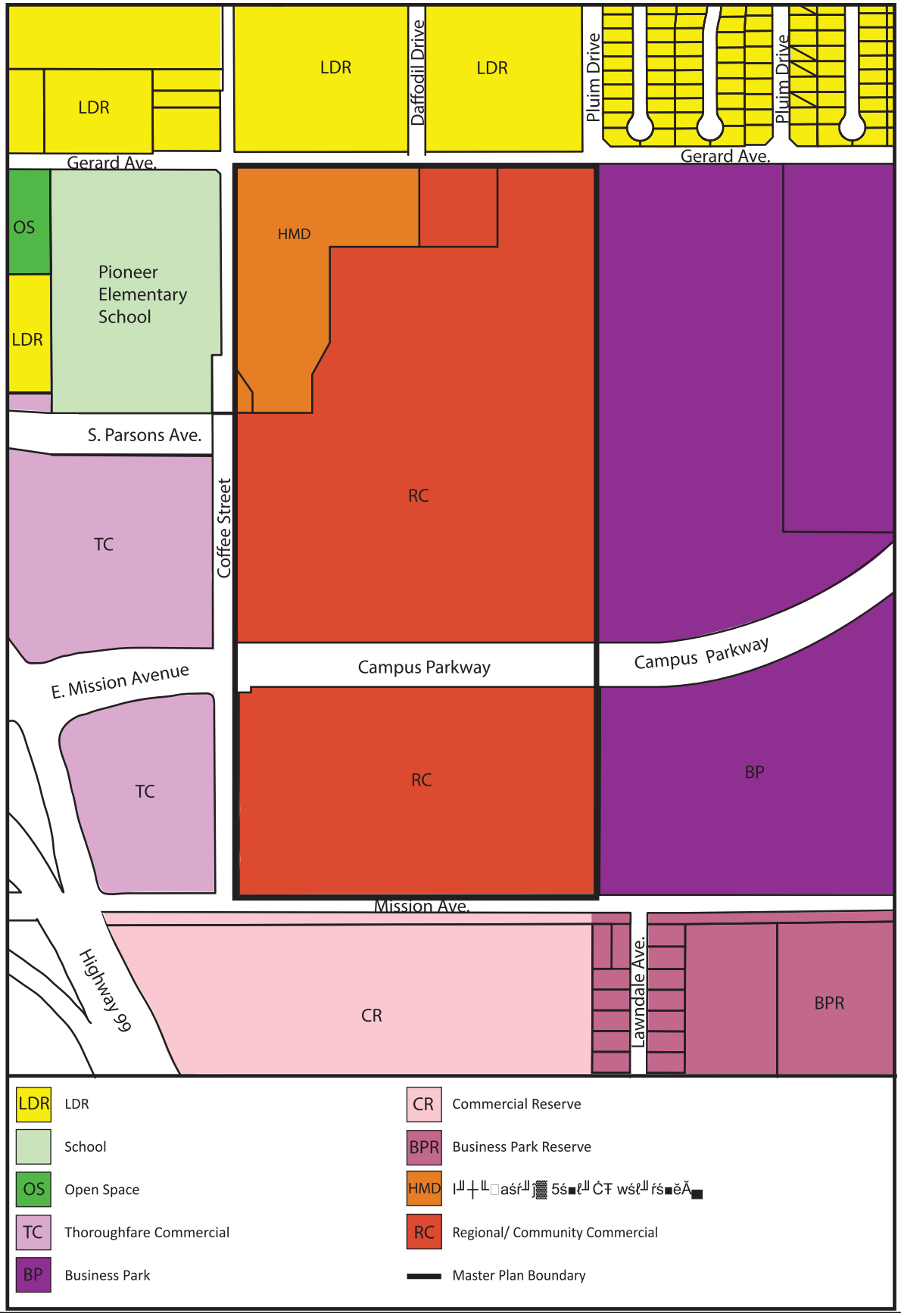
The project would be constructed in five phases, over 10 years. Table 2-4 describes the subareas and the timing of each phase. Exhibit 2-9 shows the location of the corresponding subareas for each phase listed in Table 2-4. It is estimated that construction would begin in 2017 and be completed by 2026, and the project would be fully operational in 2027.

Source: rrm design group, 2015

FirstCarbon® SOLUTIONS

Exhibit 2-4a
Existing General Plan Land Use Designations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: rrm design group, 2016

FirstCarbon® SOLUTIONS

Exhibit 2-4b
Proposed General Plan Land Use Designations

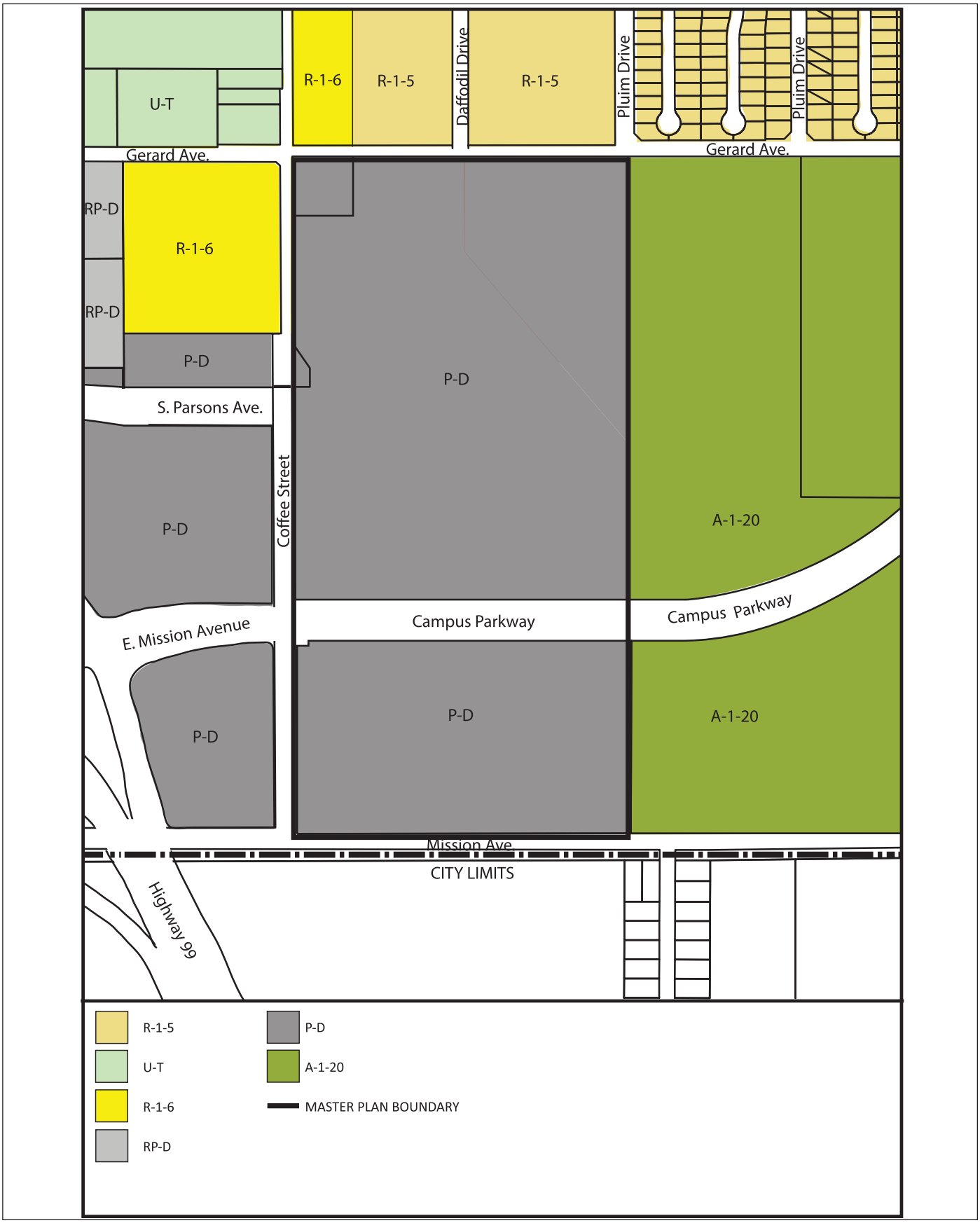
THIS PAGE INTENTIONALLY LEFT BLANK

Source: rrm design group, 2015

FirstCarbon® SOLUTIONS

Exhibit 2-5a
Existing Zoning

THIS PAGE INTENTIONALLY LEFT BLANK

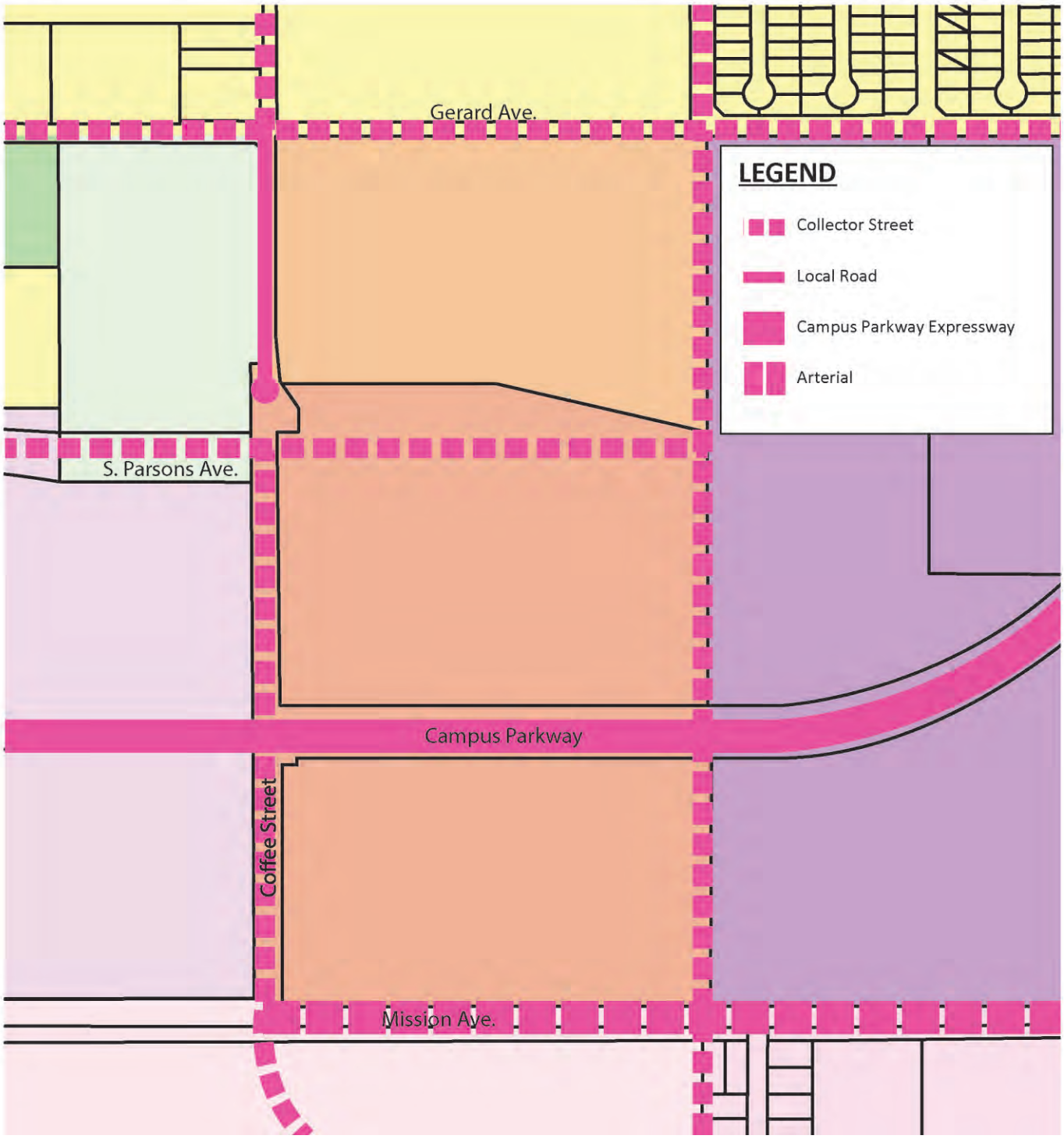


Source: rrm design group, 2016

FirstCarbon® SOLUTIONS

Exhibit 2-5b
Proposed Zoning

THIS PAGE INTENTIONALLY LEFT BLANK

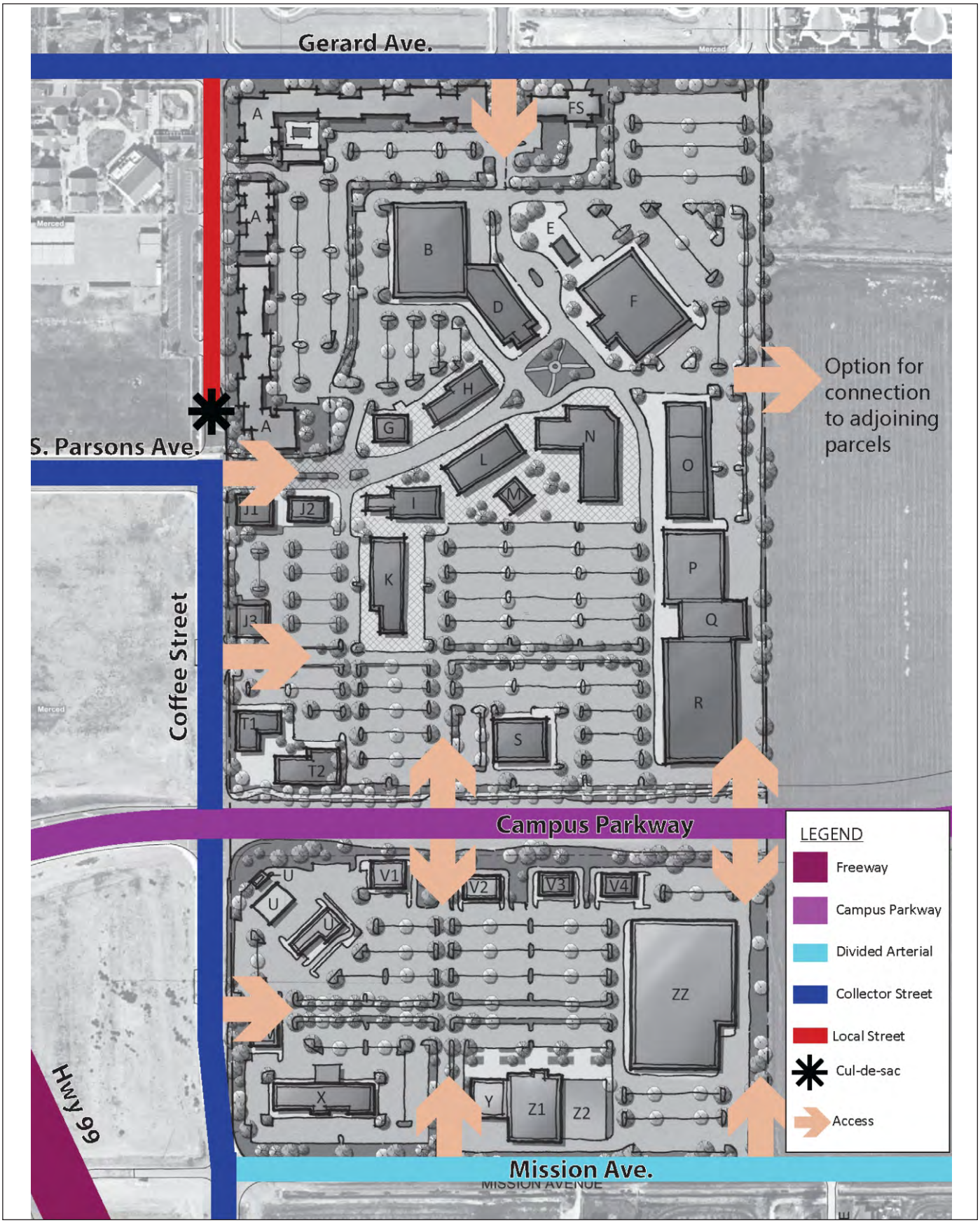


Source: rrm design group, 2015

FirstCarbon SOLUTIONS

Exhibit 2-6a
Existing General Plan Circulation Element

THIS PAGE INTENTIONALLY LEFT BLANK

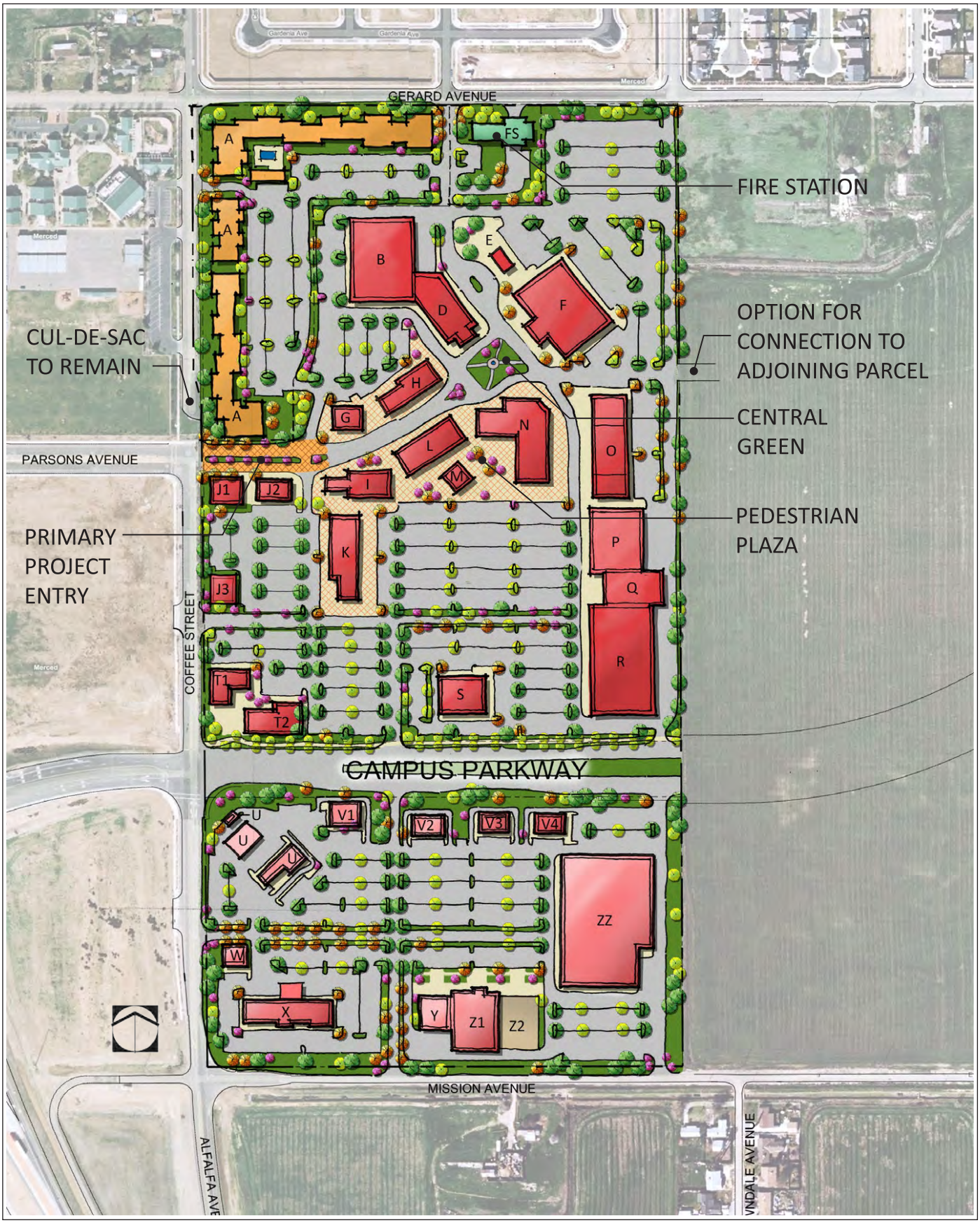


Source: rrm design group, 2016

FirstCarbon® SOLUTIONS

Exhibit 2-6b
Proposed General Plan Circulation Element

THIS PAGE INTENTIONALLY LEFT BLANK



Source: rrm design group, 2016

FirstCarbon® SOLUTIONS

Exhibit 2-7
Conceptual Site Plan

THIS PAGE INTENTIONALLY LEFT BLANK

Source: rrm design group, 2015

FirstCarbon® SOLUTIONS

Exhibit 2-8a
Residential Conceptual Image

THIS PAGE INTENTIONALLY LEFT BLANK

Source: rrm design group, 2015

FirstCarbon® SOLUTIONS

Exhibit 2-8b
Retail Plaza Conceptual Image

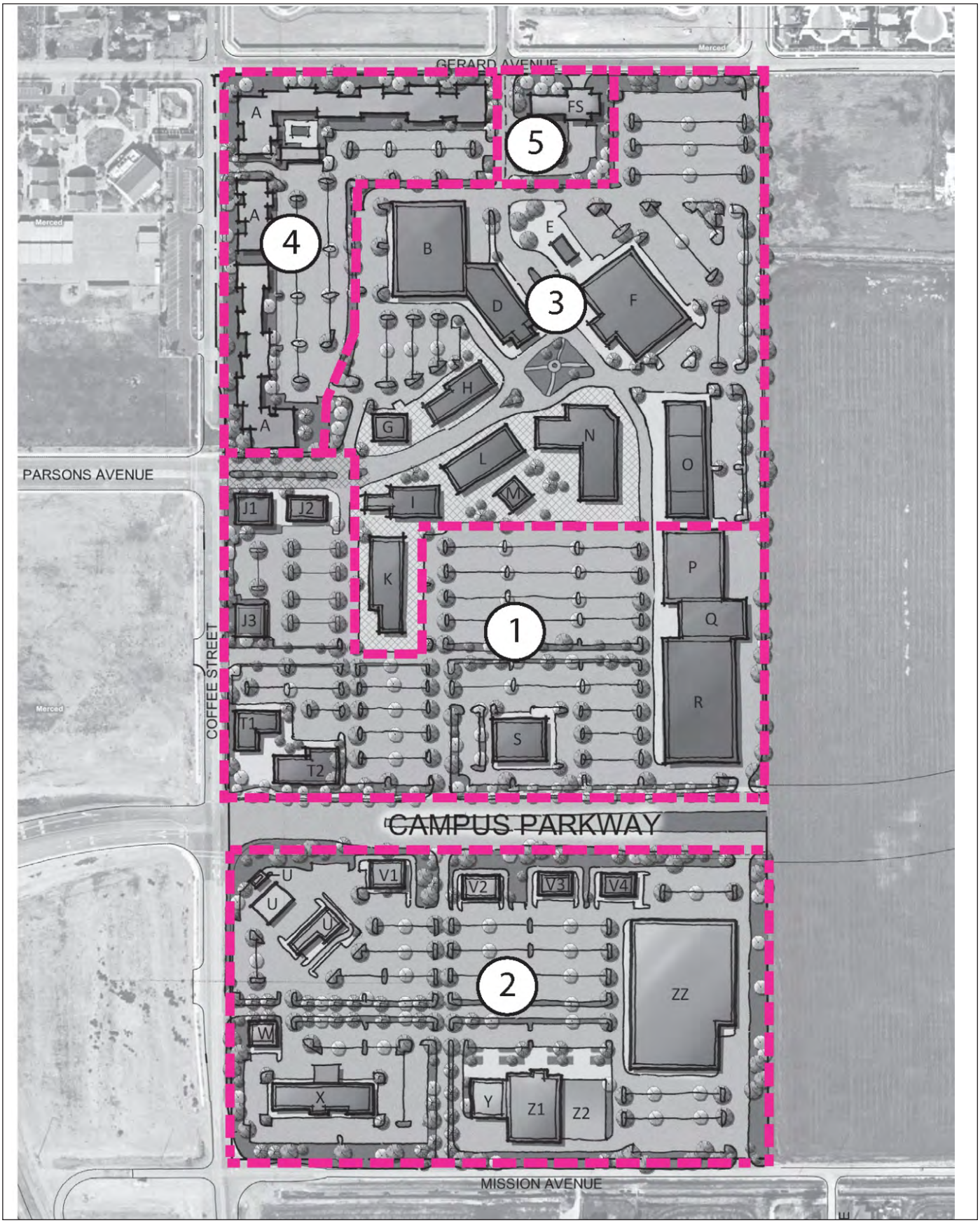
THIS PAGE INTENTIONALLY LEFT BLANK

Source: rrm design group, 2015

FirstCarbon® SOLUTIONS

Exhibit 2-8c
Hotel Conceptual Image

THIS PAGE INTENTIONALLY LEFT BLANK



Source: rrm design group, 2016

FirstCarbon® SOLUTIONS

Exhibit 2-9
Development Phasing Concept

THIS PAGE INTENTIONALLY LEFT BLANK

Table 2-4: Proposed Phasing

Phase	Square Feet	Total Units/Rooms
Phase 1		
Retail	71,330	—
Restaurants	17,522	—
Grocery	54,176	—
Subtotal	**143,028**	**—**
Phase 2		
Retail	166,912	—
Restaurants/Fast Food	25,780	—
Hotel	49,900	81 rooms
Subtotal	**242,592**	**81 rooms**
Phase 3		
Retail	165,641	—
Restaurants	9,093	—
Theater	38,773	—
Transit	2,000	—
Subtotal	**215,507**	**—**
Phase 4		
Residential	—	178 max
Clubhouse	2,500	—
Subtotal	**2,500**	**178**
Phase 5		
Fire Station	9,209	—
Subtotal	**9,209**	**—**
Source: RRM, 2015.		

Vehicular Access

Vehicular access to the commercial uses on the south side of Campus Parkway is proposed to be taken from two right-in, right-out points out on Campus Parkway; a right-in and right-out turns on S. Coffee Street; and two full access points on E. Mission Avenue.

Vehicular access to the commercial uses on the north side of Campus Parkway are proposed to be taken from one full access points on S. Coffee Street (below the road block), and one right-in and right-out (below Parsons Avenue); two right-in and right-out driveways to Campus Parkway; and two full access points on Gerard Avenue.

Vehicular access to the multi-family residential uses would be taken from two full access points (one E. Gerard Avenue and another on Coffee Street) via reciprocal access from the commercial uses, and direct access from one full access driveway on Coffee Street immediately south of the Gerard Avenue/Coffee Street intersection.

Circulation Alterations

A planned extension of Pluim Drive south along the eastern boundary of the site would be eliminated as part of this General Plan Amendment. Additionally, the project proposes to add four right-turn in and out driveways, along Campus Parkway Expressway.

Utilities

Underground storm drainage, water, sewer, electrical, and natural gas facilities are located within adjacent roadways. The project would connect to these existing facilities. Stormwater runoff that cannot be detained on-site will be accommodated by an existing off-site County of Merced terminal drainage basin at the intersection of Mission Avenue and Coffee Street southwest of the Master Plan Area.

2.3 - Project Objectives

The objectives of the proposed project are to:

1. Positively contribute to the local economy through new capital investment, creation of new employment opportunities, expansion of the tax base, and increased retail offerings.
2. Reinforce Merced's status as a regional retail node and employment center by increasing commercial offerings.
3. Develop regional-serving and highway-oriented commercial uses on a highly visible site near SR-99 in order to cater to local residents and travelers.
4. Promote residential and economic growth in accordance with the goals and policies set forth in the Merced Vision 2030 General Plan.
5. Develop new multi-family residential uses in southeast Merced to provide additional diverse housing options in a growing part of the City.
6. Design a site plan that provides convenient internal circulation, while also minimizing access conflicts between the residential and commercial uses.
7. Reserve a site for a future public safety facility in the interests of ensuring that adequate fire protection is provided in the future.

2.4 - Intended Uses of this Draft EIR

This Draft EIR is being prepared by the City of Merced to assess the potential environmental impacts that may arise in connection with actions related to implementation of the proposed project. Pursuant to CEQA Guidelines Section 15367, the City of Merced is the lead agency for the project

and has discretionary authority over the project and project approvals. This Draft EIR is intended to address all public infrastructure improvements and all future development that are within the parameters of the proposed project.

2.4.1 - Discretionary and Ministerial Actions

Discretionary approvals and permits are required by the City of Merced for implementation of the proposed project.

- General Plan Amendment
- Zone Change and Establishment of a Planned Development

Subsequent ministerial actions would be required for the implementation of the proposed project, including issuance of grading and building permits and Site Plan Review.

2.4.2 - Responsible and Trustee Agencies

A number of other agencies in addition to the City of Merced will serve as Responsible and Trustee Agencies, pursuant to CEQA Guidelines Section 15381 and Section 15386, respectively. This Draft EIR will provide environmental information to these agencies and other public agencies, which may be required to grant approvals or coordinate with other agencies, as part of project implementation. These agencies may include, but are not limited to, the following:

- California Department of Transportation
- Central Valley Regional Water Quality Control Board
- California Department of Fish and Wildlife
- San Joaquin Valley Air Pollution Control District
- County of Merced

Actions that are necessary to implement the project that must be taken by other agencies are:

- Issuance of Encroachment Permits for work within a State Highway—California Department of Transportation
- Issuance of Encroachment Permits for work within a County Roadway—County of Merced
- License agreement for the use of a County of Merced-owned terminal drainage basin.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 3: ENVIRONMENTAL IMPACT ANALYSIS

Organization of Issue Areas

This Draft Environmental Impact Report (Draft EIR) provides analysis of impacts for those environmental topics where it was determined in the Notice of Preparation, or through subsequent analysis that the proposed project would result in "potentially significant impacts." Sections 3.1 through 3.11 discuss the environmental impacts that may result with approval and implementation of the proposed project.

Issues Addressed in this EIR

The following environmental issues are addressed in Section 3:

- Aesthetics, Light, and Glare
- Agricultural Resources
- Air Quality/Greenhouse Gas Emissions
- Biological Resources
- Cultural Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Noise
- Public Services and Utilities
- Transportation

Level of Significance

Determining the severity of project impacts is fundamental to achieving the objectives of CEQA. CEQA Guidelines Section 15091 requires that decision makers mitigate, as completely as is feasible, the significant impacts identified in the Final EIR. If the EIR identifies any significant unmitigated impacts, CEQA Guidelines Section 15093 requires decision makers in approving a project to adopt a statement of overriding considerations that explains why the benefits of the project outweigh the adverse environmental consequences identified in the EIR.

The level of significance for each impact examined in this Draft EIR was determined by considering the predicted magnitude of the impact against the applicable threshold. Thresholds were developed using criteria from the CEQA Guidelines and checklist; state, federal, and local regulatory schemes; local/regional plans and ordinances; accepted practice; consultation with recognized experts; and other professional opinions.

Impact Analysis and Mitigation Measure Format

The format adopted in this EIR to present the evaluation of impacts is described and illustrated below.

Summary Heading of Impact

Impact AES-1:	**An impact summary heading appears immediately preceding the impact description (Summary Heading of Impact in this example). The impact number identifies the section of the report (AES for Aesthetics, Light, and Glare in this example) and the sequential order of the impact (1 in this example) within that section. To the right of the impact number is the impact statement, which identifies the potential impact.**

Impact Analysis

A narrative analysis follows the impact statement.

Level of Significance Before Mitigation

This section identifies the level of significance of the impact before any mitigation is proposed.

Mitigation Measures

In some cases, following the impact discussion, reference is made to state and federal regulations and agency policies that would fully or partially mitigate the impact. In addition, policies and programs from applicable local land use plans that partially or fully mitigate the impact may be cited.

Project-specific mitigation measures, beyond those contained in other documents, are set off with a summary heading and described using the format presented below:

MM AES-1 Project-specific mitigation is identified that would reduce the impact to the lowest degree feasible. The mitigation number links the particular mitigation to the impact it is associated with (**AES-1** in this example); mitigation measures are numbered sequentially.

Level of Significance After Mitigation

This section identifies the resulting level of significance of the impact following mitigation.

Abbreviations used in the mitigation measure numbering are:

Code	Environmental Issue
AES	Aesthetics, Light, and Glare
AG	Agricultural Resources
AIR	Air Quality/Greenhouse Gas Emissions
BIO	Biological Resources

Code	Environmental Issue
CUL	Cultural Resources
HAZ	Hazards and Hazardous Materials
HYD	Hydrology and Water Quality
LU	Land Use
NOI	Noise
PSU	Public Services and Utilities
TRANS	Transportation

THIS PAGE INTENTIONALLY LEFT BLANK

3.1 - Aesthetics, Light, and Glare

3.1.1 - Introduction

This section describes the existing aesthetics, light, and glare setting and potential effects from project implementation on visual resources and the site and its surroundings. Descriptions and analysis in this section are based on site reconnaissance by FirstCarbon Solutions (FCS) personnel, as well as review of the Merced Vision 2030 General Plan and the proposed Merced Gateway Master Plan.

3.1.2 - Environmental Setting

Visual Character

Regional Setting

Merced is located in the northern portion of the San Joaquin Valley, the approximately 250-mile-long basin that extends from the Sacramento-San Joaquin Delta in the north to the Tehachapi Mountains in the south. The valley is bounded by the Coast Range to the west and the Sierra Nevada Mountains to the east. The San Joaquin Valley consists of predominantly broad plains that drain towards the delta and contains some of the most productive agricultural land in the world. The valley is home to several well-populated metropolitan areas, including Fresno, Bakersfield, Stockton, Modesto, and Merced.

The City of Merced, like many cities in the San Joaquin Valley, is bisected by State Route 99 (SR-99) and the Union Pacific Railroad tracks. Bear Creek meanders through the City from east to west. The Downtown area is characterized by historic buildings and a grid pattern street network, while the newer outlying areas employ more recent development and a traditional suburban street layout. Notable landmarks in the Merced area include the historic Merced County Courthouse, the Merced Theatre, the Applegate Park, and the University of California Merced campus.

Project Site

The 77.5-acre project site contains undeveloped land that is regularly disked. Weedy vegetation is present throughout the project site. A barbed wire fence is located around the perimeter of the project site. Wooden signs advertising the project site as available for commercial development face the intersection of Campus Parkway/S. Coffee Street. Site photographs are provided in Exhibit 2-3.

Surrounding Land Uses

West

S. Coffee Street forms the western boundary of the project site. West of S. Coffee Street are Pioneer Elementary School (north of E. Parsons Avenue), two undeveloped parcels designated for "Thoroughfare Commercial" by the Merced Vision 2030 General Plan (north and south of Campus Parkway), and the SR-99/Campus Parkway interchange.

The project site has unobstructed views of the land uses to the west and vice versa.

North

E. Gerard Avenue forms the northern boundary of the project site. North of E. Gerard Avenue are single-family residential uses designated "Low Density Residential" by the Merced Vision 2030 General Plan.

The project site has unobstructed views of the land uses to the north and vice versa.

East

Undeveloped land that was previously used for cultivated agriculture is located east of the project site. This land is designated for "Business Park" use by the Merced Vision 2030 General Plan.

The project site has unobstructed views of the land uses to the east and vice versa.

South

E. Mission Avenue forms the southern boundary of the project site. South of E. Mission Avenue is undeveloped land designated "Regional Commercial Reserve" by the Merced Vision 2030 General Plan.

The project site has unobstructed views of the land uses to the south and vice versa.

Scenic Corridors

The Merced Vision 2030 General Plan identifies Campus Parkway as a Scenic Corridor, but SR-99 is not an "Officially Designated" or "Eligible" State Scenic Highway in Merced County.

Light and Glare

There are currently no sources of light and glare within the project boundaries. Street lighting is present along S. Coffee Street and Campus Parkway. Additionally, pedestrian-level lighting is present along the multi-use pathway on the north side of Campus Parkway.

3.1.3 - Regulatory Framework

Local

City of Merced

Merced Vision 2030 General Plan

The Merced Vision 2030 General Plan sets forth the following policies relevant to aesthetics, light, and glare:

- **Policy L-1.1:** Promote balanced development which provides jobs, services and housing.
- **Policy L-1.2:** Encourage a diversity of building types, ownership, prices, designs, and site plans for residential areas throughout the City.
- **Policy L-1.5:** Protect existing neighborhoods from incompatible developments.
- **Policy L-1.6:** Continue to pursue quality single-family and higher density residential development.
- **Policy L-1.7:** Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.

- **Policy L-1.8:** Create livable and identifiable residential neighborhoods.
- **Policy L-1.9:** Ensure connectivity between existing and planned urban areas.
- **Policy L-3.1:** Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increased number of their daily trips.
- **Policy L-3.2:** Encourage infill development and a compact urban form.
- **Policy L-3.3:** Promote site designs that encourage walking, cycling, and transit use.
- **Policy L-3.4:** Build identity, character, and enhanced community design in the South Merced Community Plan area.
- **Policy UD-1.1:** Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.
- **Policy UD-1.2:** Distribute and design Urban Villages to promote convenient vehicular, pedestrian, and transit access.
- **Policy UD-1.3:** Promote and facilitate Core Commercial design principles in Village commercial areas.
- **Policy UD-1.4:** Promote and facilitate Urban Village residential area design principles.
- **Policy UD-1.5:** Design and develop public and quasi-public buildings and uses utilizing Transit-Ready Development or Urban Village principles.

3.1.4 - Methodology

FCS evaluated aesthetics, light, and glare impacts through site reconnaissance and review of the Merced Vision 2030 General Plan and the proposed Merced Gateway Master Plan. FCS personnel visited the project site in August 2015 and documented existing visual conditions with photographs. FCS reviewed the Merced Vision 2030 General Plan to identify applicable goals and policies that pertain to the proposed project. Finally, FCS reviewed the Merced Gateway Master Plan's provisions that pertain to visual character and light and glare.

3.1.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist of the CEQA Guidelines, aesthetics impacts resulting from the implementation of the proposed project would be considered significant if the project would:

a) Have a substantial adverse effect on a scenic vista? (Refer to Section 7, Effects Found not to be Significant.)

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway? (Refer to Section 7, Effects Found not to be Significant.)

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

3.1.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Scenic Vistas

Impact AES-1:	**The project would not have a substantial adverse effect on a scenic vista.**

Impact Analysis

The Merced Vision 2030 General Plan does not identify any visual resources or scenic vistas in the vicinity of the project site. In the project vicinity, the Sierra Nevada Mountains are visible to the north and east on clear days.

The proposed Merced Gateway Master Plan would guide the development of 178 multi-family dwelling units, up to 601,127 square feet of commercial uses, and a fire station on 77.5 acres in the southern portion of the City of Merced. Residential buildings would be limited to 40 feet above finished grade, while commercial buildings would be limited to 60 feet above finished grade. Residential buildings would be allowed up to 60 percent lot coverage, while commercial buildings would be allowed up to 35 percent lot coverage. These heights and lot coverage limits would be similar to other developments in Merced. Moreover, given the absence of developed land uses to the west, east, and south, there would be no potential for adverse impacts on scenic vistas. For the developed residential uses to the north, the proposed project would not obstruct views of the Sierra Nevada Mountains to the north or east. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Scenic Corridors

Impact AES-2:	**The project would not substantially damage scenic resources within a scenic corridor.**

Impact Analysis

The Merced Vision 2030 General Plan identifies Campus Parkway as a Scenic Corridor. The General Plan sets forth the following design considerations along Scenic Corridors:

- Utility lines should be placed underground whenever feasible.
- Signing should be carefully controlled to insure that it does not detract from the scenic beauty of the corridor. Specific guidelines for signing along these corridors should be established.

- Limit the intrusion of future land uses which may detract from the scenic quality of the corridor.
- Unsightly mechanical and utility structures shall be screened from view by use of planting, grading, and fencing.
- Heights and setbacks of buildings should be regulated to avoid obstructing important scenic views.
- Every effort should be made to preserve and properly maintain existing stands of trees and other plant materials of outstanding value.
- Structures on private and public properties visible from the corridor should be maintained in good condition (free of trash, weeds, etc.).
- Architectural and landscape design should result in an attractive appearance and a harmonious relationship with the surrounding environment.

The proposed Merced Gateway Master Plan sets forth Development Standards (height limits, lot coverage limits, setbacks, etc.) to ensure that buildings are visually appealing and compatible with their surroundings. The Master Plan requires landscaping along the Campus Parkway frontage and places limits on the number and types of signs permitted along the roadway. All utilities are currently located underground—and this requirement would be carried forward by the Master Plan. This would ensure that the proposed project would not have adverse visual impacts on Campus Parkway. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Visual Character

Impact AES-3:	**The project would not substantially degrade the existing visual character or quality of the site and its surroundings.**

Impact Analysis

The proposed Merced Gateway Master Plan would guide the development of 178 multi-family dwelling units, up to 601,127 square feet of commercial uses, and a fire station on 77 undeveloped acres in the southern portion of the City of Merced. The following is a summary of key aspects of the Master Plan as it relates to visual character.

General Plan Amendment and Zone Change

The project site currently has two General Plan land use designations and two zoning designations. Approximately 20 acres of the project site abutting E. Gerard Avenue is designated "Medium to High Density Residential" in the Merced Vision 2030 General Plan, and is zoned "R-3-2.". Approximately 57.5 acres located on both sides of Campus Parkway are designated "Regional Community Commercial" by the Merced Vision 2030 General Plan, and is zoned "C-C."

The proposed General Plan Amendment and Zone Change would increase the amount of commercial acreage by 12 acres (67.5 acres total) and reduce the amount of residential acreage by approximately 12 acres (8 acres total). As a practical matter, this would exchange urban density residential uses for urban density commercial uses within an area contemplated to support urban uses by the Merced Vision 2030 General Plan and Zoning Ordinance. This would not represent a significant change in visual character.

Development Program

The Master Plan's development program includes a conceptual mix of uses based on current market trends, City development regulations, and site constraints. Based on this analysis, it was determined that the Master Plan area could include a maximum of 178 residential units and 601,127 square feet of commercial. The Conceptual Site Plan identifies potential locations for program components and includes lettered building pads that correspond with Master Plan Table 1. Future developers will be able to rearrange these components and adjust building square footage as long as they do not exceed the maximum permitted square footage.

The development program contemplates the following end uses:

Fire Station Parcel

The Conceptual Site Plan shows an approximately 9,000-square-foot fire station located in the northern portion of the Master Plan area adjacent to Gerard Avenue. This fire station location will be provided to improve fire service and response times to this area of the City. The fire station will benefit from the Coffee Street connection in order to quickly access SR-99 in emergencies.

Residential Parcel

The 8.4-acre residential parcel is located in the northwest corner of the Master Plan area and serves as a transition from neighboring residential uses and an elementary school to proposed commercial areas. A maximum of 178 residential units are permitted at a density of 12–24 du/ac. units per acre. Development of this parcel is subject to the provisions of Chapter 20.14 "R-3 District" of the City's Municipal Code. On-site amenities may include a 2,500-square-foot clubhouse and pool area.

Residential uses would be limited to 40 feet above finished grade (architectural projections are allowed to stand up to 46 feet above finished grade) and 60 percent lot coverage.

North Parcel

This 41-acre parcel is programmed to include up to 385,535 square feet of commercial uses. The Master Plan identifies individual program components, which include a 54,000-square-foot grocery

store, five restaurants totaling 26,600 square feet, 11 retail shops totaling 237,000 square feet, one 38,800-square-foot movie theater, and a 2,000-square-foot transit center.

Commercial uses would be limited to 60 feet above finished grade and 35 percent lot coverage.

South Parcel

This 21-acre parcel is programmed to include up to 242,592 square feet of commercial uses. The Master Plan identifies individual program components, which include a 6,000-square-foot automobile service station, four fast food establishments totaling 21,450 square feet, one 4,000-square-foot restaurant, four retail stores totaling 160,607 square feet, and one 50,000-square-foot hotel that can accommodate up to 81 hotel rooms.

Commercial uses would be limited to 60 feet above finished grade and 35 percent lot coverage.

Parking

The number of parking spaces required for the development of residential and commercial projects within the Master Plan area are consistent with Chapter 28.58 of the City's Municipal Code. These requirements are summarized in Master Plan Table 1. However, with the final design of each individual phase, a reduction in parking may be considered by the City with a joint parking agreement or parking reduction program. The intent is to reduce the amount of asphalt/non-pervious surfaces within the Master Plan area.

Central Green

One of the key place-making amenities provided within the Master Plan area is an approximately 1-acre central green located in front of the potential theater/entertainment center.

Analysis

Buildout of the Master Plan would result in the development of urban development on an undeveloped 77-acre site. Although this would irreversibly alter the visual character of the project site, this in itself does not constitute a significant impact. Rather, when evaluated in context of the Merced Vision 2030 General Plan—which has long designated the project site for urban development—and development patterns in the project vicinity, the proposed Master Plan represents logical and planned growth. Moreover, the Master Plan sets forth development standards and design guidelines that establish parameters for architecture, site layout, landscaping, signage, lighting, and other areas to ensure that new development is attractive and compatible with surrounding land uses. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Light and Glare

Impact AES-4: The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Impact Analysis

The proposed Merced Gateway Master Plan would guide the development of 178 multi-family dwelling units, up to 601,127 square feet of commercial uses, and a fire station on 77 acres in the southern portion of the City of Merced. New exterior lighting is proposed for safety and security purposes, including downward-acing pole lights, wall-mounted sconces, parking lot lighting, and landscape lighting. In order to prevent adverse impacts from these new sources of lighting, the Master Plan includes the following design guidelines for lighting:

- Lighting should be designed to provide ambiance, safety, and security without unnecessary spillover or glare onto adjacent properties. This design is particularly important for the residential users who may be located on an adjacent parcel or nearby neighborhood.
- The quality of light, level of light (as measured in foot-candles) and the type of bulb or source should be carefully addressed. Lighting levels should not be so intense as to draw attention to the flow or glare of the project site. The lighting plan should incorporate current energy-efficient fixtures and technology.
- Glare from any site lighting should be shielded from adjacent properties and directed at a specific object or target area. Exposed bulbs should not be used.
- Building light fixtures should be designed or selected to be architecturally compatible with the main structure, which should complement the theme of the surrounding area.
- Wall-mounted light fixtures should not extend above the height of the wall to which the fixtures are mounted.
- Accent lighting that is downlit and focused on key architectural elements and trees can be effective and attractive; however, light sources should be screened from view.
- Blinking, flashing lights and exposed neon lighting used to illuminate building façades or to outline buildings should not be used. (Exception: Temporary decorative lights such as holiday lighting may be allowed for up to a four-week period during the calendar year.)
- When security lighting is necessary, it should be recessed, hooded and located to illuminate only the intended area. Off-site glare and light trespass should be prevented.
- Pedestrian areas, paseos, sidewalks, parking lots and building entrances should be adequately lit to provide safety and security.
- All exterior lighting fixtures should be efficient in terms of design and energy use. Low- and high-pressure sodium lamps are permitted in public areas, but prohibited on structures.

Additionally, the Mitigation Monitoring and Reporting Program for the Merced Vision 2030 General Plan (Appendix J) includes Mitigation Measure 3.1-4 whose function is to reduce illumination

impacts, and is applicable to the project that is tiering off Merced's General Plan EIR. The standards in the Merced Gateway Master Plan, where necessary, will be amended to be consistent with this mitigation measure.

The implementation of these design guidelines would ensure that the proposed project would not create new sources of light which would adversely affect day or nighttime views in the area. In addition, the project is not anticipated to utilize building materials or involve uses that would create new sources of significant glare. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

THIS PAGE INTENTIONALLY LEFT BLANK

3.2 - Agricultural Resources

3.2.1 - Introduction

This section describes the existing agricultural resources and potential effects from the Merced Gateway Project implementation on the project site and its surrounding area. Descriptions and analysis in this section are based on information provided by the November 30, 2015 Land Evaluation and Site Assessment (LESA) Model prepared by FirstCarbon Solutions (FCS), the California Department of Conservation Farmland Mapping and Monitoring Program, the United States Department of Agriculture Natural Resources Conservation Service Web Soil survey, the California Department of Conservation's Williamson Act and Farmland Mapping and Monitoring Program, and the City of Merced General Plan. The LESA Model is provided in this EIR as Appendix B.

3.2.2 - Environmental Setting

Agriculture in the City of Merced

According to the City of Merced General Plan, agriculture has historically been the economic driver for Merced County. The City of Merced has seen a trend of increasing economic diversification since the 1980s (City of Merced 2012). Although urbanization has increased, the City of Merced has gained agricultural land in the 2030 General Plan compared to the 2015 General Plan (City of Merced 2012).

Economy

Between 2011 and 2014, the value of Merced County agricultural commodities ranged from 3.3 billion dollars to 4.4 billion dollars (Merced County Department of Agriculture 2014). Table 3.2-1 summarizes agricultural production in Merced County between 2011 and 2013. Table 3.2-2 summarizes the County's top ten commodities in 2013.

Table 3.2-1: Merced County Agricultural Economy (2011-2014)

Year	Total Gross Value
2011	$3,259,868,000
2012	$3,280,207,000
2013	$3,799,070,000
2014	$4,429,987,000
Source: Merced County Department of Agriculture 2014.	

Table 3.2-2: Merced County Top Ten Commodities (2013)

Commodity	Value
Milk (including Market & Manufacturing)	$1,442,690,000
Almonds (Kernel Basis)	$790,754,000

Table 3.2-2 (cont.): Merced County Top Ten Commodities (2013)

Commodity	Value
Cattle & Calves	$350,092,000
Chickens (including Fryers & Other Chickens)	$309,133,000
Sweet Potatoes	$217,003,000
Tomatoes	$183,950,000
Silage (Corn)	$165,694,000
Hay (Alfalfa)	$150,036,000
Eggs, Chicken (Market)	$94,075,000
Cotton (including Acala & Pima Cotton)	$80,199,000
Source: Merced County Department of Agriculture 2014.	

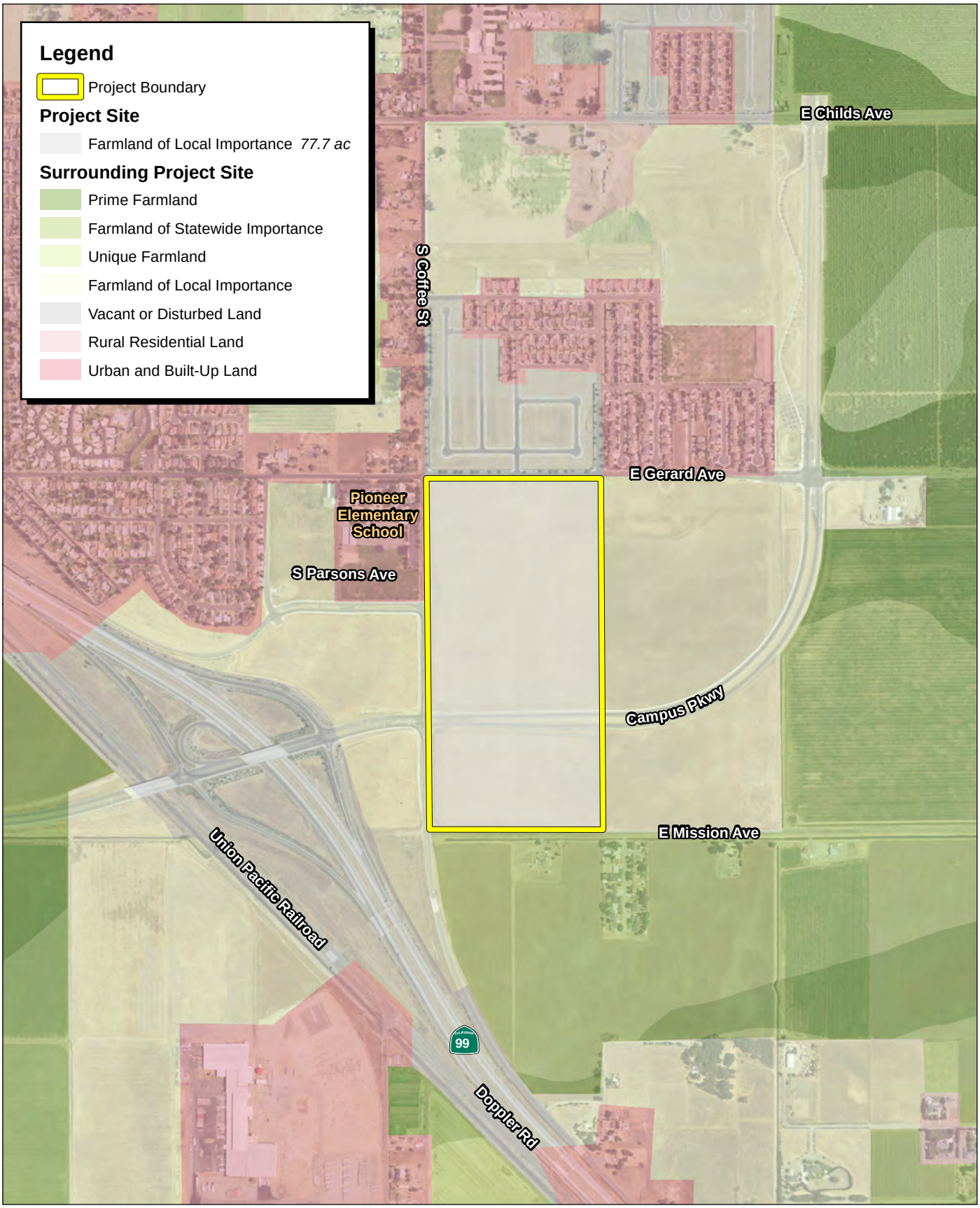
Farmland Classifications

According to California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) maps, the project site contains 77.5 acres of Farmland of Local Importance (Exhibit 3.2-1). The California Department of Conservation Farmland Mapping and Monitoring Program classifies agricultural land into five categories, listed below:

- **Prime Farmland:** Land with the best combination of physical and chemical features able to sustain the long-term production of agricultural crops. These lands have the soil quality, growing season, and moisture supply needed to produce sustained high yields.
- **Unique Farmland:** Land of lesser-quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards, as found in some climactic zones in California.
- **Farmland of Statewide Importance:** Land similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to hold and store moisture.
- **Farmland of Local Importance:** Land of importance in 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.

Of these five categories, the first four (Prime Farmland, Unique Farmland, Farmland of Statewide Importance, and Farmland of Local Importance) are identified by the FMMP as Important Farmland.

Table 3.2-3 provides a summary of Important Farmland and Grazing Land acreage in Merced County from 2006 to 2014. As shown in the table, Important Farmland acreage has increased and Grazing Land has decreased during the period summarized.



Source: ESRI Imagery, 2014, FMMP 2014

FirstCarbon SOLUTIONS

1,000 500 0 1,000 Feet

Exhibit 3.2-1
Important Farmland Map

THIS PAGE INTENTIONALLY LEFT BLANK

Table 3.2-3: Important Farmland Summary (2006–2014)

Classification	Acres				
	2006	2008	2010	2012	2014
Prime Farmland	272,095	270,641	271,100	271,815	271,912
Farmland of Statewide Importance	153,249	150,875	151,337	153,104	154,502
Unique Farmland	104,418	103,990	109,028	110,699	112,301
Farmland of Local Importance	59,851	67,985	65,057	62,927	62,225
Important Farmland Subtotal	*589,613*	*593,491*	*596,522*	*598,545*	*600,940*
Grazing Land	569,829	567,392	562,461	560,110	556,966
Agricultural Land Subtotal	*1,159,442*	*1,160,883*	*1,158,983*	*1,158,655*	*1,157,906*
Source: California Department of Conservation, 2006–2014.					

Project Site's Farmland Classifications

As indicated by the 2014 Merced County Important Farmland Map (California Department of Conservation 2014), the project site is classified as Farmland of Local Importance. A map depicting the site's FMMP classification is shown in Exhibit 3.2-1.

Surrounding Area's Farmland Classifications

The area surrounding the project site consists of a mixture of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, Vacant or Disturbed Land, and Urban and Built-Up Land.

The LESA model provides guidelines on evaluating the surrounding areas based on a zone of influence. Approximately 77.5 percent of the area surrounding the project site (defined by the zone of influence) is designated as agriculture. The remaining 22.5 percent of the area surrounding the project site consists of Vacant or Disturbed Land and Urban and Built-Up Land.

Williamson Act Contracts

Project Site

The California Land Conservation Act of 1965, commonly known as the Williamson Act (California Government Code Section 51200, et seq.), enables local governments to enter into contracts with private landowners for the purpose of promoting the continued use of the relevant land in agricultural or related open space use. In return, landowners receive property tax assessments that are based on farming and open space uses instead of full market value.

As indicated by the Fiscal Year 2013/2014 Merced County Williamson Act Map, the project site is not encumbered by a Williamson Act contract (California Department of Conservation 2014).

Surrounding Areas

Areas surrounding the project site are not encumbered by Williamson Act contracts (California Department of Conservation 2014).

Project Site's Agricultural Uses

The project site appears to have been used in the past for row or field crops. Historical maps indicate that the project site was used for row crops from 1946 to 2005 (Nationwide Environmental Title Research 2015). Aerial photographs dated 1946, 1958, 1998, and 2005 show the project site covered with green row crops. Aerial photographs dated 2009, 2010, and 2012 show the project site as fallow land (Nationwide Environmental Title Research 2015). Currently, the project site contains undeveloped land that is regularly disked, with weedy vegetation present throughout.

Surrounding Agricultural Uses

Agricultural uses surrounding the project site consist of cultivated land and row crops.

Project Site's Soils

The Natural Resources Conservation Service Web Soil Survey indicates that the majority of the project site (approximately 54 percent) is underlain by Landlow Silty Clay Loam with slopes of 0 to 1 percent (LeA). The remaining approximately 46 percent of the project site is underlain by Wyman clay loam, deep over hardpan of 0 to 1 percent slopes (WnA).

Storie Index

The Storie Index is a soil rating based on soil properties that govern a soil's potential for cultivated agriculture in California. Storie Index ratings are combined into six grade classes ranging from Grade 1 (Excellent) of 81 to 100, to Grade 6 (nonagricultural) of 10 or less. As shown in Table 3.2-4, on-site soils range from Grade 1 (excellent) to Grade 2 (good) on the Storie Index (USDA 2015).

Capability Class

Land Capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Soils are graded according to the limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. Capability Classes are designated by numbers one through eight. The numbers indicate progressively greater limitations and narrower choices for agricultural uses. Class 1 soils have few agricultural limitations, whereas Class 8 soils have limitations that preclude field crop production. Capability classes are provided separately for irrigated and nonirrigated lands. As shown in Table 3.2-4, on-site soil irrigated capability classes are Class 2 (moderate limitations), whereas nonirrigated capability classes are Class 4 (very severe limitations) (USDA 2015).

Table 3.2-4: Storie Index Ratings and Land Capability Class

Soil Type	Storie Index Rating	Irrigated Capability Class	Nonirrigated Capability Class
Landlow silty clay loam (LeA)	Grade 1 (Excellent)	2w	4w
Wyman clay loam, deep over hardpan (WnA)	Grade 2 (Good)	2s	4s
Notes: Capability Class definitions: Class 2: moderate limitations; Class 4: very severe limitations Source: USDA 2015.			

3.2.3 - Regulatory Framework

Federal

Farmland Protection Policy Act

The purpose of the Federal Farmland Protection Policy Act (FPPA) is to minimize federal actions leading to the conversion of farmland to nonagricultural uses by ensuring that federal programs are administered in a manner compatible with state government, local government, and private programs designed to protect farmland. The Natural Resources Conservation Service (NRCS) is the agency primarily responsible for implementing the FPPA, which is a voluntary program that provides funds to help purchase development rights to keep productive farmland in agricultural uses. The program provides matching funds to state, local, or tribal government entities and nongovernmental organizations with existing farmland protection programs to purchase conservation easements. Participating landowners agree not to convert the land to nonagricultural uses and retain all rights to the property for future agriculture. A minimum 30-year term is required for conservation easements, and priority is given to applications with perpetual easements. NRCS provides up to 50 percent of the fair market value of the easement.

State

Important Farmland Inventory System and Farmland Mapping and Monitoring Program

The California Department of Conservation maintains a statewide inventory of farmlands. These lands are mapped by the Division of Land Resource Protection as part of the FMMP. The maps are updated every 2 years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance. As described above, farmlands are divided into the following five categories based on their suitability for agriculture: Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Grazing Land.

The categories of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, together, are defined as “agricultural land” or “farmland” by CEQA (PRC §21060.1(a) and the CEQA Guidelines Appendix G, II(a). Other categories used in the FMMP mapping system are “Urban and Built Up Lands,” “Lands Committed to Nonagricultural Use,” and “Other Lands” (lands that do not meet the criteria of any of the other categories).

Williamson Act

As described above, the California Land Conservation Act of 1965, commonly known as the Williamson Act (California Government Code Section 51200, et seq.), enables local governments to enter into contracts with private landowners for the purpose of promoting the continued use of the relevant land in agricultural or related open space use. In return, landowners receive property tax assessments that are based on farming and open space uses instead of full market value. Local governments receive an annual subvention (subsidy) of forgone property tax revenues from the State via the Open Space Subvention Act of 1971. Amendments to the California State Budget Act of 2009 greatly reduced the Williamson Act Subvention payments, but the Williamson Act Program remains in place and contracts remain in effect.

The Williamson Act empowers local governments to establish "agricultural preserves" consisting of lands devoted to agricultural uses and other compatible uses. Upon establishment of such preserves, the locality may offer to owners of included agricultural land the opportunity to enter into annually renewable contracts that restrict the land to agricultural use for at least 10 years (i.e., the contract continues to run for 10 years following the first date upon which the contract is not renewed). In return, the landowner is guaranteed a relatively stable tax rate, based on the value of the land for agricultural/open space use only, and unaffected by its development potential.

Williamson Act contracts are automatically renewed annually for a 1-year period, unless the property owner applies for non-renewal or early cancellation. The Williamson Act also contains limited provisions for cancellation of contracts, and a substantial penalty for the cancellation is assessed.

Government Code Section 56064 (Cortese-Knox-Hertzberg Act)

Government Code Section 56064 defines '"Prime Agricultural Land" as an area of land, whether a single parcel or continuous parcels, that has not been developed for a use other than an agricultural use and that meets any of the following qualifications:

(a) Land that qualifies, if irrigated, for rating as class I or class II in the USDA Natural Resources Conservation Service land use capability classification, whether or not land is actually irrigated, provided that irrigation is feasible.

(b) Land that qualifies for rating 80 through 100 Storie Index Rating.

(c) Land that supports livestock used for the production of food and fiber and that has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture in the National Range and Pasture Handbook, Revision 1, December 2003.

(d) Land planted with fruit or nut-bearing trees, vines, bushes, or crops that have a nonbearing period of less than five years and that will return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than four hundred dollars ($400) per acre.

(e) Land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than four hundred dollars ($400) per acre for three of the previous five calendar years.

Local

City of Merced

Merced Vision 2030 General Plan

The Merced Vision 2030 General Plan was adopted in January of 2012 and establishes the following goals and policies that are relevant to agricultural and forest resources.

OpenSpace Element

- **Goal OS-2:** Protection of Regional Agricultural Resources
- **Implementing Action 2.1.c:** Minimize conflict between agricultural and urban uses by requiring buffers, such as landscape areas, roadways, or creeks, to separate these uses.

Urban Expansion Element

- **Policy UE-1.1:** Designate Areas for New Urban Development That Recognize the Physical Characteristics and Environmental Constraints of the Planning Area.
- **Implementing Action 1.1.a:** Direct development away from significant concentrations of "Prime" agricultural soils and give priority to the conversion of non-prime agricultural land if reasonable alternatives exist.
- **Implementing Action 1.1.e:** Explore techniques to preserve areas of significant agricultural soils, aircraft noise and safety zones, buffers between cities, scenic areas, flood plains, endangered species habitats, etc. from incompatible urban development.

3.2.4 - Methodology

FCS evaluated potential project impacts on agricultural resources through site reconnaissance and review of FMMP maps, Williamson Act maps, project site plans, and applicable plans and policies. FCS evaluated the project's impacts on Important Farmland through the use of the LESA Model developed by the California Department of Conservation. The LESA model provides analytical approach for rating the relative quality of land resources based upon specific measurable features. Factors considered by the LESA Model include soils, site acreage, water availability, and surrounding land uses. Completion of the LESA Model included review of FMMP maps, Williamson Act maps, project site plans, and applicable plans and policies. The LESA Model worksheets are provided in Appendix B.

3.2.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether impacts to agricultural resources are significant environmental effects, the following questions are analyzed and evaluated.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural LESA Model prepared by the California Department

of Conservation as an optional model to use in assessing impacts on agriculture and farmland. The City of Merced uses the LESA Model along with other measures of soil quality to guide the impact determination, and it considers the conversion of "productive farmland" to be a significant impact. "Productive farmland" refers to farmland classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland under the California Department of Conservation's Farmland Mapping and Monitoring Program. As identified in Appendix G of the CEQA Guidelines, an impact would be considered significant if the project would:

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 § 12220(q), timberland (as defined by Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Government Code § 51104(g))? (Refer to Section 7, Effects Found not to be Significant.)

d) Result in the loss of forest land or conversion of forest land to non-forest use? (Refer to Section 7, Effects Found not to be Significant.)

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?

3.2.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Conversion of Farmland

Impact AG-1:	**The project would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.**

Impact Analysis

As indicated by the 2014 Merced County Important Farmland Map, there is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance mapped on the project site. As shown on Exhibit 3.2-1, the project site is designated as Farmland of Local Importance. As previously discussed, on-site soils are rated grade 1 (excellent) and grade 2 (good) by the Storie Index, and 4w (poor) and 4s (poor) by the NRCS Nonirrigated Capability Class. The availability and practicality of on-site irrigation is limited, and the existing Campus Parkway road further limits the site's use for field crops.

The project would convert approximately 77.5 acres of Farmland of Local Importance to commercial and residential uses. In summary, the project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. Impacts under this particular threshold criterion would be less than significant.

However, the CEQA Guidelines, Appendix G, Environmental Checklist Form states that when determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the LESA Model as an optional model to use in assessing impacts on agriculture and farmland. The LESA Model was developed to provide lead agencies with an optional methodology to ensure that potentially significant effects on the environment from agricultural land conversions are quantitatively and consistently considered in the environmental review process (Public Resources Code Section 21095), including during CEQA reviews. As a lead agency, the City of Merced utilizes the LESA Model to help evaluate the significance of agricultural land conversions.

The LESA Model evaluates and measures a project site's size, soil resource quality, water resource availability, surrounding agricultural lands (Exhibit 3.2-2), and surrounding protected resource lands (Exhibit 3.2-3). These factors are then rated, weighted, and combined, resulting in a single numeric score. This score becomes the basis for making a determination of significance for a project's potential impacts on agricultural resources.

As shown in Table 3.2-5, using the LESA Model, a project would result in a significant impact on agricultural resources depending on the resulting total LESA score.

Table 3.2-5: California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39 points	Not considered significant.
40 to 59 points	Considered significant only if LE and SA subscores are each greater than or equal to 20 points.
60 to 79 points	Considered significant unless either LE or SA subscores is less than 20 points.
80 to 100 points	Considered significant.
Source: California Department of Conservation 1997.	

The LESA Model includes a Land Evaluation (LE) scoring threshold and a Site Assessment (SA) scoring threshold. A single LESA score is generated for a project after all of the individual LE and SA factors have been scored and weighted. Scores are based on a scale of a maximum 100 points. The ratings determine whether a project would result in a significant impact on agricultural resources.

The LESA Model prepared for the proposed project, along with LESA Model worksheets, are included in this Draft EIR as Appendix B. The results are summarized in Table 3.2-6.

Table 3.2-6: Final LESA Score Sheet for the Project

Factor Name	Factor Scores	Factor Weight	Irrigated Weighted Factor Scores	Nonirrigated Weighted Factor Scores
LE Factors				
Land Capability Classification	80	0.25	20	10
Storie Index	80.58	0.25	20.15	20.15
LE Subscore		*0.50*	*40.15*	*30.15*
SA Factors				
Project Size	90	0.15	13.5	3
Water Resource Availability	80	0.15	12	6.75
Surrounding Agricultural Land	80	0.15	12	12
Surrounding Protected Resource Land	0	0.05	0	0
SA Subscore		*0.50*	*37.5*	*21.75*
Final LESA Score			**77.65**	**51.90**
Source: CalEEMod 2013.2.2 and First Carbon Solutions, 2015.				

The Final LESA Score for the project, as provided in Table 3.2-6, is 77.65 (irrigated) or 51.90 (nonirrigated). The project's total irrigated score is between 60 and 79 points, with the SA subscore and LE subscore each over 20. Therefore, based on LESA significance thresholds provided above in Table 3.2-6, project implementation would be considered a significant impact on agricultural resources. Based on the project's total nonirrigated score, which is between 40 and 59 points, with the SA subscore and LE subscore each over 20, project implementation would also be considered a significant impact on agricultural resources.

However, the City has previously recognized this significant environmental impact when it approved and adopted the Merced 2015 General Plan and certified the accompanying Merced 2015 General Plan EIR (General Plan EIR), as well as the Merced Vision 2030 General Plan and Merced Vision 2030 General Plan EIR. At the time the General Plan EIR was prepared, the project site was designated as Prime Farmland and Farmland of Statewide Importance. Since then, the on-site designations have been updated to Farmland of Local Importance, likely to reflect changing on-site uses and the urban designation of the project site.

As recognized in the General Plan EIR, adoption of the General Plan resulted in existing agricultural areas being re-designated for residential, commercial, and public land uses The General Plan included several policies and implementing actions to ensure that increased demand for additional land associated with an increase in population would minimize the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.

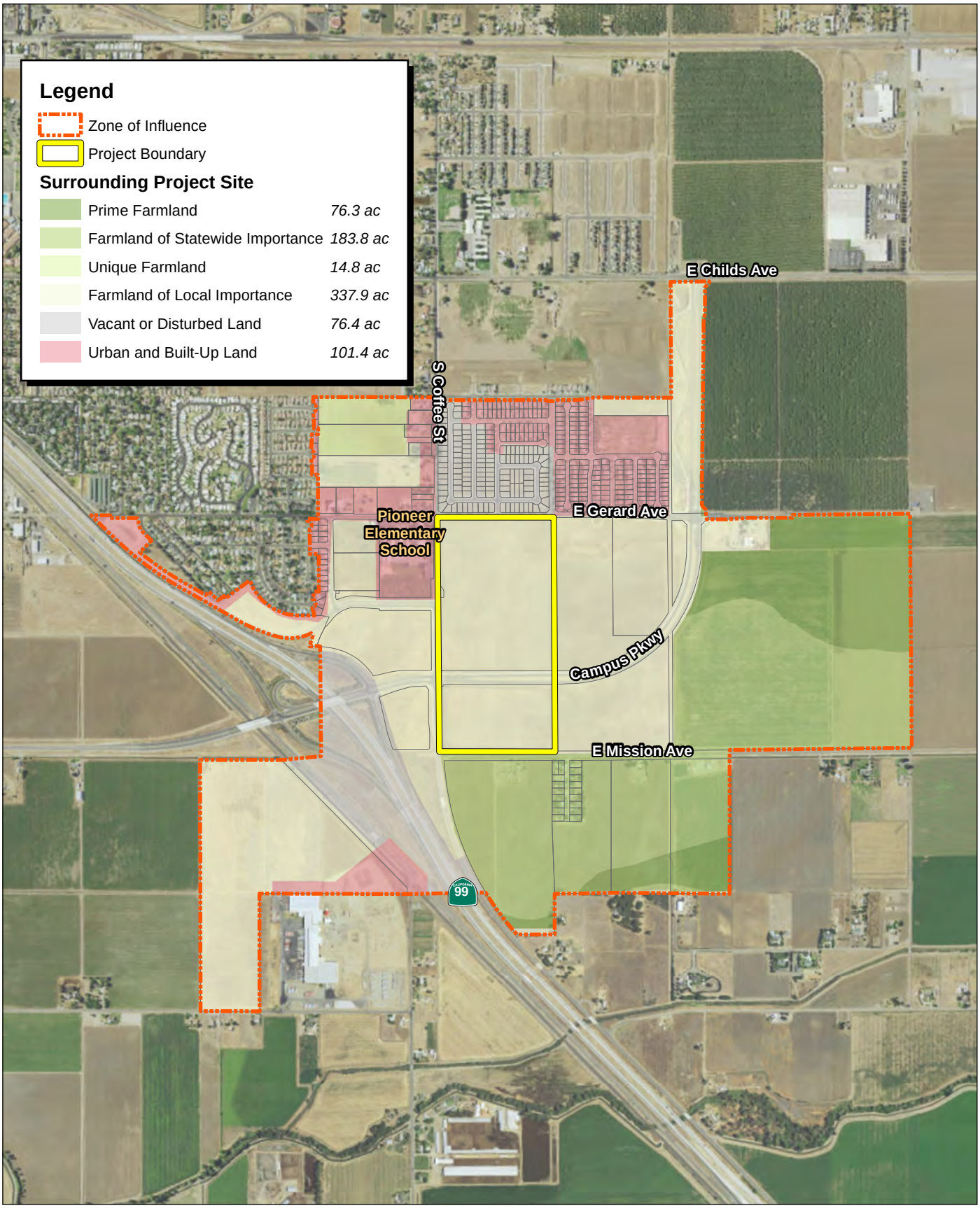
Source: ESRI Imagery, 2014; USDA 2014

FirstCarbon SOLUTIONS

1,000 500 0 1,000 Feet

Exhibit 3.2-2
USDA Soils Map

THIS PAGE INTENTIONALLY LEFT BLANK



Source: ESRI Imagery, FMMP, 2014

FirstCarbon SOLUTIONS

1,500 750 0 1,500 Feet

Exhibit 3.2-3
Zone of Influence

THIS PAGE INTENTIONALLY LEFT BLANK

The majority of these policies and implementing actions (as listed under Section 3.2.3, Regulatory Framework), require action of the City of Merced and do not apply directly to or require the direction action of individual developments. Despite the adoption of the policies and implementing actions, the General Plan EIR concluded that the conversion of Prime Farmland was considered a potentially significant impact, and that this impact would remain significant and unavoidable. The City adopted a Statement of Overriding Considerations to address this impact.

In summary, the loss of important farmland on the project site has already been accounted for by the City's General Plan EIR and associated Statement of Overriding Considerations. The City has designated and zoned the land for urban development, further indicating its long-range plan for the site's urban development and the loss of farmland. Therefore, because urban development of the site has been planned for and the proposed project is consistent with such planned development, impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Williamson Act or Farmland Zoning Conflict

Impact AG-2:	**The project would not conflict with existing zoning for agricultural use, or a Williamson Act contract.**

Impact Analysis

As indicated by the Fiscal Year 2013/2014 Merced County Williamson Act Map, the project site is not encumbered by a Williamson Act contract (California Department of Conservation 2014). As such, the project would not conflict with a Williamson Act contract.

The project site is designated as Regional Community Commercial and High to Medium Residential by the City of Merced General Plan and is zoned Central Commercial District (C-C) and Medium Density Residential (R-3-2). No part of the project site is currently zoned for agricultural use. As part of the project, General Plan amendments and zone changes would be made in order to reconfigure the boundary between the residential and commercial portions of the project site. A component of the project is to establish a Planned Development Zone with an accompanying Master Plan for the site that defines the overall site development concept. The Planned Development Zone would permit the development of up to 601,127 square feet of commercial uses and up to 178 multi-family dwelling units.

As such, the project would not conflict with existing agricultural zoning or a Williamson Act contract. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Other Changes Resulting in Farmland Conversion

Impact AG-3: **The project would not result in other changes in the existing environment, which, due to their location or nature, could result in the conversion of Farmland, to non-agricultural use.**

Impact Analysis

The project does not include changes to the physical existing environment, which, because of their location or nature could result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. The project site is located within the city limits and within the Sphere of Influence/Specific Urban Development Plan (SOI/SUDP). The development of the project is consistent with adjacent existing urban uses to the northeast and northwest of the project site. All surrounding undeveloped lands, including those currently used for agriculture are planned for urban development.

Underground storm drainage, water, sewer, electrical, and natural gas are located within adjacent roadways. The project would connect to these existing facilities and would not extend such facilities beyond existing limits, thereby encouraging urban development beyond the SOI/SUDP.

Future development of lands near the project site but outside the SOI/SUDP, including in areas used as farmland, would be restricted from conversion to urban uses through compliance with the City of Merced's urban expansion policies. As such, it is unlikely that the project would result in the conversion of adjacent farmlands to non-farmland uses. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

3.3 - Air Quality/Greenhouse Gas Emissions

This section describes the existing air quality and greenhouse gas setting and potential effects from project implementation on the sites and its surrounding area. The air quality and greenhouse gas analyses, including model output, are provided in Appendix C, Air Quality Calculations and Appendix G, GHG Calculations.

3.3.1 - Environmental Setting

The project is located in the San Joaquin Valley Air Basin (Air Basin). Regional and local air quality is impacted by topography, dominant airflows, atmospheric inversions, location, and season. The following section describes these conditions as they pertain to the Air Basin. The information in this section is primarily from the San Joaquin Valley Air Pollution Control District's (SJVAPCD's) Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) and the accompanying Technical Document (SJVAPCD 2015).

San Joaquin Valley Air Basin

Topography

The topography of a region is important for air quality because mountains can block airflow that would help disperse pollutants and can channel air from upwind areas that transports pollutants to downwind areas. The SJVAPCD covers the entirety of the Air Basin. The Air Basin is generally shaped like a bowl. It is open in the north and is surrounded by mountain ranges on all other sides. The Sierra Nevada mountains are along the eastern boundary (8,000 to 14,000 feet in elevation), the Coast Ranges are along the western boundary (3,000 feet in elevation), and the Tehachapi Mountains are along the southern boundary (6,000 to 8,000 feet in elevation).

Climate

The climate is important for air quality because of differences in the atmosphere's ability to trap pollutants close to the ground, creating adverse air quality, or to rapidly disperse pollutants over a wide area preventing high concentrations from accumulating under different climatic conditions. The Air Basin has an "inland Mediterranean" climate and is characterized by long, hot, dry summers and short, foggy winters. Sunlight can be a catalyst in the formation of some air pollutants (such as ozone); the Air Basin averages over 260 sunny days per year.

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Air Basin form natural horizontal barriers to the dispersion of air contaminants. The wind generally flows south-southeast through the valley, through the Tehachapi Pass and into the Southeast Desert Air Basin portion of Kern County. As the wind moves through the Air Basin, it mixes with the air pollution generated locally, generally transporting air pollutants from the north to the south in the summer and in a reverse flow in the winter.

Local Air Quality

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed,

wind direction, and air temperature inversions interact with the physical features of the landscape to determine the movement and dispersal of air pollutant emissions and, consequently, their effect on air quality.

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. Table 3.3-1 summarizes 2012 through 2014 published monitoring data, which is the most recent 3-year period available. The closest monitoring station to the project site is the Merced-S Coffee Avenue monitoring station. The table displays data from the Merced-S Coffee Avenue monitoring station (located approximately 0.1 mile northwest of the project site), the Merced M Street monitoring station (located approximately 3.2 miles northwest of the project site), and the Turlock-S Minaret Street monitoring station (located approximately 26.4 miles northwest of the project site). The data shows that during the past few years, the project area has exceeded the standards for ozone (state and national), PM_{10} (state), and $PM_{2.5}$ (state and national). The data in the table reflects the concentration of the pollutants in the air, measured using air monitoring equipment. This differs from emissions, which are calculations of a pollutant being emitted over a certain period. No recent monitoring data for Merced County or San Joaquin Valley Air Basin was available for sulfur dioxide (SO_2). Generally, no monitoring is conducted for pollutants that are no longer likely to exceed ambient air quality standards.

Table 3.3-1: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2012	2013	2014
Ozone[1]	1 Hour	Max 1 Hour (ppm)	**0.10**	**0.10**	**0.10**
		Days>State Standard (0.09 ppm)	**2**	**5**	**3**
	8 Hour	Max 8 Hour (ppm)	**0.086**	**0.092**	**0.088**
		Days>State Standard (0.07 ppm)	**25**	**31**	**44**
		Days>National Standard (0.075 ppm)	**9**	**15**	**22**
Carbon monoxide[2]	Maximum 1 Hour (ppm)[4]	Max 1 Hour (State) (20 ppm)	1.84	ID	ID
		Max 1 Hour (National) (35 ppm)	1.84	ID	ID
	8 Hour	Max 8 Hour (ppm)	1.29	ID	ID
		Days>State Standard (9.0 ppm)	0	0	0
		Days>National Standard (9 ppm)	0	0	0
Nitrogen dioxide (NO_2)[1]	Annual	Annual Average (ppm)	0.007	ID	ID
	1 Hour	Max 1 Hour (ppm)	0.043	0.052	0.054
		Days>State Standard (0.18 ppm)	0	0	0
		98^{th} Percentile of 1 hr Average (ppm)	0.039	0.040	0.044
Sulfur dioxide	Annual	Annual Average (ppm)	ND	ND	ND
	24 Hour	Max 24 Hour (ppm)	ND	ND	ND
		Days>State Standard (0.04 ppm)	ND	ND	ND

Table 3.3-1 (cont.): Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2012	2013	2014
Inhalable coarse particles (PM_{10})[3]	Annual	Annual Average (µg/m^3)	28.5	36.2	31.0
	24 hour	24 Hour (µg/m^3)	**89.4**	**80.5**	**92.7**
		Days>State Standard (50 µg/m^3)	ID	ID	ID
		Days>National Standard (150 µg/m^3)	0.0	0.0	0.0
Fine particulate matter ($PM_{2.5}$)[1]	Annual	Annual Average (µg/m^3) (National and State Standard 12.0 µg/m^3)	11.0	**13.3**	10.8
	24 Hour	24 Hour (µg/m^3)	**50.7**	**75.1**	**64.5**
		Days>National Standard (35 µg/m^3)	**8.6**	**16.1**	**17.0**

Notes:
[1] Merced-S Coffee Avenue
[2] Turlock-S Minaret Street station
[3] Merced-2334 M Street
[4] The ARB does not report 1-hour average CO concentrations in its database, only 8-hour CO concentrations. Therefore, the 1-hour CO concentration was derived by dividing the 8-hour concentration by 0.7.
>=exceed ppm=parts per million µg/m^3=micrograms per cubic meter
ID=insufficient data ND=no data max=maximum
Bold=exceedance
State Standard=California Ambient Air Quality Standard
National Standard=National Ambient Air Quality Standard
Source: California Air Resources Board 2015e.

Health Effects

The health impacts of the various air pollutants of concern can be presented in a number of ways. The clearest in comparison is to the state and federal ozone standards. If concentrations are below the standard, it is safe to say that no health impact would occur to anyone. When concentrations exceed the standard, impacts will vary based on the amount by which the standard is exceeded. The United States Environmental Protection Agency (EPA) developed the Air Quality Index (AQI) as an easy-to-understand measure of health impacts compared with concentrations in the air. Table 3.3-2 provides a description of the health impacts of ozone at different concentrations.

Table 3.3-2: Air Quality Index and Health Effects from Ozone

Air Quality Index/ 8-hour Ozone Concentration	Health Effects Description
AQI–100—Moderate	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 75 ppb	**Health Effects Statements**: Unusually sensitive individuals may experience respiratory symptoms.
	Cautionary Statements: Unusually sensitive people should consider limiting prolonged outdoor exertion.

Table 3.3-2 (cont.): Air Quality Index and Health Effects from Ozone

Air Quality Index/ 8-hour Ozone Concentration	Health Effects Description
AQI–150—Unhealthy for Sensitive Groups	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 95 ppb	**Health Effects Statements**: Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with respiratory disease, such as asthma.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
AQI–200—Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 115 ppb	**Health Effects Statements**: Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with respiratory disease, such as asthma; possible respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
AQI–210—Very Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 139 ppb	**Health Effects Statements**: Increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
Source: Air Now 2015.	

The highest reading at the Merced-S Coffee Avenue monitoring station was 92 parts per billion (ppb) in 2013 and based on the AQI scale for the 8-hour ozone standard, the Merced Station had as many as 100 days that were moderate (AQI 100) unhealthy over the last 3 years. In addition, Merced experienced no days in the last 3 years that would be categorized as either very unhealthy (AQI 210), unhealthful (AQI 200), or unhealthful for sensitive groups (AQI 150).

The other nonattainment pollutant of concern is $PM_{2.5}$. An AQI of 100 or lower is considered moderate and would be triggered by a 24-hour average concentration of 35.4 micrograms per cubic meter ($\mu g/m^3$), which is considered an exceedance of the federal $PM_{2.5}$ standard. The monitoring station nearest the project exceeded the standard on 41.7 days in the 3-year period spanning from 2012 to 2014. People with respiratory or heart disease, the elderly and children are the groups most

at risk. Unusually sensitive people should consider reducing prolonged or heavy exertion. The AQI of 150 is classified as unhealthful for sensitive groups with a $PM_{2.5}$ concentration of 55.4 µg/m^3. At this concentration, there is increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease, and in the elderly. People with respiratory or heart disease, the elderly, and children should limit prolonged exertion.

The highest concentration recorded by the Merced-S Coffee Avenue monitoring station was 75.1 µg/m^3 in 2013. At this concentration, increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly, and increased respiratory effects in general population would occur. People with respiratory or heart disease, the elderly, and children should avoid prolonged exertion; everyone else should limit prolonged exertion when the AQI exceeds this level.

Attainment Status

The EPA and the California Air Resources Board (ARB) designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards.

Each standard has a different definition, or "form" of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the 3-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

The current attainment designations for the San Joaquin Valley Air Basin are shown in Table 3.3-3. The Air Basin is designated as nonattainment for ozone (state and national), PM_{10} (state), and $PM_{2.5}$ (state and national).

Table 3.3-3: San Joaquin Valley Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone—One Hour	Nonattainment/Severe	No Standard
Ozone—Eight Hour	Nonattainment	Nonattainment/Extreme
Carbon monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen dioxide	Attainment	Attainment/Unclassified
Sulfur dioxide	Attainment	Attainment/Unclassified
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	No Designation/Classification
Source of State status: California Air Resources Board (ARB 2013a). Source of National status: U.S. Environmental Protection Agency (EPA 2013).		

Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as GHGs. The effect of these gases is analogous to the way a greenhouse retains heat, thus, the presence of GHGs in the atmosphere affects the earth's atmosphere. Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. GHGs are emitted by both natural processes and human activities. However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of GHGs in the atmosphere beyond the level of naturally occurring concentrations.

Certain gases in the atmosphere block heat from escaping. Long-lived gases that remain semi-permanently in the atmosphere and do not respond physically or chemically to changes in temperature are described as "forcing" climate change. Gases such as water vapor, which respond physically or chemically to changes in temperature, are seen as "feedbacks" (NASA 2015).

The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. Individual GHG compounds have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential of one. The global warming potential of a GHG is a measure of how much a given mass of a GHG is estimated to contribute to global warming. To describe how much global warming a given type and amount of GHG may cause, the carbon dioxide equivalent is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent reference gas, carbon dioxide. For example, methane's warming potential of 21 indicates that methane has 21 times greater warming affect than carbon dioxide on a molecule per molecule basis. A carbon dioxide equivalent is the mass emissions of an individual GHG multiplied by its global warming potential. GHGs defined by Assembly Bill (AB) 32 (see the Climate Change Regulatory Environment section for a description) include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. A seventh GHG, nitrogen trifluoride (NF_3), was recently added to Health and Safety Code section 38505(g)(7) as a GHG of concern. These GHGs are described in Table 3.3-4.

Table 3.3-4: Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (laughing gas) is a colorless GHG. It has a lifetime of 114 years. Its global warming potential is 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 21.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural GHG. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.

Table 3.3-4 (cont.): Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Chlorofluorocarbons	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987.
Hydrofluorocarbons	Hydrofluorocarbons are a group of GHGs containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Sources: Compiled from a variety of sources, primarily Intergovernmental Panel on Climate Change 2007a and 2007b.		

Several other gases and black carbon are considered GHGs but are not currently defined by the IPCC as such. A description of these items and the reasons they are not part of the GHG analysis is provided below.

The State has begun the process of addressing pollutants referred to as short-lived climate pollutants. According to ARB, short-lived climate pollutants are powerful climate forcers that remain in the atmosphere for a much shorter period of time than longer-lived climate pollutants, such as carbon dioxide (CO_2). Their relative potency, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2. Reducing these emissions can make an immediate beneficial impact on climate change (ARB 2015a). Senate Bill 605, approved by the Governor on September 14, 2014, requires the ARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016. ARB will complete an emission inventory of these pollutants, identify research needs, identify existing and potential new control measures that offer co-benefits, and coordinate with other state agencies and districts to develop measures.

The short-lived climate pollutants include three main components: black carbon, fluorinated gases, and methane. Fluorinated gases and methane are described in Table 2-1 and are already included in the California GHG inventory. Black carbon has not been included in past GHG inventories; however, ARB will include it in its comprehensive strategy (ARB 2015a).

Ozone is another short-lived climate pollutant that will be part of the strategy. Ozone affects evaporation rates, cloud formation, and precipitation levels. Ozone is not directly emitted so its precursor emissions volatile organic compounds (VOC) and oxides of nitrogen (NO_x) on a regional scale and CH_4 on a hemispheric scale will be subject of the strategy (ARB 2015b).

Black carbon is a component of fine particulate matter. Black carbon is formed by incomplete combustion of fossil fuels, biofuels, and biomass. Sources of black carbon within a jurisdiction may include exhaust from diesel trucks, vehicles, and equipment, as well as smoke from biogenic combustion. Biogenic combustion sources of black carbon include the burning of biofuels used for transportation, the burning of biomass for electricity generation and heating, prescribed burning of agricultural residue, and natural and unnatural wildfires. Black carbon is not a gas but an aerosol; it comprises particles or liquid droplets suspended in air. Black carbon only remains in the atmosphere for days to weeks, in contrast to other GHGs that can remain in the atmosphere for years. Black carbon can be deposited on snow, where it absorbs sunlight, reduces sunlight reflectivity, and hastens snowmelt. Direct effects include absorption of incoming and outgoing radiation; indirectly, black carbon can also affect cloud reflectivity, precipitation, and surface dimming (cooling).

Global warming potentials for black carbon were not defined by the IPCC in its Fourth Assessment Report. The ARB has identified a global warming potential of 3,200 using a 20-year time horizon and 900 using a 100-year time horizon from the IPCC Fifth Assessment. Sources of black carbon are already regulated by ARB, and by air district criteria pollutant and toxic air contaminant (TAC) regulations that control fine particulate emissions from diesel engines and other combustion sources (ARB 2015). Additional controls on the sources of black carbon specifically for their GHG impacts beyond those required for toxic and fine particulates are not likely to be needed.

Water vapor is also considered a GHG. Water vapor is an important component of our climate system and is not regulated. Increasing water vapor leads to warmer temperatures, which causes more water vapor to be absorbed into the air. Warming and water absorption increase in a spiraling cycle. Water vapor feedback can also amplify the warming effect of other greenhouse gases, such that the warming brought about by increased carbon dioxide allows more water vapor to enter the atmosphere (NASA 2015).

Human Health Effects of GHG Emissions

Greenhouse gas emissions from development projects would not result in concentrations that would directly impact public health. However, the cumulative effects of GHG emissions on climate change have the potential to cause adverse effects to human health.

The U.S. Global Change Research Program, in its report, Global Climate Change Impacts in the U.S. (2009), has analyzed the degree to which impacts on human health are expected to impact the United States.

Potential effects of climate change on public health include:

- Direct Temperature Effects: Climate change may directly affect human health through increases in average temperatures, which are predicted to increase the incidence of heat waves and hot extremes.
- Extreme Events: Climate change may affect the frequency and severity of extreme weather events, such as hurricanes and extreme heat and floods, which can be destructive to human health and well-being.
- Climate–Sensitive Diseases: Climate change may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas and are spread by mosquitoes and other insects, such as malaria, dengue fever, yellow fever, and encephalitis.
- Air Quality: Respiratory disorders may be exacerbated by warming-induced increases in the frequency of smog (ground-level ozone) events and particulate air pollution (EPA 2009a).

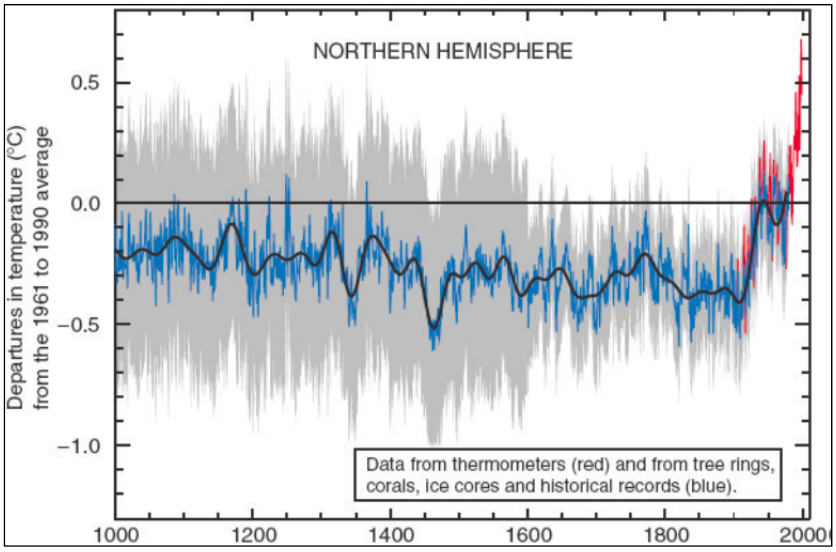
Although there could be health effects resulting from changes in the climate and the consequences that can occur, inhalation of GHGs at levels currently in the atmosphere would not result in adverse health effects, with the exception of ozone and aerosols (particulate matter). The potential health effects of ozone and particulate matter are discussed in criteria pollutant analyses. At very high indoor concentrations (not at levels existing outside), CO_2, CH_4, sulfur hexafluoride, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen (CDC 2010 and OSHA 2003).

Climate Change

Climate change is a change in the average weather of the earth that is measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Fourth Assessment Report, the IPCC predicted that the global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios (IPCC 2007a). The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations." Figure 1 provides a graph of historical temperature change.

Figure 1: Historical Temperature Changes



Source: IPCC 2001

Consequences of Climate Change in California

In California, climate change may result in consequences such as the following (from CCCC 2006 and Moser et al. 2009).

- **A reduction in the quality and supply of water from the Sierra snowpack.** If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. This can lead to challenges in securing adequate water supplies. It can also lead to a potential reduction in hydropower.
- **Increased risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- **Reductions in the quality and quantity of certain agricultural products.** The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- **Exacerbation of air quality problems.** If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.
- **A rise in sea levels resulting in the displacement of coastal businesses and residences.** During the past century, sea levels along California's coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming

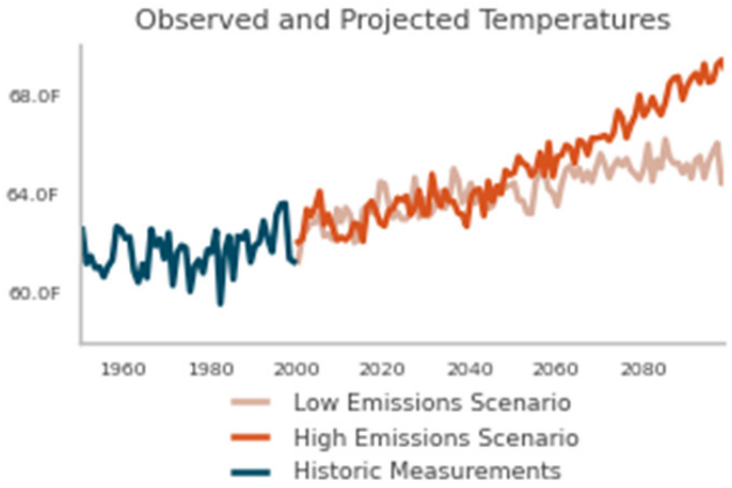
range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

- **An increase temperature and extreme weather events.** Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.
- **A decrease in the health and productivity of California's forests.** Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

Consequences of Climate Change in the Merced Area

Figure 2 displays a chart of measured historical and projected annual average temperatures in the Merced area. As shown in the figure, temperatures are expected to rise in the low and high GHG emissions scenarios. The results indicate that temperatures are predicted to increase by 3.6 degrees Fahrenheit under the low emission scenario and 6.3 degrees F under the high emissions scenario between a baseline time period (1961–1990) and an end-of-century period (2070–2090) (CalAdapt 2015).

Figure 2: Observed and Projected Temperatures for Climate Change in the Merced Area



Source: CalAdapt 2015

3.3.2 - Regulatory Framework

Criteria Pollutants

Air pollutants are regulated at the national, state, and air basin level; each agency has a different level of regulatory responsibility. The EPA regulates at the national level. The EPA regulates at the national level. The ARB regulates at the state level. The SJVAPCD regulates at the air basin level.

Federal and State

The EPA is responsible for national and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards, also known as federal standards. There are federal standards for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act of 1970. The criteria pollutants are:

- Ozone
- Nitrogen dioxide
- Lead
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide

The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The State Implementation Plan for the State of California is administered by the ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California's State Implementation Plan incorporates individual federal attainment plans for regional air districts—air district prepares their federal attainment plan, which is sent to ARB to be approved and incorporated into the California State Implementation Plan. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

The ARB also administers California Ambient Air Quality Standards (state standards) for the 10 air pollutants designated in the California Clean Air Act. The 10 state air pollutants are the six federal standards listed above as well visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The federal and state ambient air quality standards, relevant effects, properties, and sources of the pollutants are summarized in Table 3.3-5.

Table 3.3-5: Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Ozone	1 Hour	0.09 ppm	—	Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage.	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), NO_x, and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO_x) are mobile sources (on-road and off-road vehicle exhaust).
	8 Hour	0.070 ppm	0.070 ppm[f]			
Carbon monoxide (CO)	1 Hour	20 ppm	35 ppm	Ranges depending on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death.	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.
	8 Hour	9.0 ppm	9 ppm			
Nitrogen dioxide[b] (NO_2)	1 Hour	0.18 ppm	0.100 ppm	Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contribution to atmospheric discoloration; increased visits to hospital for respiratory illnesses.	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides—NO_x (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). NO_x is a precursor to ozone, PM_{10}, and $PM_{2.5}$ formation. NO_x can react with compounds to form nitric acid and related small particles and result in PM related health effects.	NO_x is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Nitrogen dioxide (NO_2) forms quickly from NO_x emissions. NO_2 concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.
	Annual	0.030 ppm	0.053 ppm			

Table 3.3-5 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfur dioxide[c] (SO_2)	1 Hour	0.25 ppm	0.075 ppm	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO_x) include sulfur dioxide and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although sulfur dioxide concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and PM_{10}.	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The sulfur dioxide levels in the State are well below the maximum standards.
	3 Hour	—	0.5 ppm			
	24 Hour	0.04 ppm	0.14 (for certain areas)			
	Annual	—	0.030 ppm (for certain areas)			
Particulate matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	• Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravate existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. • Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is between 2.5 and 10 microns in diameter, (1 micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair.	Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere.
	Mean	20 µg/m^3	—			
Particulate matter ($PM_{2.5}$)	24 Hour	—	35 µg/m^3			
	Annual	12 µg/m^3	12.0 µg/m^3			
Visibility-reducing particles	8 Hour	See note below[d]				

Table 3.3-5 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfates	24 Hour	25 µg/m^3	—	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.	The sulfate ion is a polyatomic anion with the empirical formula SO_4^{2-}. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of sulfur dioxide. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.
Lead[e]	30-day	1.5 µg/m^3	—	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs.	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.
	Quarter	—	1.5 µg/m^3			
	Rolling 3-month average	—	0.15 µg/m^3			
Vinyl chloride[e]	24 Hour	0.01 ppm	—	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a TAC and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.
Hydrogen sulfide	1 Hour	0.03 ppm	—	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and	Hydrogen sulfide (H_2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary

Table 3.3-5 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
				respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.		sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal).
Volatile organic compounds (VOC)		There are no State or federal standards for VOCs because they are not classified as criteria pollutants.		Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as TACs.	Reactive organic gases (ROG), or VOCs, are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROG and VOCs, the two terms are often used interchangeably.	Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.
Diesel particulate matter (DPM)		There are no ambient air quality standards for DPM.		Some short-term (acute) effects of DPM exposure include eye, nose, throat, and lung irritation, coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.	DPM is a source of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust.	Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Typically, the main source of DPM is from combustion of diesel fuel in diesel-powered engines. Such engines are in on-road vehicles such as diesel trucks, off-road construction vehicles, diesel electrical generators, and various pieces of stationary construction equipment.

Table 3.3-5 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources

Notes:
ppm=parts per million (concentration) µg/m^3=micrograms per cubic meter Annual=Annual Arithmetic Mean 30-day=30-day average Quarter=Calendar quarter

[a] Federal standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3 Hour SO_2, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[b] To attain the 1-hour NO_2 national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (0.100 ppm).

[c] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[d] Visibility-reducing particles: In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

[e] The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[f] On October 1, 2015, the EPA strengthened the NAAQS for ground-level ozone to 70 parts per million (ppm) through the adoption of a new standard (Docket No. EPA–HQ–OAR–2008-0699). The Final Rule went into effect on December 28, 2015.

Source of effects, properties, and sources: South Coast Air Quality Management District 2007; California Environmental Protection Agency 2002; California Air Resources Board 2009; U.S. Environmental Protection Agency 2003, 2009a, 2009b, 2012a, 2012b, and 2013; National Toxicology Program 2014a and 2014b.
Source of standards: California Air Resources Board 2013.

Asbestos

Asbestos is listed as a TAC by ARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in surface deposits of several types of rock formations. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Crushing or breaking these rocks, through construction or other means, can release asbestoform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma.

According to the General Location Guide for Ultramafic Rocks in California (California Division of Mines and Geology, 2000), the nearest likely location of naturally occurring asbestos to the project site is located approximately 28 miles to the northeast in the foothills located near the town of Mariposa. Because of the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

State of California

Low-Emission Vehicle Program

The ARB first adopted Low-Emission Vehicle (LEV) program standards in 1990. These first LEV standards ran from 1994 through 2003. LEV II regulations, running from 2004 through 2010, represent continuing progress in emission reductions. As the State's passenger vehicle fleet continues to grow and more sport utility vehicles and pickup trucks are used as passenger cars rather than work vehicles, the more stringent LEV II standards were adopted to provide reductions necessary for California to meet federally mandated clean air goals outlined in the 1994 State Implementation Plan. In 2012, ARB adopted the LEV III amendments to California's Low-Emission Vehicle (LEV) regulations. These amendments include more stringent emission standards for both criteria pollutants and GHGs for new passenger vehicles (ARB 2012a).

On-Road Heavy-Duty Vehicle Program

The ARB has adopted standards for emissions from various types of new on-road heavy-duty vehicles. Section 1956.8, Title 13, California Code of Regulations contains California's emission standards for on-road heavy-duty engines and vehicles, and test procedures. ARB has also adopted programs to reduce emissions from in-use heavy-duty vehicles including the Heavy-Duty Diesel Vehicle Idling Reduction Program, the Heavy-Duty Diesel In-Use Compliance Program, the Public Bus Fleet Rule and Engine Standards, and the School Bus Program and others (ARB 2013b).

ARB Regulation for In-Use Off-Road Diesel Vehicles

On July 26, 2007, the ARB adopted a regulation to reduce DPM and nitrous oxides (NO_x) emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. The ARB is enforcing that part of the rule with fines up to $10,000 per day for each

vehicle in violation. Performance requirements of the rule are based on a fleet's average NO_x emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements, making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

ARB Airborne Toxic Control Measure for Asbestos

In July 2001, the ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of best management practices to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities. The measure establishes specific testing, notification and engineering controls prior to grading, quarrying, or surface mining in construction zones where naturally occurring asbestos is located on projects of any size. There are additional notification and engineering controls at work sites larger than one acre in size. These projects require the submittal of a "Dust Mitigation Plan" and approval by the air district prior to the start of a project.

Construction sometimes requires the demolition of existing buildings where construction occurs. Buildings often include materials containing asbestos, but no demolition is associated with this project. However, asbestos is also found in a natural state, known as naturally occurring asbestos. Exposure and disturbance of rock and soil that naturally contain asbestos can result in the release of fibers into the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

The ARB has an Air Toxics Control Measure for construction, grading, quarrying, and surface mining operations, requiring the implementation of mitigation measures to minimize emissions of asbestos-laden dust. The measure applies to road construction and maintenance, construction and grading operations, and quarries and surface mines when the activity occurs in an area where naturally occurring asbestos is likely to be found. Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The measure also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity. Review of the Department of Conservation maps indicates that no ultramafic rock has been found near Merced.

Diesel Risk Reduction Plan

The ARB's Diesel Risk Reduction Plan has led to the adoption of new state regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce DPM emissions by about 90 percent overall from year 2000 levels. The projected emission benefits associated with

the full implementation of this plan, including federal measures, are reductions in DPM emissions and associated cancer risks of 75 percent by 2010, and 85 percent by 2020 (ARB 2000).

San Joaquin Valley Air Pollution Control District

The District is responsible for controlling emissions primarily from stationary sources. The District, in coordination with the eight countywide transportation agencies, is also responsible for developing, updating, and implementing air quality attainment plans for the Air Basin. The District also has roles under CEQA.

Ozone Plans

The Air Basin is designated nonattainment of state and federal health-based air quality standards for ozone. To meet Clean Air Act requirements for the one-hour ozone standard, the District adopted an Extreme Ozone Attainment Demonstration Plan in 2004, with an attainment date of 2010. Although the EPA revoked the federal 1-hour ozone standard effective June 15, 2005 and replaced it with an 8-hour standard, the requirement to submit a plan for that standard remained in effect for the San Joaquin Valley.

The planning requirements for the 1-hour plan remain in effect until replaced by a federal 8-hour ozone attainment plan. The EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan, including revisions to the plan, on March 8, 2010, effective April 7, 2010. However, the Air Basin failed to attain the standard in 2010 and was subject to a $29-million Clean Air Act penalty. The penalty is being collected through an additional $12 motor vehicle registration surcharge for each passenger vehicle registered in the Air Basin that will be applied to pollution reduction programs in the region. The District also instituted a more robust ozone episodic program to reduce emissions on days with the potential to exceed the ozone standards.

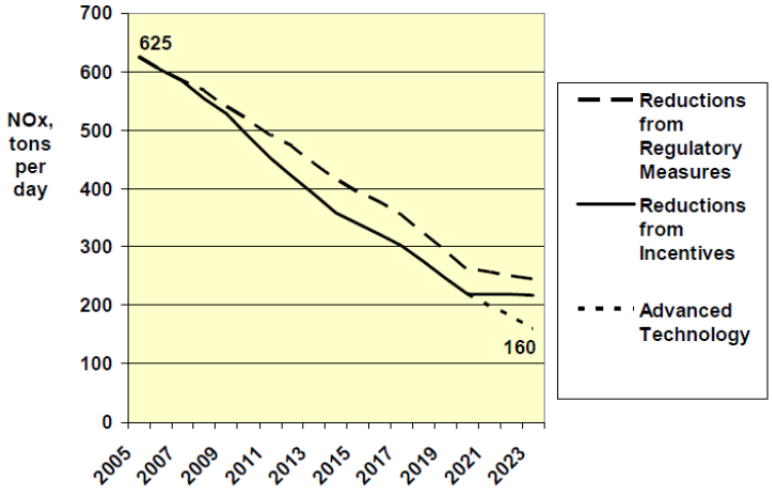
The EPA originally classified the Air Basin as serious nonattainment for the 1997 federal 8-hour ozone standard with an attainment date of 2013. On April 30, 2007, the District's Governing Board adopted the 2007 Ozone Plan, which contained analysis showing a 2013 attainment target to be infeasible. The 2007 Ozone Plan details the plan for achieving attainment on schedule with an "extreme nonattainment" deadline of 2024. At its adoption of the 2007 Ozone Plan, the District also requested a reclassification to extreme nonattainment. ARB approved the plan in June 2007, and the EPA approved the request for reclassification to extreme nonattainment on April 15, 2010.

The 2007 Ozone Plan contains measures to reduce ozone and particulate matter precursor emissions to bring the Basin into attainment with the federal 8-hour ozone standard. The 2007 Ozone Plan calls for a 75-percent reduction of NO_x and a 25-percent reduction of reactive organic gases (ROG). Figure 3 displays the anticipated NO_x reductions attributed in the 2007 Ozone Plan (Source: 2007 Ozone Plan). The plan, with innovative measures and a "dual path" strategy, assures expeditious attainment of the federal 8-hour ozone standard for all Air Basin residents. The District Governing Board adopted the 2007 Ozone Plan on April 30, 2007. The ARB approved the plan on June 14, 2007. The 2007 Ozone Plan requires yet to be determined "Advanced Technology" to achieve additional reductions after 2021, in order to attain the standard at all monitoring stations in the Air Basin by 2024 as allowed for areas designated extreme nonattainment by the federal Clean Air Act (CAA).

The Air Basin is designated as an extreme ozone nonattainment area for the EPA's 2008 8-hour ozone standard. The plan to address this standard is expected to be due to the EPA in 2015/2016.

State ozone standards do not have an attainment deadline but require implementation of all feasible measures to achieve attainment at the earliest date possible. This is achieved through compliance with the federal deadlines and control measure requirements.

Figure 3: San Joaquin Valley NO_x Emissions Forecast



Particulate Matter Plans

The Air Basin was designated nonattainment of state and federal health-based air quality standards for PM_{10}. The Air Basin is also designated nonattainment of state and federal standards for $PM_{2.5}$.

To meet Clean Air Act requirements for the PM_{10} standard, the District adopted a PM_{10} Attainment Demonstration Plan (Amended 2003 PM_{10} Plan and 2006 PM_{10} Plan), which has an attainment date of 2010. The District adopted the 2007 PM_{10} Maintenance Plan in September 2007 to assure the San Joaquin Valley's continued attainment of the EPA's PM_{10} standard. The EPA designated the valley as an attainment/maintenance area for PM_{10} on September 25, 2008. Although the San Joaquin Valley has exceeded the standard since then, those days were considered exceptional events that are not considered a violation of the standard for attainment purposes.

The 2008 $PM_{2.5}$ Plan builds upon the comprehensive strategy adopted in the 2007 Ozone Plan to bring the Air Basin into attainment of the 1997 national standards for $PM_{2.5}$. The EPA has identified NO_x and sulfur dioxide as precursors that must be addressed in air quality plans for the 1997 $PM_{2.5}$ standards. The 2008 $PM_{2.5}$ Plan is a continuation of the District's strategy to improve the air quality in the Air Basin. The EPA issued final approval of the 2008 $PM_{2.5}$ Plan on November 9, 2011, which became effective on January 9, 2012. The EPA approved the emissions inventory, the reasonably available control measures/reasonably available control technology demonstration, reasonable further progress demonstration, attainment demonstration and associated air quality modeling, and the transportation conformity motor vehicle emissions budgets. The EPA also granted California's request to extend the attainment deadline for the San Joaquin Valley to April 5, 2015 and approved

commitments to measures and reductions by the District and the ARB. Finally, it disapproved the State Implementation Plan's contingency provisions and issued a protective finding for transportation conformity determinations.

In December 2012, the District adopted the 2012 $PM_{2.5}$ Plan to bring the San Joaquin Valley into attainment of the EPA's 2006 24-hour $PM_{2.5}$ standard of 35 micrograms per cubic meter ($\mu g/m^3$). The ARB approved the District's 2012 $PM_{2.5}$ Plan for the 2006 standard at a public hearing on January 24, 2013 (SJVAPCD 2012a). This plan seeks to bring the Valley into attainment with the standard by 2019, with the expectation that most areas will achieve attainment before that time.

The 2015 Plan for the 1997 $PM_{2.5}$ Standard, approved by the District Governing Board on April 16, 2015, will bring the Valley into attainment of EPA's 1997 $PM_{2.5}$ standard as expeditiously as practicable, but no later than December 31, 2020. The plan was required to request reclassification to Serious nonattainment and to extend the attainment date from 2018 to 2020 (SJVAPCD 2015).

SJVAPCD Rules and Regulations

The SJVAPCD rules and regulations that may apply to projects that will occur during buildout of the project include, but are not limited to the following:

- **Rule 4102—Nuisance**. The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.
- **Rule 4601—Architectural Coatings**. The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling.
- **Rule 4641—**Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.
- **Rule 4901—Wood Burning Fireplaces and Wood Burning Heaters**. The purposes of this rule are to limit emissions of carbon monoxide and particulate matter from wood burning fireplaces, wood burning heaters, and outdoor wood burning devices, and to establish a public education program to reduce wood burning emissions. All development that includes woodburning devices are subject to this rule.
- **Regulation VIII—Fugitive PM_{10} Prohibitions**. Rules 8011-8081 are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules.
- **Rule 9510—Indirect Source Review**. This rule reduces the impact of NO_x and PM_{10} emissions from growth within the Air Basin. The rule places application and emission reduction requirements on development projects meeting applicability criteria in order to reduce

emissions through on-site mitigation, off-site District-administered projects, or a combination of the two. This project must comply with Rule 9510 because it would develop more than 50 residential dwelling units and more than 2,000 square feet of commercial space.

CEQA

The District has three roles under CEQA:

1. *Lead Agency*: Responsible for preparing environmental analyses for its own projects (adoption of rules, regulations, or plans) or permit projects filed with the District where the District has primary approval authority over the project.
2. *Responsible Agency*: The discretionary authority of a Responsible Agency is more limited than a Lead Agency; having responsibility for mitigating or avoiding only the environmental effects of those parts of the project which it decides to approve, carry out, or finance. The District defers to the Lead Agency for preparation of environmental documents for land use projects that also have discretionary air quality permits, unless no document is prepared by the Lead Agency and potentially significant impacts related to the permit are possible. The District regularly submits comments on documents prepared by Lead Agencies to ensure that District concerns are addressed.
3. *Commenting Agency*: The District reviews and comments on air quality analyses prepared by other public agencies (such as the project).

The District also provides guidance and thresholds for CEQA air quality and GHG analyses. The result of this guidance, as well as state regulations to control air pollution, is an overall improvement in the Air Basin. In particular, the District's 2015 GAMAQI states the following:

1. The District's Air Quality Attainment Plans include measures to promote air quality elements in county and city general plans as one of the primary indirect source programs. The general plan is the primary long range planning document used by cities and counties to direct development. Since air districts have no authority over land use decisions, it is up to cities and counties to ensure that their general plans help achieve air quality goals. Section 65302.1 of the California Government Code requires cities and counties in the San Joaquin Valley to amend appropriate elements of their general plans to include data, analysis, comprehensive goals, policies, and feasible implementation strategies to improve air quality in their next housing element revisions.
2. The Air Quality Guidelines for General Plans (AQGGP), adopted by the District in 1994 and amended in 2005, is a guidance document containing goals and policy examples that cities and counties may want to incorporate into their General Plans to satisfy Section 65302.1. When adopted in a general plan and implemented, the suggestions in the AQGGP can reduce vehicle trips and miles traveled and improve air quality. The specific suggestions in the AQGGP are voluntary. The District strongly encourages cities and counties to use their land use and transportation planning authority to help achieve air quality goals by adopting the suggested policies and programs.

Greenhouse Gas Emissions

The regulatory environment discussion helps to provide a context for the project's impact in relation to regulations and programs in place to address the impact by the various levels of government with responsibility for the issue. Climate change is a global issue resulting from the cumulative GHG emissions from sources throughout the world, making international action necessary. California has taken a leadership role in GHG regulations at the state level in the United States. Air pollution control districts have responsibilities for regulating local stationary sources of GHG emissions and for providing guidance utilizing their expertise in regulating other air pollutants. Cities and Counties are responsible for impacts from GHG emissions from their own activities and in a CEQA context for land use projects. A discussion of each level of regulation is provided in this section.

International

International organizations such as the ones discussed below have made substantial efforts to reduce GHGs. Preventing human induced climate change will require the participation of all nations in solutions to address the issue.

Intergovernmental Panel on Climate Change (IPCC). In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations Framework Convention on Climate Change (Convention). On March 21, 1994, the United States joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

Kyoto Protocol. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas emissions an average of 5 percent against 1990 levels over the five-year period 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

In 2001, former President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2°C above pre-industrial levels, subject to a review in 2015. The UN Climate Change Committee held additional meetings in Durban, South Africa in November

2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings are gradually gaining consensus among participants on individual climate change issues.

On September 23, 2014, more than 100 Heads of State and Government and leaders from the private sector and civil society met at the Climate Summit in New York hosted by the United Nations. At the Climate Summit, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience. Government leaders also committed to reach an ambitious and universal climate agreement for adoption in a meeting scheduled in Paris for December 2015 and pledged to work under the UN Framework Convention on Climate Change to reach it.

National

Prior to the last decade, there were no concrete federal regulations of GHGs or major planning for climate change adaptation. Since then, federal activity has increased. The following are actions regarding the federal government, GHGs, and fuel efficiency.

Greenhouse Gas Endangerment. In *Massachusetts v. EPA* (Supreme Court Case 05-1120) decided on April 2, 2007, the Supreme Court found that four GHGs, including CO_2 are air pollutants subject to regulation under Section 202(a)(1)of the Clean Air Act. The Court held that the EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, the findings were a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section "Clean Vehicles" below. After a lengthy legal challenge the Supreme Court declined to review an Appeals Court ruling upholding the finding (EPA 2009b).

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards would cut carbon dioxide emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the National Highway Safety Administration issued final rules on a second-phase joint rulemaking establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012 (EPA 2012). The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium duty passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO_2 in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, effective November 14, 2011. For combination tractors, the agencies proposed engine and vehicle standards that began in the 2014 model year and achieve up to a 20-percent reduction in carbon dioxide emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies proposed separate gasoline and diesel truck standards, which phased in beginning in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles and a 15-percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10-percent reduction in fuel consumption and carbon dioxide emissions from the 2014 to 2018 model years.

Mandatory Reporting of Greenhouse Gases. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010 that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these Clean Air Act permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the federal code of regulations, EPA states:

> This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing

> the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to greenhouse gas sources, starting with the largest greenhouse gas emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for greenhouse gas emissions until at least April 30, 2016 (EPA 2010).

EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of carbon dioxide for new affected fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatt would be required to meet an output based standard of 1,000 pounds of carbon dioxide per megawatt-hour, based on the performance of widely used natural gas combined cycle technology.

Cap and Trade. Cap and trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. Successful examples in the United States include the Acid Rain Program and the NO_x Budget Trading Program in the northeast. There is no federal cap and trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap and trade.

The Regional Greenhouse Gas Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps carbon dioxide emissions from power plants, auctions carbon dioxide emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners were originally California, British Columbia, Manitoba, Ontario, and Quebec. However, Manitoba and Ontario are not currently participating. California linked with Quebec's cap and trade system on January 1, 2014 and joint offset auctions have taken place in 2015 (C2ES 2015).

State of California

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark AB 32 California Global Warming Solutions Act of 2006 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other

purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

AB 32. The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 was signed by Governor Schwarzenegger on September 27, 2006. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "Greenhouse gases" as defined under AB 32 include carbon dioxide, methane, NO_x, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The ARB is the state agency charged with monitoring and regulating sources of GHGs in California. AB 32 Findings and Declarations states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

The ARB approved the 1990 GHG emissions level of 427 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) on December 6, 2007 (ARB 2007). Therefore, to meet the State's target, emissions generated in California in 2020 are required to be equal to or less than 427 $MMTCO_2e$. Emissions in 2020 (if emissions were permitted to grow at projected rates without regulatory reductions) were estimated to be 596 $MMTCO_2e$ (ARB 2008a). At that rate, a 28.3 percent reduction was required to achieve the 427 $MMTCO_2e$ 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the effects of the 2008 recession and slower forecasted growth. The 2020 inventory without the benefits of adopted regulation is now estimated at 545 $MMTCO_2e$. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels (ARB 2010a).

Progress in Achieving AB 32 Targets and Remaining Reductions Required

The State has made steady progress in implementing AB 32 and achieving targets included in Executive Order S-3-05. The progress is shown in updated emission inventories for 2000 through 2012 (ARB 2014a). The State has achieved the Executive Order S-3-05 target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target. Also shown are the average reductions needed from all statewide sources (including all existing sources) to reduce GHG emissions back to 1990 levels to achieve the AB 32 target.

- 1990: 427 $MMTCO_2e$ (AB 32 2020 target)
- 2000: 463 $MMTCO_2e$ (an average 8-percent reduction from 2000 needed to achieve 1990 base)
- 2010: 450 $MMTCO_2e$ (an average 5-percent reduction needed to achieve 1990 base)

As described earlier in this section, 2010: 450 $MMTCO_2e$ (an average 5-percent reduction needed to achieve 1990 base) ARB revised the 2020 BAU inventory forecast to account for new lower growth

projections which resulted in a new lower reduction from BAU to achieve the 1990 base. The previous reduction from 2020 BAU needed to achieve 1990 levels was 28.3 percent and the latest reduction from 2020 BAU is 21.7 percent.

- 2020: 545 $MMTCO_2e$ BAU forecast (an average 21.7-percent reduction from BAU needed to achieve 1990 base)

Under AB 32, the ARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. The measures were enforceable by January 1, 2010. The 44 early action measures apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. ARB has completed regulations implementing all Early Action Measures. The ARB estimated that the 44 recommendations will result in reductions of at least 42 $MMTCO_2e$ by 2020, representing approximately 25 percent of the 2020 target. The Early Action Measures are complete.

ARB Scoping Plan. The ARB's Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to achieve the targets established by AB 32 (ARB 2008a). The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target. Each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. Capped strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the cap-and trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient

amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional GHG emission reductions.

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update identifies the next steps for California's climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 GHG limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities Climate for the next several years. The Update does not set new targets for the State, but describes a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050 (ARB 2014b).

The ARB has no legislative mandate to set a target beyond the 2020 target from AB 32 or to adopt additional regulations to achieve a post-2020 target. The Update estimates that reductions averaging 5.2 percent per year would be required after 2020 to achieve the 2050 goal. With no estimate of future reduction commitments from the State, identifying a feasible strategy including plans and measures to be adopted by local jurisdictions is not currently possible.

Cap and Trade Program. The Cap and Trade Program is a key element of the Scoping Plan. It sets a statewide limit on sources responsible for 85 percent of California's greenhouse gas emissions, and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide covered entities the flexibility to seek out and implement the lowest cost options to reduce emissions. The program conducted its first auction in November 2012. Compliance obligations began for power plants and large industrial sources in January 2013. Other significant milestones include linkage to Quebec's cap and trade system in January 2014 and starting the compliance obligation for distributors of transportation fuels, natural gas, and other fuels in January 2015 (ARB 2015c).

SB 375–the Sustainable Communities and Climate Protection Act of 2008. Passing the Senate on August 30, 2008, Senate Bill (SB) 375 was signed into law on September 30, 2008 by Governor Schwarzenegger. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: it (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28 states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the greenhouse gas emission reduction targets.
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

AB 1493 Pavley Regulations and Fuel Efficiency Standards. California AB 1493, signed by Governor Davis on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. On January 21, 2009, the ARB requested that the EPA reconsider its previous waiver denial. On January 26, 2009, President Obama directed that the EPA assess whether the denial of the waiver was appropriate. On June 30, 2009, the EPA granted the waiver request. On September 8, 2009, the U.S. Chamber of Commerce and the National Automobile Dealers Association sued the EPA to challenge its granting of the waiver to California for its standards. California assisted the EPA in defending the waiver decision. The U.S. District Court for the District of Columbia denied the Chamber's petition on April 29, 2011. The EPA subsequently granted the requested waiver in 2009, which was upheld by the by the U.S. District Court for the District of Columbia in 2011.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in about a 22-percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30-percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation is intended to reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules are designed to clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles and hydrogen fuel cell cars. The regulations are further intended to ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

SB 1368–Emission Performance Standards. In 2006, the State Legislature adopted SB 1368, which was subsequently signed into law by the Governor Schwarzenegger. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5

years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law will effectively prevent California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation of 1,100 lbs CO_2 per megawatt-hour (MWh) of electricity from facilities owned by, or under long-term contract to, publicly owned utilities.

SB 1078–Renewable Electricity Standards. On September 12, 2002, Governor Gray Davis signed SB 1078 requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 107 changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Governor Schwarzenegger also directed the ARB (Executive Order S-21-09) to adopt a regulation by July 31, 2010, requiring the State's load serving entities to meet a 33 percent renewable energy target by 2020. The ARB Board approved the Renewable Electricity Standard on September 23, 2010 by Resolution 10-23.

SBX 7-7–The Water Conservation Act of 2009. The legislation directs urban retail water suppliers to set individual 2020 per capita water use targets and begin implementing conservation measures to achieve those goals. Meeting this statewide goal of 20 percent decrease in demand will result in a reduction of almost 2 million acre-feet in urban water use in 2020.

Executive Orders Related to GHG Emissions

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the State and guide the actions of state agencies.

Executive Order S-3-05. Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following reduction targets for GHG emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels.
- By 2020, reduce greenhouse gas emissions to 1990 levels.
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The State achieved the 2010 Executive Order S-3-05 target and is on track to achieve the 2020 target. The 2050 target currently has no legislative mandate or a Scoping Plan strategy to achieve the target. The 2014 First Update to the Scoping Plan lays a foundation for establishing a framework for achieving post-2020 targets, but has no mandate to implement a regulatory program as was authorized by AB 32 for the 2020 target.

Executive Order B-30-15. On April 29, 2015, Governor Brown issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's

executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The executive order sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050 and directs the ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of $MMTCO_2e$. The executive order also requires the State's climate adaptation plan to be updated every 3 years and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this executive order is not legally enforceable for local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate are in process in the State Legislature.

Executive Order S-01-07–Low Carbon Fuel Standard. Governor Schwarzenegger signed Executive Order S 01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the executive order established a Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

The Low Carbon Fuel Standard was challenged in the United States District Court in Fresno in 2011. The court's ruling issued on December 29, 2011 included a preliminary injunction against ARB's implementation of the rule. The Ninth Circuit Court of Appeals stayed the injunction on April 23, 2012 pending final ruling on appeal, allowing the ARB to continue to implement and enforce the regulation. The 9th Circuit's decision filed September 18, 2013, vacated the preliminary injunction. In essence, the court held that Low Carbon Fuel Standards adopted by ARB were not in conflict with federal law. On August 8, 2013, the Fifth District Court of Appeal (California) ruled ARB failed to comply with CEQA and the Administrative Procedure Act (APA) when adopting regulations for Low Carbon Fuel Standards. In a partially published opinion, the Court of Appeal reversed the trial court's judgment and directed issuance of a writ of mandate setting aside Resolution 09-31 and two executive orders of ARB approving LCFS regulations promulgated to reduce GHG emissions. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while ARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, ARB was required to bring a new LCFS regulation to the Board for consideration in February 2015. ARB held the first public hearing as required on February 19, 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The second public hearing for the new LCFS regulation was held on September 24 and 25, 2015, during which the LCFS Regulation was adopted. The Final

Rulemaking Package adopting the regulation was filed with the Office of Administrative Law (OAL) on October 2, 2015. The determination that took place on November 16, 2015 resulted in approval the Final Rulemaking Package. It was filed with the Secretary of State and has an effective date of January 1, 2016 (ARB 2015).

Executive Order S-13-08. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2009) was adopted, which is the ". . . first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

California Regulations and Building Codes

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

Title 20 Appliance Efficiency Regulations. California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. Twenty-three categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the State and those designed and sold exclusively for use in recreational vehicles or other mobile equipment (CEC 2012).

Title 24 Energy Efficiency Standards. California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The newest version of Title 24 was adopted by the California Energy Commission (CEC) on May 31, 2012. The standards became effective on July 1, 2014. The CEC is currently in the process of preparing the 2016 Building Energy Efficiency Standards that are scheduled to go into effect on January 1, 2017.

Title 24 California Green Building Standards Code (California Code of Regulations, Title 24 , Part 11: California Green Building Standards Code) or CALGreen is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect January 1, 2011 administered by the California Building Standards Commission. The code was updated on a regular basis with the 2013 California Green Building Code Standards that were effective January 1, 2014. It does not prevent a local jurisdiction from adopting a more stringent code as state law provides

methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they establish a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State building code provides the minimum standard that buildings must meet in order to be certified for occupancy. Enforcement is generally through the local building official.

The California Green Building Standards Code (California Code of Regulations Title 24, Part 11 code) requires:

- **Short-term bicycle parking**. If a commercial project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- **Long-term bicycle parking**. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space (5.106.4.1.2).
- **Designated parking**. Provide designated parking in commercial projects for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- **Recycling by occupants**. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling (5.410.1).
- **Construction waste**. A minimum 50-percent diversion of construction and demolition waste from landfills, increasing voluntarily to 65 and 80 percent for new homes and 80-percent for commercial projects. (5.408.1, A5.408.3.1 [nonresidential], A5.408.3.1 [residential]). All (100 percent) of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled (5.408.3).
- **Wastewater reduction**. Each building shall reduce the generation of wastewater by one of the following methods:
  - The installation of water-conserving fixtures or
  - Using nonpotable water systems (5.303.4).
- **Water use savings**. 20-percent mandatory reduction in indoor water use with voluntary goal standards for 30, 35 and 40-percent reductions (5.303.2, A5303.2.3 [nonresidential]).
- **Water meters**. Separate water meters for buildings in excess of 50,000 square feet or buildings projected to consume more than 1,000 gallons per day (5.303.1).
- **Irrigation efficiency**. Moisture-sensing irrigation systems for larger landscaped areas (5.304.3).
- **Materials pollution control**. Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring and particleboard (5.404).

- **Building commissioning**. Mandatory inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies (5.410.2).

Model Water Efficient Landscape Ordinance. The Model Water Efficient Landscape Ordinance (Ordinance) was required by AB 1881, the Water Conservation Act. The bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected upon compliance with the ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed DWR to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015 effective December 15, 2015. New development projects that include landscape areas of 500 square feet or more are subject to the Ordinance. The update requires:

- More efficient irrigation systems
- Incentives for graywater usage
- Improvements in on-site stormwater capture
- Limiting the portion of landscapes that can be planted with high water use plants
- Reporting requirements for local agencies.

ARB Refrigerant Management Program. The ARB adopted a regulation in 2009 to reduce refrigerant GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal. The regulation is set forth in sections 95380 to 95398 of Title 17, California Code of Regulations. The rules implementing the regulation establish a limit on statewide GHG emissions from stationary facilities with refrigeration systems with more than 50 pounds of a high GWP refrigerant. The refrigerant management program is designed to (1) reduce emissions of high-GWP GHG refrigerants from leaky stationary, non-residential refrigeration equipment; (2) reduce emissions from the installation and servicing of refrigeration and air-conditioning appliances using high-GWP refrigerants; and (3) verify GHG emission reductions.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)." Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA. The Natural

Resources Agency completed the approval process and the Amendments became effective on March 18, 2010 (2010 CEQA Amendments).

A new section, CEQA Guidelines Section 15064.4, was added to assist agencies in determining the significance of GHG emissions. The new section allows agencies the discretion to determine whether a quantitative or qualitative analysis is best for a particular project. However, little guidance is offered on the crucial next step in this assessment process—how to determine whether the project's estimated GHG emissions are significant or cumulatively considerable.

Also amended were CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts respectively. GHG mitigation measures are referenced in general terms, but no specific measures are championed. The revision to the cumulative impact discussion requirement (Section 15130) simply directs agencies to analyze GHG emissions in an EIR when a project's incremental contribution of emissions may be cumulatively considerable. It does not, however, answer the question of when emissions should be deemed cumulatively considerable, nor does it provide a specific threshold of significance.

Section 15183.5 permits programmatic GHG analysis and later project-specific tiering, as well as the preparation of Greenhouse Gas Reduction Plans. Compliance with such plans can support a determination that a project's cumulative effect is not cumulatively considerable, according to Section 15183.5(b).

In addition, the amendments revised Appendix F of the CEQA Guidelines, which focuses on Energy Conservation. The sample environmental checklist in Appendix G was amended to include GHG questions.

Regional

San Joaquin Valley Air Pollution Control District

On August 21, 2008, the SJVAPCD Governing Board approved a proposal called the Climate Change Action Plan (CCAP). The CCAP began with a public process bringing together stakeholders, land use agencies, environmental groups, and business groups to conduct public workshops to develop comprehensive policies for CEQA guidelines, a carbon exchange bank, and voluntary GHG emissions mitigation agreements for the Governing Board's consideration. The CCAP contains the following goals and actions:

- Develop GHG significance thresholds to address CEQA projects with GHG emission increases.
- Develop the San Joaquin Valley Carbon Exchange for banking and trading GHG reductions.
- Authorize use of the SJVAPCD's existing inventory reporting system to allow use for GHG reporting required by AB 32 regulations.
- Develop and administer GHG reduction agreements to mitigate proposed emission increases from new projects.

- Support climate protection measures that reduce greenhouse gas emissions as well as toxic and criteria pollutants. Oppose measures that result in a significant increase in toxic or criteria pollutant emissions in already impacted areas.

On December 17, 2009, the SJVAPCD Governing Board adopted "Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA," and the policy "District Policy—Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency." The SJVAPCD concluded that the existing science is inadequate to support quantification of the impacts that project-specific GHG emissions have on global climatic change. The SJVAPCD found the effects of project-specific emissions to be cumulative, and without mitigation, their incremental contribution to global climatic change could be considered cumulatively considerable. The SJVAPCD found that this cumulative impact is best addressed by requiring all projects to reduce their GHG emissions, whether through project design elements or mitigation.

The SJVAPCD's approach is intended to streamline the process of determining if project-specific GHG emissions would have a significant effect. Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources, and must have a certified final CEQA document.

For non-exempt projects, those projects for which there is no applicable approved plan or program, or those projects not complying with an approved plan or program, the lead agency must evaluate the project against performance-based standards and would require the adoption of design elements, known as a Best Performance Standard, to reduce GHG emissions. The Best Performance Standards (BPS) have not yet fully been established, though they must be designed to effect a 29-percent reduction when compared with the BAU projections identified in ARB's AB 32 Scoping Plan.

BAU represents the emissions that would occur in 2020 if the average baseline emissions during the 2002–2004 period were grown to 2020 levels, without control. These standards thus would carry with them pre-quantified emissions reductions, eliminating the need for project-specific quantification. Therefore, projects incorporating BPS would not require specific quantification of GHG emissions, and automatically would be determined to have a less than significant cumulative impact for GHG emissions.

For stationary source permitting projects, BPS means, "The most stringent of the identified alternatives for control of GHG emissions, including type of equipment, design of equipment and operational and maintenance practices, which are achieved-in-practice for the identified service, operation, or emissions unit class." The SJVAPCD has identified BPS for the following sources: boilers; dryers and dehydrators; oil and gas extraction, storage, transportation, and refining operations; cogeneration; gasoline dispensing facilities; volatile organic compound control technology; and steam generators.

For development projects, BPS means, "Any combination of identified GHG emission reduction measures, including project design elements and land use decisions that reduce project-specific GHG emission reductions by at least 29 percent compared with business as usual."

Projects not incorporating BPS would require quantification of GHG emissions and demonstration that BAU GHG emissions have been reduced or mitigated by 29 percent. As stated earlier, ARB's adjusted inventory reduced the amount required by the State to achieve 1990 emission levels from 29 percent to 21.7 percent to account for slower growth experienced since the 2008 recession. According to SJVAPCD guidance, quantification of GHG emissions would be required for all projects for which the lead agency has determined that an environmental impact report is required, regardless of whether the project incorporates BPS.

San Joaquin Valley Carbon Exchange

The SJVAPCD initiated work on the San Joaquin Valley Carbon Exchange in November 2008. The purpose of the carbon exchange is to quantify, verify, and track voluntary GHG emissions reductions generated within the San Joaquin Valley. However, the SJVAPCD has pursued an alternative strategy that incorporates the GHG emissions into its existing Rule 2301—Emission Reduction Credit Offset Banking that formerly only addressed criteria pollutants. The SJVAPCD is also participating with the California Air Pollution Control Officers Association (CAPCOA), of which it is a member, in the CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx). The GHG Rx is operated cooperatively by air districts that have elected to participate. Participating districts have signed a Memorandum of Understanding (MOU) with CAPCOA and agree to post only those credits that meet the Rx standards for quality. The objective is to provide a secure, low-cost, high -quality, greenhouse gas exchange for credits created in California. The GHG Rx is intended to help fulfill compliance obligations, or mitigation needs of local projects subject to environmental review, reducing the uncertainty of using credits generated in distant locations. The SJVAPCD currently has no credits posted to the GHG Rx (CAPCOA 2015).

Rule 2301

While the Climate Change Action Plan indicated that the GHG emission reduction program would be called the San Joaquin Valley Carbon Exchange, the District incorporated a method to register voluntary GHG emission reductions into its existing Rule 2301- Emission Reduction Credit Banking through amendments of the rule. Amendments to the rule were adopted on January 19, 2012. The purposes of the amendments to the rule include the following:

- Provide an administrative mechanism for sources to bank voluntary GHG emission reductions for later use.
- Provide an administrative mechanism for sources to transfer banked GHG emission reductions to others for any use.
- Define eligibility standards, quantitative procedures, and administrative practices to ensure that banked GHG emission reductions are real, permanent, quantifiable, surplus, and enforceable.

Local

City of Merced

General Plan

The Merced Vision 2030 General Plan was adopted by the Merced City Council in January of 2012 and establishes the following goals, objectives, and policies that are relevant to air quality and greenhouse gas emissions:

Urban Expansion Element

- **Policy UE-1.2:** Foster Compact and Efficient Development Patterns to Maintain a Compact Urban Form.

Transportation and Circulation Element

- **Policy T-1.6:** Minimize Adverse Impacts on the Environment from Existing and Proposed Road Systems.
- **Goal T-2.7:** Maintain a pedestrian-friendly environment.
- **Goal T-2.9:** Ensure that new development provides the facilities and programs that improve the effectiveness of Transportation Control Measures and Congestion Management Programs.

Open Space, Conservation, and Recreation Element

- **Policy OS-5.2:** Protect Soil Resources From the Erosive Forces of Wind and Water.
- **Implementing Action 5.2a:** Reduce soil erosion potential of new development.
- **Implementing Action 5.2b:** Encourage the planting of trees as windbreaks in agricultural areas of the community.
- **Implementing Action 5.2c:** Maintain adequate vegetation along the banks of urban streams and storm water drainage channels.

Sustainable Development Element

- **Goal Area SD-1:** Air Quality and Climate Change
- **Goal:** Clean Air with Minimal Toxic Substances and Odor
- **Goal:** Clean Air with Minimal Particulate Content
- **Goal:** Effective and Efficient Transportation Infrastructure
- **Goal:** Coordinated and Cooperative Inter-Governmental Air Quality Programs
- **Goal:** Reduction in the Generation of Greenhouse Gases (GHG) from New Development
- **Policy SD-1.1:** Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.
- **Policy SD-1.2:** Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.
- **Policy SD-1.3:** Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment.
- **Policy SD-1.4:** Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.
- **Policy SD-1.5:** Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.

- **Policy SD-1.6:** Reduce emissions of PM_{10} and other particulates with local control potential.
- **Policy SD-1.7:** Develop and implement a Climate Action Plan for the City.
- **Policy SD-1.8:** Implement Policies in Other General Plan Chapters to Address Air Quality and Greenhouse Gas Emissions Reduction Goals.
- **Policy SD-3.2:** Encourage the Use of Energy Conservation Features, Low-Emission Equipment, and Alternative Energy Sources for All New Residential and Commercial Development.

Climate Action Plan

The City of Merced's Climate Action Plan (CAP) was adopted by the Merced City Council in October of 2012 and highlights over 150 existing City policies and State regulations that, when adhered to, would result in a reduction of GHG emissions. A tool to implement the Climate Action Plan, called the Programmatic Climate Action Plan (PCAP), is being developed by the City.

Waste Diversion

The City of Merced Public Works Refuse Division is responsible for collection of all solid waste within City limits. Disposal rates for the City of Merced were not available; however, disposal rates for the Merced County region, including the city, were available. With the passage of SB 1016, the Per Capita Disposal Measurement System, only per capita disposal rates are measured. Targets are based on the per capita disposal rates. For 2009, 2010, and 2011 the target rate was 10.7 pounds per resident. The Merced County Solid Waste Regional Agency disposal rates were well below the target with 4.6 pounds per person per day in 2009, 4.4 pounds per person per day in 2010, and 4.4 pounds per day in 2011. Data for later years had not been finalized. The County has met the per capita target on a per-resident basis for each year of the last 3 reporting years with finalized data (CalRecycle 2015).

3.3.3 - Modeling Parameters and Assumptions

Model Selection and Guidance

Air pollutant emissions can be estimated by using emission factors and a level of activity. Emission factors are the emission rate of a pollutant given the activity over time; for example, grams of NO_x per horsepower hour. The ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model. An air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

The California Emissions Estimator Model (CalEEMod) version 2013.2.2 was developed by the SCAQMD in cooperation with other air districts throughout the State. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with construction and operation from a variety of land uses.

The modeling follows District guidance where applicable from its GAMAQI. The models used in this analysis are summarized as follows:

- Construction emissions: CalEEMod, version 2013.2.2
- Operational emissions: CalEEMod, version 2013.2.2

Air Pollutants and GHGs Assessed

Criteria Pollutants Assessed

The following air pollutants are assessed in this analysis:

- Reactive organic gases (ROG)
- Nitrogen oxides (NO_x)
- Carbon monoxide (CO)
- Sulfur oxides (SO_x)
- Particulate matter less than 10 microns in diameter (PM_{10})
- Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$)

Note that the project would emit ozone precursors ROG and NO_x. However, the project would not directly emit ozone, since it is formed in the atmosphere during the photochemical reaction of ozone precursors.

As noted previously, the project would emit ultrafine particles. However, there is currently no standard separate from the $PM_{2.5}$ standards for ultrafine particles and there is no accepted methodology to quantify or assess the significance of such particles.

GHGs Assessed

This analysis is restricted to GHGs identified by AB 32, which include carbon dioxide, methane, NO_x, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The project would generate a variety of GHGs, including several defined by AB 32 such as carbon dioxide, methane, and NO_x.

The project may emit GHGs that are not defined by AB 32. For example, the project may generate aerosols through emissions of DPM from the vehicles and trucks that would access the project site. Aerosols are short-lived particles, as they remain in the atmosphere for about one week. Black carbon is a component of aerosol. Studies have indicated that black carbon has a high global warming potential; however, the Intergovernmental Panel on Climate Change states that it has a low level of scientific certainty (Intergovernmental Panel on Climate Change 2007a).

Water vapor could be emitted from evaporated water used for landscaping, but this is not a significant impact because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks rather than emissions from project-related activities.

The project would emit nitrogen oxides and volatile organic compounds, which are ozone precursors. Ozone is a GHG; however, unlike the other GHGs, ozone in the troposphere is relatively short-lived and can be reduced in the troposphere on a daily basis. Stratospheric ozone can be reduced through reactions with other pollutants.

Certain GHGs defined by AB 32 would not be emitted by the project. Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the

project. Therefore, it is not anticipated that the project would emit perfluorocarbons or sulfur hexafluoride.

3.3.4 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated.

> Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.
>
> Would the project:
>
> a) Conflict with or obstruct implementation of the applicable air quality plan?
>
> b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
>
> c) 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 (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?
>
> d) Expose sensitive receptors to substantial pollutant concentrations?
>
> e) Create objectionable odors affecting a substantial number of people?

On February 16, 2010, the Office of Administrative Law filed the CEQA Guideline Amendments with the Secretary of State. The Amendments became effective on March 18, 2010. The CEQA Guidelines amendments included two new checklist questions pertaining to greenhouse gas emissions, listed below:

> Would the project:
>
> a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
>
> b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

This analysis will follow the guidance in the CEQA Guideline Amendments.

While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to CEQA Guidelines Section 15064(b), the SJVAPCD recommends that its quantitative and qualitative air pollution thresholds be used to determine the significance of project emissions. These thresholds are discussed under each impact section below.

3.3.5 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the proposed project and provides mitigation measures where appropriate.

Consistency with Air Quality Management Plan

Impact AIR-1:	**The project would not conflict with or obstruct implementation of the applicable air quality plan.**

Impact Analysis

The CEQA Guidelines indicate that a significant impact would occur if the proposed project would conflict with or obstruct implementation of the applicable air quality plan. The Guide for Assessing and Mitigating Air Quality Impacts does not provide specific guidance on analyzing conformity with the Air Quality Plan (AQP). Therefore, this document proposes the following criteria for determining project consistency with the current AQPs:

1. Will the project result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs? This measure is determined by comparison to the regional and localized thresholds identified by the District for Regional and Local Air Pollutants.
2. Will the project conform to the assumptions in the AQPs?
3. Will the project comply with applicable control measures in the AQPs?

The use of the criteria listed above is a standard approach for CEQA analysis of projects in the District's jurisdiction, as well as within other air districts, for the following reasons:

- Significant contribution to existing or new exceedances of the air quality standards would be inconsistent with the goal of attaining the air quality standards.
- Air Quality Plan (AQP) emissions inventories and attainment modeling are based on growth assumptions for the area within the air district's jurisdiction.
- AQPs rely on a set of air district-initiated control measures as well as implementation of federal and state measures to reduce emissions within their jurisdictions, with the goal of attaining the air quality standards.

AQPs are plans for reaching attainment of air quality standards. The assumptions, inputs, and control measures are analyzed to determine if the Air Basin can reach attainment for the ambient air quality standards. In order to show attainment of the standards, the District analyzes the growth projections in the valley, contributing factors in air pollutant emissions and formations, and existing and future emissions controls. The District then formulates a control strategy to reach attainment.

Contribution to Air Quality Violations

A measure of determining if the project is consistent with the air quality plans is if the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the air quality plans. Because of the region's nonattainment status for ozone, $PM_{2.5}$, and PM_{10}, if project-generated emissions of either of the ozone precursor pollutants (ROG and NO_x), PM_{10}, or $PM_{2.5}$ would exceed the District's significance thresholds, then the project would be considered to conflict with the attainment plans.

As discussed in Impact AIR-2 below, emissions of ROG, NO_x, PM_{10}, and $PM_{2.5}$ associated with the construction and operation of the project would not exceed the District's significance thresholds after incorporation of mitigation measures. As shown in Impact AIR-2 below, the project would not result in CO hotspots that would violate CO standards. Therefore, the project would not contribute to air quality violations.

Consistency with Assumptions in AQPs

The primary way of determining consistency with the AQP's assumptions is determining consistency with the applicable General Plan to ensure that the project's population density and land use are consistent with the growth assumptions used in the AQPs for the air basin.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and designates locations for land uses to regulate growth. The Merced County Association of Governments (MCAG) uses the growth projections and land use information in adopted general plans, among other sources, to estimate future average daily trips and then vehicle miles traveled (VMT), which are then provided to the District to estimate future emissions in the AQPs. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. AQPs detail the control measures and emission reductions required for reaching attainment of the air standards based on these growth and emission estimates.

The applicable General Plan for the project is the Merced Vision 2030 General Plan, which was adopted in 2012, prior to the District's adoption of the applicable AQPs. The General Plan is amended up to four times per year to allow changes to the planned land use and other plan elements as needed to accommodate development proposals that are not currently consistent with the General Plan. The changes in land use are then incorporated into the modeling assumptions of the regional transportation model on a periodic basis. Therefore, if the project's population growth and VMT are consistent with the General Plan, then the project is automatically consistent with the growth assumptions used in the applicable AQPs as described in Section 2.2.2.

Approximately 20 acres of the northern portion of the project site is currently designated "Medium to High Density Residential" in the General Plan and is zoned "R-3-2, Medium Density Residential" and the remaining 57.5 acres of the project site is designated "Regional Community Commercial" by the General Plan and is zoned "C-C, Central Commercial District." The proposed project will require a General Plan Amendment and a Zone Change that would reconfigure the boundary between the residential and commercial portions of the project site and would increase the amount of

commercial acreage by 12 acres (resulting in 67.5 acres total) and reduce the residential acreage by approximately 12 acres (resulting in 8 acres total). Although this would result in a reduction in the medium density residential designation acreage, the Master Plan concept includes a 178-unit high-density multi-family residential complex (21 units per acre) which results in a total number of units consistent with the anticipated unit count in the General Plan, which will comply with the City's goals for the regional housing allocation reflected in the City's Housing Element. Therefore, consistency would be determined based whether the AQPs contain an adequate emissions margin to accommodate the additional commercial growth resulting from the project.

The Conformity Analysis for the 2014 Regional Transportation Plan and for the 2015 Federal Transportation Improvement Program (MCAG, 2014) provides an assessment of the projected growth in emissions based on the latest planning assumptions compared with the emission budgets set in each AQP to reach attainment of air quality standards In each case, the projected emissions are well within the emission budgets for each modeled year. For example, the 2020 NO_x budget for the Ozone AQP is 9.9 tons per day while emissions based on the latest planning assumptions are projected to be 7.3 tons per day. This provides a margin of 2.6 tons per day that is available if growth exceeds forecasted amounts. The project's air quality analysis estimates NO_x emissions of 6.65 tons per year (0.02 ton per day) would be generated when the project becomes fully operational. Nearly 130 projects of this size that are not included in the latest planning assumptions could be accommodated in Merced County without exceeding the NO_x emission budget. For ROG, the 2020 ROG budget is 2.9 tons per day while emissions are projected to be 1.7 tons per day. The ROG emissions from the project are estimated at 9.99 tons per year (0.03 tons per day) when the project becomes fully operational. Nearly 40 projects of this size that are not included in the latest planning assumptions could be accommodated in Merced County without exceeding the ROG emission budget. All other nonattainment pollutant emission budgets for Merced County have similar or greater margins available for additional growth (MCAG, 2014). Therefore, the project would not obstruct the implementation of the applicable AQPs. Impacts would be less than significant impact.

Control Measures

The AQP contains a number of control measures, which are enforceable requirements through the adoption of rules and regulations. A detailed description of rules and regulations that apply to this project is provided in Section 2.2, Regulatory Setting. The project will comply with all of the District's applicable rules and regulations. Therefore, the project complies with this criterion and would not conflict with or obstruct implementation of the applicable air quality attainment plan.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measures AIR-2a through AIR-2e.

Level of Significance After Mitigation

Less than significant impact.

Potential for Air Quality Standard Violation

Impact AIR-2: **The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.**

Impact Analysis

Air pollutant emissions have regional effects and localized effects. This analysis assesses the regional effects of the project's criteria pollutant emissions in comparison to SJVAPCD thresholds of significance for short-term construction activities and long-term operation of the project. Localized emissions from project construction and operation are also assessed using concentration based thresholds compared with ambient air quality standards or significance thresholds.

The primary pollutants of concern during project construction and operation are ROG, NO_x, PM_{10}, and $PM_{2.5}$. The SJVAPCD current GAMAQI adopted in 2015 contains thresholds for ROG and NO_x; PM_{10}, and $PM_{2.5}$.

Ozone is a secondary pollutant that can be formed miles away from the source of emissions through reactions of ROG and NO_x emissions in the presence of sunlight. Therefore, ROG and NO_x are termed ozone precursors. The Basin often exceeds the state and national ozone standards. Therefore, if the project emits a substantial quantity of ozone precursors, the project may contribute to an exceedance of the ozone standard. The Basin also exceeds air quality standards for PM_{10}, and $PM_{2.5}$; therefore, substantial project emissions may contribute to an exceedance for these pollutants. The SJVAPCD annual emission significance thresholds used for the project define substantial contribution both operational and construction emissions are as follows:

- 10 tons per year ROG
- 10 tons per year NO_x
- 15 tons per year PM_{10}
- 15 tons per year $PM_{2.5}$
- 100 tons per year CO
- 27 tons per year SO_x

Construction Emissions

The construction-related air pollutant emissions associated with the construction of the project are shown in Table 3.3-6, segmented by each year construction is anticipated to occur. For assumptions in estimating the emissions, please refer to Appendix C. As shown in Table 3.3-6, the construction emissions would not exceed the District's thresholds of significance and are therefore, less than significant on a project level.

Table 3.3-6: Construction-Related Air Pollutant Emissions

Construction Year	Construction Phase	Emissions (tons per year)					
		ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2017	Phase 1	0.81	5.70	7.49	0.01	0.90	0.47
	Phase 4	0.53	4.13	4.05	0.01	0.54	0.35
	Total Year 2017	**1.34**	**9.83**	**11.54**	**0.02**	**1.44**	**0.83**

Table 3.3-6 (cont.): Construction-Related Air Pollutant Emissions

Construction Year	Construction Phase	Emissions (tons per year)					
		ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2018	Phase 1	0.71	4.63	7.18	0.01	0.68	0.33
	Phase 4	4.11	3.18	3.43	0.01	0.32	0.21
	Total Year 2018	**4.82**	**7.81**	**10.62**	**0.02**	**1.00**	**0.54**
2019	Phase 1	2.16	3.72	5.67	0.01	0.57	0.27
	Phase 4	0.19	<0.00	<0.00	<0.00	<0.00	<0.00
	Total Year 2019	**2.35**	**3.72**	**5.67**	**0.01**	**0.57**	**0.27**
2020	Phase 1	0.09	<0.00	<0.00	<0.00	<0.00	<0.00
	Phase 2	0.60	4.39	6.70	0.01	0.91	0.42
	Phase 5	0.31	1.65	1.67	<0.00	0.91	0.42
	Total Year 2020	**0.99**	**6.04**	**8.38**	**0.02**	**1.04**	**0.52**
2021	Phase 2	0.55	3.53	6.80	0.01	0.72	0.29
	Total Year 2021	**0.55**	**3.53**	**6.80**	**0.01**	**0.72**	**0.29**
2022	Phase 2	2.71	2.80	5.72	0.01	0.60	0.24
	Total Year 2022	**2.71**	**2.80**	**5.72**	**0.01**	**0.60**	**0.24**
2023	Phase 2	0.12	<0.00	<0.00	<0.00	<0.00	<0.00
	Phase 3	0.44	3.01	5.43	0.01	0.78	0.34
	Total Year 2023	**0.55**	**3.01**	**5.43**	**0.01**	**0.78**	**0.34**
2024	Phase 3	0.41	2.61	5.47	0.01	0.60	0.23
	Total Year 2024	**0.41**	**2.61**	**5.47**	**0.01**	**0.60**	**0.23**
2025	Phase 3	3.42	2.20	4.71	0.01	0.51	0.19
	Total Year 2025	**3.42**	**2.20**	**4.71**	**0.01**	**0.51**	**0.19**
2026	Phase 3	0.16	<0.00	<0.00	<0.00	<0.00	<0.00
	Total Year 2026	**0.16**	**<0.00**	**<0.00**	**<0.00**	**<0.00**	**<0.00**
Maximum Emissions		**4.82**	**9.83**	**11.54**	**0.02**	**1.44**	**0.83**
SJVAPCD Threshold		**10**	**10**	**100**	**27**	**15**	**15**
Significant?		No	No	No	No	No	No

Notes:
ISR reductions apply only to exhaust emissions
ROG=reactive organic gases NO_x=nitrogen oxides CO=carbon monoxide
SO_x=sulfur oxides PM_{10} and $PM_{2.5}$=particulate matter
Source of emissions: Appendix C CalEEMod Output.

Operational Emissions

Operational emissions occur over the lifetime of the project and are from three main sources: area sources, energy usage, and motor vehicles, or mobile sources. Emissions are shown with the incorporation of ISR compliance. The emissions shown are represented in CalEEMod as mitigated emissions, however, the reductions in emissions come through compliance with regulatory measures and locational features such as construction of pedestrian facilities and locating near other land use types. For assumptions in estimating the emissions, please refer to Section 4, Modeling Parameters and Assumptions. The operational emissions have been analyzed for years 2019, 2020, 2023, and 2026, which are the anticipated opening years for the five phases.

Year 2019 Operational Emissions

The year 2019 operational emissions, which consist of the operations of Phase 4 of the proposed project, are shown in Table 3.3-7. As shown in Table 3.3-7, the emissions are below the adopted and recommended SJVAPCD significance thresholds and, therefore, would result in a less than significant impact.

Table 3.3-7: Year 2019 Phase 4 Operational Air Pollutant Emissions

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources[1]	1.52	0.03	2.35	<0.00	0.18	0.18
Energy Usage[2]	0.01	0.10	0.04	<0.00	0.01	0.01
Mobile Sources[3]	0.64	0.91	7.39	0.02	1.25	0.34
Subtotal	*2.17*	*1.04*	*9.78*	*0.02*	*1.44*	*0.53*
Reductions from ISR compliance[4]	—	-0.34	—	—	-0.72	—
Total	**2.17**	**0.70**	**9.78**	**0.02**	**0.72**	**0.53**
Significance threshold	10	10	100	27	15	15
Exceed threshold–significant impact?	No	No	No	No	No	No

Notes:
ROG=reactive organic gases NO_x=nitrogen oxides PM_{10} and $PM_{2.5}$=particulate matter
[1] Area source emissions include emissions from consumer products, landscape, and painting.
[2] Energy usage consists of emissions from electricity and natural gas usage.
[3] Mobile sources consist of emissions from vehicles and road dust.
[4] ISR compliance assumes a 33 percent reduction of NO_x and 50 percent reduction of PM_{10} from all operation emissions in the operational year examined (2019).
Source: Appendix C.

Year 2020 Operational Emissions

The year 2020 operational emissions, which consist of the operations of Phases 1, 4, and 5 of the proposed project are shown in Table 3.3-8. As shown in Table 3.3-8, the emissions are below the adopted and recommended SJVAPCD significance thresholds and, therefore, would result in a less than significant impact.

Table 3.3-8: Year 2020 Phases 1, 4 and 5 Operational Air Pollutant Emissions

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources[1]	4.29	0.03	2.35	<0.00	0.18	0.18
Energy Usage[2]	0.04	0.37	0.27	<0.00	0.03	0.03
Mobile Sources[3]	4.00	4.79	40.19	0.09	6.82	1.86
Subtotal	*8.33*	*5.20*	*42.81*	*0.10*	*7.03*	*2.07*
Reductions from ISR compliance[4]	—	-1.72	—	—	-3.51	—
Total	**8.33**	**3.48**	**42.81**	**0.10**	**3.52**	**2.07**
Significance threshold	10	10	100	27	15	15
Exceed threshold–significant impact?	No	No	No	No	No	No

Notes:
ROG=reactive organic gases NO_x=nitrogen oxides PM_{10} and $PM_{2.5}$=particulate matter
[1] Area source emissions include emissions from consumer products, landscape, and painting.
[2] Energy usage consist of emissions from electricity and natural gas usage.
[3] Mobile sources consist of emissions from vehicles and road dust.
[4] ISR compliance assumes a 33 percent reduction of NO_x and 50 percent reduction of PM_{10} from all operation emissions in the operational year examined (2020).
Source: Appendix C.

Year 2023 Operational Emissions

The year 2023 operational emissions, which consist of the operations of Phases 1, 2, 4, and 5 of the proposed project are shown in Table 3.3-9.

Table 3.3-9: Year 2023 Phases 1, 2, 4 and 5 Operational Air Pollutant Emissions

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources[1]	7.37	0.03	2.34	<0.00	0.18	0.18
Energy Usage[2]	0.08	0.76	0.59	<0.00	0.06	0.06
Mobile Sources[3]	7.35	8.11	70.99	0.20	14.60	3.99
Subtotal	*14.80*	*8.89*	*73.93*	*0.21*	*14.83*	*4.22*
Reductions from ISR compliance[4]	—	-2.93	—	—	-7.41	—
Total	**14.80**	**5.96**	**73.93**	**0.21**	**7.42**	**4.22**
Significance threshold	10	10	100	27	15	15
Exceed threshold–significant impact?	Yes	No	No	No	No	No

Table 3.3-9 (cont.): Year 2023 Phases 1, 2, 4 and 5 Operational Air Pollutant Emissions

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$

Notes:
ROG=reactive organic gases NO_x=nitrogen oxides PM_{10} and $PM_{2.5}$=particulate matter
[1] Area source emissions include emissions from consumer products, landscape, and painting.
[2] Energy usage consists of emissions from electricity and natural gas usage.
[3] Mobile sources consist of emissions from vehicles and road dust.
[4] ISR compliance assumes a 33 percent reduction of NO_x and 50 percent reduction of PM_{10} from all operation emissions in the operational year examined (2023).
Source: Appendix C.

As shown in Table 3.3-9, the operational emissions from Phases 1, 2, 4, and 5 of the proposed project would emit ROG emissions above the adopted SJVAPCD significance threshold and, therefore, would result in a potentially significant impact.

Mitigation Measure AIR-2a, below, requires the preparation of a Transportation Demand Management (TDM) Program for each commercial building with 30,000 square feet or more of building space that will increase employee use of alternative transportation. Mitigation Measure AIR-2b requires the installation of a minimum of one electric vehicle charging station for each commercial building subject to the TDM Program. Mitigation Measure AIR-2c requires the applicant to incorporate into the project design all feasible measures detailed in Mitigation Measure 3.3-2 from the Merced Vision 2030 General Plan (provided in Appendix J). Mitigation Measure AIR-2d requires the project proponent to participate in the SJVAPCD's Indirect Source Review (ISR) program, which requires the project proponent to incorporate a combination of on-site measures and payment of fees to fund off-site measures to reduce NO_x by 33 percent and PM_{10} by 50 percent. Mitigation Measures AIR-2a, AIR-2b, AIR-2c, and AIR-2d will most likely provide greater reductions in ROG emissions than what is shown in Table 3.3-9; however, even though these Mitigation Measures will provide resources to promote alternative transportation and reductions in energy usage, they will require customers and employees to utilize these resources. Because of these variables, it is too speculative to quantify all of the emission reduction features provided in Mitigation Measures AIR-2a, AIR-2b, and AIR-2c.

As detailed above, design elements, mitigation measures, and compliance with District rules and regulations are not sufficient to reduce project-related impacts on air quality to a less than significant level. The SJVAPCD provides a mechanism whereby project proponents may enter into a Voluntary Emission Reduction Agreement (VERA) with the SJVAPCD to reduce the project-related impact on air quality to a less than significant level. A VERA is a mitigation measure by which the project proponent provides pound-for-pound mitigation of air emissions increases through a process that funds and implements emission reduction projects. Mitigation Measures AIR-2a through 2c help to reduce the impacts from vehicular emissions, however, they would not reduce ROG emissions to a less than significant level. Mitigation Measure AIR-2e requires the project proponent to enter into a VERA to reduce the operational emissions of ROG to a less than significant level. The

SJVAPCD's ozone attainment plan is NO_x limited, meaning the District has a focus on controlling emissions of NO_x versus ROG, therefore NO_x emission reductions may be substituted for ROG. The terms of the agreement would be negotiated as part of the VERA.

The year 2023 operational emissions from Phases 1, 2, 4, and 5 have been recalculated with implementation of Mitigation Measures AIR 2a through 2e and the results are shown in Table 3.3-10. As shown in Table 3.3-10, implementation of Mitigation Measures AIR-2a through AIR-2e would reduce year 2023 operational emissions from Phases 1, 2, 4, and 5 of the proposed project to less than significant levels.

Table 3.3-10: Mitigated Year 2023 Phases 1, 2, 4 and 5 Operational Air Pollutant Emissions

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources[1]	7.37	0.03	2.34	<0.00	0.18	0.18
Energy Usage[2]	0.08	0.76	0.59	<0.00	0.06	0.06
Mobile Sources[3]	7.10	7.30	64.55	0.17	12.82	3.50
Subtotal	14.56	8.08	67.49	0.18	13.05	3.74
Reductions from ISR compliance[4]	—	-2.66	—	—	-6.52	—
Reductions from VERA[5]	4.57	—	—	—	—	—
Total	**9.99**	**5.42**	**67.49**	**0.18**	**6.53**	**3.74**
Significance threshold	10	10	100	27	15	15
Exceed threshold–significant impact?	No	No	No	No	No	No

Notes:
ROG=reactive organic gases NO_x=nitrogen oxides PM_{10} and $PM_{2.5}$=particulate matter
[1] Area source emissions include emissions from consumer products, landscape, and painting.
[2] Energy usage consists of emissions from electricity and natural gas usage.
[3] Mobile sources consist of emissions from vehicles and road dust.
[4] ISR compliance assumes a 33 percent reduction of NO_x and 50 percent reduction of PM_{10} from all operation emissions in the operational year examined (2023).
[5] Mitigation Measure AIR 2d requires the applicant to commit to either project design features or a VERA that would reduce ROG emissions to less than 10 tons per year.
Source: Appendix C.

Year 2026 Operational Emissions

The year 2026 operational emissions, which consist of the operations of all Phases of the proposed project, are shown in Table 3.3-11.

Table 3.3-11: Year 2026 All Phases Operational Air Pollutant Emissions Prior to Mitigation

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources[1]	9.82	0.02	1.33	<0.00	0.01	0.01
Energy Usage[2]	0.11	0.95	0.76	0.01	0.07	0.07
Mobile Sources[3]	9.77	9.94	88.60	0.26	19.34	5.29
Subtotal	*19.70*	*10.90*	*90.68*	*0.27*	*19.43*	*5.37*
Reductions from ISR compliance[4]	—	-3.59	—	—	-9.71	—
Total	**19.70**	**7.31**	**90.68**	**0.27**	**9.72**	**5.37**
Significance threshold	10	10	100	27	15	15
Exceed threshold–significant impact?	Yes	No	No	No	No	No

Notes:
ROG=reactive organic gases NO_x=nitrogen oxides PM_{10} and $PM_{2.5}$=particulate matter
[1] Area source emissions include emissions from consumer products, landscape, and painting.
[2] Energy usage consists of emissions from electricity and natural gas usage.
[3] Mobile sources consist of emissions from vehicles and road dust.
[4] ISR compliance assumes a 33 percent reduction of NO_x and 50 percent reduction of PM_{10} from all operation emissions in the operational year examined (2026).
Source: Appendix C.

As shown in Table 3.3-11, the operational emissions from all Phases of the proposed project would emit ROG emissions above the adopted SJVAPCD significance threshold and, therefore, would result in a potentially significant impact.

As detailed above for the year 2023 analysis, design elements, mitigation measures, and compliance with District rules and regulations are not sufficient to reduce project-related impacts on air quality to a less than significant level. Mitigation Measures AIR-2a through AIR-2d help to reduce the impacts from vehicular emissions and on-site energy usage, however, they do not reduce ROG emissions to a less than significant level. Mitigation Measure AIR-2e requires the project proponent to enter into a VERA to reduce the operational emissions of ROG to a less than significant level. The SJVAPCD's ozone attainment plan is NO_x limited, meaning the District has a focus on controlling emissions of NO_x versus ROG, therefore NO_x emission reductions may be substituted for ROG. The terms of the agreement would be negotiated as part of the VERA.

The year 2026 operational emissions from all Phases of the proposed project have been recalculated with implementation of Mitigation Measures AIR 2a through 2e and the results are shown in Table 3.3-12. As shown in Table 3.3-12, implementation of Mitigation Measures AIR-2a through AIR-2e would reduce year 2026 operational emissions from all Phases of the proposed project to less than significant levels.

Table 3.3-12: Mitigated Year 2026 All Phases Operational Air Pollutant Emissions

Source	Emissions (tons per year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Sources[1]	9.82	0.02	1.33	<0.00	0.01	0.01
Energy Usage[2]	0.11	0.95	0.76	0.01	0.07	0.07
Mobile Sources[3]	9.57	9.28	83.24	0.24	17.75	4.85
Subtotal	*19.50*	*10.24*	*85.33*	*0.25*	*17.83*	*4.94*
Reductions from ISR compliance[4]	—	-3.59	—	—	-9.71	—
Reductions from VERA[5]	9.51	—	—	—	—	—
Total	**9.99**	**6.65**	**85.33**	**0.25**	**8.12**	**4.94**
Significance threshold	10	10	100	27	15	15
Exceed threshold–significant impact?	No	No	No	No	No	No

Notes:
ROG=reactive organic gases NO_x=nitrogen oxides PM_{10} and $PM_{2.5}$=particulate matter
[1] Area source emissions include emissions from consumer products, landscape, and painting.
[2] Energy usage consists of emissions from electricity and natural gas usage.
[3] Mobile sources consist of emissions from vehicles and road dust.
[4] ISR compliance assumes a 33 percent reduction of NO_x and 50 percent reduction of PM_{10} from the unmitigated operation emissions as detailed in Table 3.3-11.
[5] Mitigation Measure AIR 2a requires the applicant to commit to either project design features or a VERA that would reduce ROG emissions to less than 10 tons per year.
Source: Appendix C.

Localized Pollutant Analysis

The SJVAPCD's GAMAQI includes screening thresholds for identifying projects that need detailed analysis for localized impacts. Projects with on-site emission increases from construction activities or operational activities that exceed the 100 pounds per day screening level of any criteria pollutant after compliance with Rule 9510 and implementation of all enforceable mitigation measures would require preparation of an ambient air quality analysis. The criteria pollutants of concern for localized impact in the SJVAB are PM_{10}, $PM_{2.5}$, NO_2, and CO.

Construction-Related Localized Analysis

As shown in Table 3.3-13, an analysis of maximum daily emissions during construction and operation was conducted to determine if emissions would exceed 100 pounds per day for any pollutant of concern.

Table 3.3-13: Maximum Daily Unmitigated Construction Air Pollutant Emissions

Construction Sources	Maximum Daily On-site Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Year 2017 Phases 1 and 4	**105.57**	78.80	41.64	24.92
Year 2018 Phases 1 and 4	46.52	35.06	2.98	2.80
Year 2019 Phases 1 and 4	22.81	18.96	1.42	1.34
Year 2020 Phases 1, 2, and 5	58.48	48.54	26.84	15.63
Year 2021 Phase 2	17.34	16.54	0.95	0.90
Year 2022 Phase 2	15.54	16.33	0.81	0.76
Year 2023 Phases 2 and 3	36.24	36.00	19.53	11.28
Year 2024 Phase 3	13.38	16.13	0.61	0.57
Year 2025 Phase 3	12.41	16.05	0.53	0.49
Year 2026 Phase 3	1.15	1.81	0.05	0.05
Screening threshold	100	100	100	100
Exceed screening threshold?	Yes	No	No	No

Notes:
The highest emissions occur during the winter modeling run. CO operational emissions occur off-site and are addressed in the CO hot spot analysis.
NO_x=nitrogen oxides CO=carbon monoxide PM_{10} and $PM_{2.5}$=particulate matter
N/A=Not applicable
Source: Appendix C.

Table 3.3-13 shows the maximum daily emissions that would occur during the simultaneous construction of Phases 1 and 4 in 2017. As shown in Table 3.3-13, NO_x on-site emissions would exceed the daily screening threshold in year 2017. This would be considered a significant impact.

Mitigation Measure AIR-2f is provided, that would require either that at least half of the construction equipment utilized during site preparation and grading activities for Phases 1 and 4 to meet Tier 4 emissions standards, or the restriction of simultaneous site preparation and grading activities for Phases 1 and 4. The maximum daily NO_x emissions for Phases 1 and 4 with implementation of Mitigation Measure AIR-2f has been calculated through use of the CalEEMod, which found that the daily NO_x emissions would be reduced to a maximum of 52.66 pounds per day. Therefore, with implementation of Mitigation Measure AIR-2f, localized construction emissions would be reduced to less than significant levels.

Operations-Related Localized Analysis

The maximum daily operational emissions would occur at project buildout, which was assumed to occur in 2026. Operational emissions include emissions generated on-site by area sources such as natural gas combustion and landscape maintenance, and off-site by motor vehicles accessing the project. Since most motor vehicle emissions would occur distant from the site and would not

contribute to a violation of ambient air quality standards, the mobile source emissions were divided by 16, which represents the portion of vehicle emissions that would occur within a half mile of the project site. The results of the operational screening analysis are presented in Table 3.3-14. As shown in Table 3.3-14, the proposed project would not exceed the daily operational screening threshold. Impacts would be less than significant.

Table 3.3-14: Maximum Daily Operational Air Pollutant Emissions

Source	On-site Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Area Sources[1]	0.17	14.75	0.21	0.21
Energy Usage[2]	5.21	4.16	0.40	0.40
Mobile Sources[3]	13.56	76.13	8.12	2.38
Total	18.94	95.04	8.73	2.99
Screening threshold	100	100	100	100
Exceed screening threshold?	No	No	No	No

Notes:
[1] Area sources consist of emissions from consumer products, painting, and landscaping equipment.
[2] Energy usage consists of emissions from natural gas usage.
[3] Mobile sources based on 1/16 of the gross vehicular emissions and road dust, which represents the portion of the vehicle trips that occur within a half mile of the project site.
NO_x=nitrogen oxides CO=carbon monoxide PM_{10} and $PM_{2.5}$=particulate matter
N/A=Not applicable
Source: Appendix C.

Operation: Carbon Monoxide Hot Spot Analysis

Carbon monoxide (CO) "hot spot" thresholds ensure that emissions of CO associated with traffic impacts from a project in combination with CO emissions from existing and forecasted regional traffic do not exceed state or national ambient air quality standards for CO at any traffic intersection impacted by the project. CO emissions from motor vehicles have decreased greatly in the recent past. These improvements are due largely to the introduction of lower emitting motor vehicles and cleaning burning fuels. The last exceedance of either the state or national CO standard recorded at any of the Air Basin's monitoring stations was in 1991. At present, all areas within the Air Basin have attained the federal CO standard and are attainment or unclassified for the state CO standard.

The South Coast Air Quality Management District (SCAQMD) performed a detailed CO analysis in the Federal Attainment Plan for Carbon Monoxide for SCAQMD's 2003 Air Quality Management Plan (SCAQMD, 2003). The CO analysis analyzed the busiest intersections in Southern California, with intersections that have over 100,000 vehicles per day and operate at a level of service (LOS) of E or F, for both the morning and afternoon peak periods and the analysis did not find any intersections that would exceed the CO standards. Since the nearby intersections are much smaller with less traffic than what was analyzed by the SCAQMD, no local CO hot spots are anticipated to be created from

the proposed project and no CO hot spot modeling was performed. Impacts would be less than significant.

Hydrogen Sulfide

The project is not expected to generate hydrogen sulfide because the proposed land use does not typically generate it in any substantial quantity. Therefore, the project would not result in an exceedance of the California ambient air quality standard for hydrogen sulfide or cause any related health impact.

Lead

The project is not expected to generate lead because the proposed land use does not typically generate this pollutant in any substantial quantity. Lead is no longer an additive to gasoline. Therefore, the project would not result in an exceedance of the national or state ambient air quality standards for lead or cause any health impact.

Visibility-Reducing Particles

Visibility-reducing particles are suspended particulates that reduce visibility. During construction (grading), fugitive dust (PM_{10} and $PM_{2.5}$) is generated. The majority of this fugitive dust will remain localized and will be deposited near the project site. Fugitive dust during grading should not substantially impact local visibility. In addition, compliance with Regulation VIII will reduce fugitive dust impacts during grading. The main source of operational PM_{10} and $PM_{2.5}$ from the project is from road dust. This road dust would be localized and most of it would be deposited near the road and would not cause a substantial impact to visibility.

Vinyl Chloride

The vinyl chloride ambient air quality standard refers to the amount of vinyl chloride in the ambient air. The emissions of vinyl chloride are typically associated with the plants that make products containing polyvinyl chloride (PVC). The project will not generate vinyl chloride gas emissions. Therefore, the project would not result in an exceedance of the California ambient air quality standard for vinyl chloride and would not result in related health impacts.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-2a Prior to issuance of the certificate of occupancy for any proposed non-residential commercial use that consists of 30,000 square feet or more building space, the operator shall demonstrate to the satisfaction of the City of Merced that a Transportation Demand Management (TDM) Program will be implemented during operations. The TDM program shall have the following elements:

a) Secure bicycle parking for employees.
b) Employee lockers and breakroom.
c) Rideshare information bulletin board.
d) Incentives for employee rideshare, transit use, or bicycling/walking to work.

e) Include TDM program information in employee orientation documents and periodic company newsletters.

MM AIR-2b Prior to issuance of the certificate of occupancy of any proposed non-residential commercial use that consists of 20,000 square feet or more building space, the City of Merced shall verify that at least one electrical vehicle charging station is provided on the project site for each proposed commercial use that meet the above criteria in order to encourage the use of zero emission vehicles in accordance with California Green Building Code standards. Based on the proposed site plan, this would result in the installation of a minimum of nine (9) electrical vehicle charging stations on the project site.

MM AIR-2c Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that all feasible measures detailed in Mitigation Measure 3.3-2 from the Merced Vision 2030 General Plan (provided in Appendix J) have been incorporated into the project design.

MM AIR-2d Prior to city approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that an Indirect Source Review (ISR) application has been approved by SJVAPCD.

MM AIR-2e The project proponent shall submit evidence, verified by SJVAPCD, that demonstrates that the project's operational-related ROG emissions will be reduced to below SJVAPCD's numeric threshold of 10 tons per year, respectively. These reductions can be achieved by any combination of project design and/or via the project proponent entering into a development mitigation contract (e.g., Voluntary Emission Reduction Agreement, or VERA), with the SJVAPCD.

If a VERA is utilized, a copy of the executed agreement and implementing reports will be provided to the City to demonstrate compliance. Additionally, the project proponent shall supply updated documents if the requirements change as the VERA is reassessed by SJVAPCD at each phase of project development. This requirement will be enforced and verified by SJVAPCD. The current VERA payment fee for operational emissions is $94,000 per ton of NO_x (The SJVAPCD would likely substitute NO_x emissions for ROG emission reductions); payment fees vary by year (i.e., future year payment fees for NO_x could be more than the current price of $94,000) and are sensitive to the number of projects requiring emission reductions within the air basin. The VERA shall identify the amount of emissions to be reduced, in addition to the amount of funds to be paid to the SJVAPCD by the project proponent to implement emission reduction projects required for the project.

MM AIR-2f During the site preparation and grading of Phases 1 and 4, the project applicant shall require that either at least half of the construction equipment utilized during site

preparation and grading activities for Phases 1 and 4 meet Tier 4 emissions standards, or the project applicant shall restrict the simultaneous site preparation and grading activities for Phases 1 and 4.

Level of Significance After Mitigation

Less than significant impact.

Criteria Pollutants–Cumulative Considerable Net Increase

Impact AIR-3:	**The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).**

Impact Analysis

The cumulative air quality analysis prepared for the project follows guidance from Kern County and the SJVAPCD. In general, to result in a less than significant impact, the following must be true:

1. *Emissions analysis*: emissions of nonattainment pollutants must be below the SJVAPCD's project level significance thresholds. This is an approach recommended by the SJVAPCD in its 2015 GAMAQI.
2. *Summary of projections*: the project must be consistent with current air quality attainment plans including control measures and regulations. This is an approach consistent with Section 15130(b) of the CEQA guidelines.
3. *Cumulative health impacts*: the project must result in less than significant cumulative health effects from the nonattainment pollutants. This approach correlates the significance of the regional analysis with health effects, consistent with the court decision, *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1219-20.

Step 1: Emissions Analysis

If an area is in nonattainment for a criteria pollutant, then the background concentration of that pollutant has historically exceeded the ambient air quality standard. It follows that if a project exceeds the regional threshold for that nonattainment pollutant, then it would result in a cumulatively considerable net increase of that pollutant and result in a significant cumulative impact.

The Air Basin is in nonattainment for PM_{10}, $PM_{2.5}$, and ozone. Therefore, if the project exceeds the regional thresholds for PM_{10}, or $PM_{2.5}$, then it contributes to a cumulatively considerable impact for those pollutants. If the project exceeds the regional threshold for NO_x or ROG, then it follows that the project would contribute to a cumulatively considerable impact for ozone.

Regional emissions include those generated from all on-site and off-site activities. Regional significance thresholds have been established by the District because emissions from projects in the Air Basin can potentially contribute to the existing emission burden and possibly affect the attainment and maintenance of ambient air quality standards. Projects within the Air Basin region

with regional emissions in excess of any of the thresholds presented previously are considered to have a significant regional air quality impact.

The criteria pollutant emissions analysis assessed whether the project would exceed the District's thresholds of significance. As shown in Tables 3.3-6 to 3.3-14 criteria pollutant emissions would not exceed any threshold of significance during project construction or operation after the incorporation of mitigation measures. Therefore, the combination of unmitigated project emissions with the criteria pollutants from other sources within the Air Basin would not cumulatively contribute to a significant impact according to this criterion.

Step 2: Summary of Projections

Section 15130(b) of the CEQA Guidelines states:

> The following elements are necessary to an adequate discussion of significant cumulative impacts: 1) Either: (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or (B) A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts is based on a summary of projections analysis. The District attainment plans are based on a summary of projections that accounts for projected growth throughout the Air Basin and the controls needed to achieve ambient air quality standards. This analysis considers the current CEQA Guidelines, which includes the amendments approved by the Natural Resources Agency and effective on March 18, 2010. The Air Basin is in nonattainment or maintenance status for ozone and particulate matter (PM_{10} and $PM_{2.5}$), which means that concentrations of those pollutants currently exceed the ambient air quality standards for those pollutants or that the standards have recently been attained in the case of pollutants with maintenance status. When concentrations of ozone, PM_{10}, or $PM_{2.5}$ exceed the ambient air quality standard, then those sensitive to air pollution (such as children, the elderly, and the infirm) could experience health effects such as decrease of pulmonary function and localized lung edema in humans and animals, increased mortality risk, and risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans. See Section 3.3.1: Existing Air Quality Conditions for additional correlation of the health impacts with the existing pollutant concentrations experienced in the Merced area.

Under the amended CEQA Guidelines, cumulative impacts may be analyzed using other plans that evaluate relevant cumulative effects. The geographic scope for cumulative criteria pollution from air quality impacts is the Air Basin, because that is the area in which the air pollutants generated by the sources within the Air Basin circulate and are often trapped. The SJVAPCD is required to prepare and maintain air quality attainment plans and a State Implementation Plan to document the strategies and measures to be undertaken to reach attainment of ambient air quality standards. While the SJVAPCD does not have authority over land use decisions, it is recognized that changes in land use

and circulation planning would help the Air Basin achieve clean air mandates. The District evaluated emissions from land uses and transportation in the entire Air Basin when it developed its attainment plans. Emission inventories used to predict attainment of NAAQS must be based on the latest planning assumptions for mobile sources.

In accordance with CEQA Guidelines Section 15064, subdivision (h)(3), a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously approved plan or mitigation program.

The history and development of the SJVAPCD's current Ozone Attainment Plan is described in Section 3.3.2, Regulatory Framework. The 2007 8-Hour Ozone Plan contains measures to achieve reductions in emissions of ozone precursors and sets plans towards attainment of ambient ozone standards by 2023. The 2012 $PM_{2.5}$ Plan and the 2015 $PM_{2.5}$ Plan for the 1997 $PM_{2.5}$ Standard require fewer NO_x reductions to attain the $PM_{2.5}$ standard than the Ozone Plan, so the Ozone Plan is considered the applicable plan for reductions of the ozone precursors NO_x and ROG. The 2012 $PM_{2.5}$ Plan requires reductions in directly emitted $PM_{2.5}$ from combustion sources such as diesel engines and fireplaces and from fugitive dust to attain the ambient standard and is the applicable plan for $PM_{2.5}$ emissions. $PM_{2.5}$ is also formed in secondary reactions in the atmosphere involving NO_x and ammonia to form nitrate particles. Reductions in NO_x required for ozone attainment are also sufficient for $PM_{2.5}$ attainment. As discussed in Impact AIR-1, the project is consistent with all applicable control measures in the air quality attainment plans. The project would comply with any District rules and regulations that may pertain to implementation of the AQPs. Therefore, impacts would be less than significant with regard to compliance with applicable rules and regulations.

Cumulative Health Impacts from Criteria Pollutants

The Basin is in nonattainment for ozone, PM_{10}, and $PM_{2.5}$, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals (such as the elderly, children, and the sick). Therefore, when the concentration of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population would experience health effects that were described in Table 3.3-5. However, the health effects are a factor of a dose-response curve. Concentration of the pollutant in the air (dose), the length of time exposed, and the response of the individual are factors involved in the severity and nature of health impacts. Consequently, if a significant health impact results from project emissions, it does not mean that 100 percent of the population would experience health effects.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measures AIR-2a through AIR-2e.

Level of Significance After Mitigation

Less than significant impact.

Sensitive Receptors

Impact AIR-4: The project would not expose sensitive receptors to substantial pollutant concentrations.

Impact Analysis

Sensitive Receptors

Those individuals who are sensitive to air pollution include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. The District considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools.

Construction: ROG

During architectural coatings (painting), ROG is emitted. The amount emitted is dependent on the amount of ROG (or VOC) in the paint. ROG emissions are typically an indoor air quality health hazard concern and not an outdoor air quality health hazard concern. Therefore, exposure of ROG during architectural coatings is a less than significant health impact.

There are three types of asphalt that are typically used in paving: asphalt cements, cutback asphalts, and emulsified asphalts. However, District Rule 4641 prohibits the use of the following types of asphalt: rapid cure cutback asphalt; medium cure cutback asphalt; slow cure asphalt that contains more than one-half (0.5) percent of organic compounds that evaporate at 500 degrees Fahrenheit (°F) or lower; and emulsified asphalt containing organic compounds, in excess of 3 percent by volume, that evaporate at 500°F or lower. An exception to this is medium cure asphalt when the National Weather Service official forecast of the high temperature for the 24-hour period following application is below 50°F.

The acute (short-term) health effects from worker direct exposure to asphalt fumes include irritation of the eyes, nose, and throat. Other effects include respiratory tract symptoms and pulmonary function changes. The studies were based on occupational exposure of fumes. Residents are not in the immediate vicinity of the fumes; therefore, they would not be subjected to concentrations high enough to evoke a negative response. In addition, the restrictions that are placed on asphalt in the San Joaquin Valley reduce ROG emissions from asphalt and exposure. The impact to nearby sensitive receptors from ROG during construction is less than significant.

Operation: ROG

During operation, ROG would be emitted primarily from motor vehicles. Direct exposure to ROG from project motor vehicles would not result in health effects, because the ROG would be distributed across miles and miles of roadway and in the air. The concentrations would not be great enough to result in direct health effects.

Construction: NO_x, PM_{10}, $PM_{2.5}$

As discussed in Impact AIR-2, with implementation of Mitigation Measure AIR-2e localized concentrations of NO_x, PM_{10}, and $PM_{2.5}$ would not exceed the ambient air quality standards during construction of the proposed project. If the concentration of those pollutants is under the ambient

air quality standards, then no significant health effects would be observed. Therefore, the project would not expose sensitive receptors to substantial NO_x, PM_{10}, and $PM_{2.5}$ concentrations during construction.

Operation: PM_{10}, $PM_{2.5}$, CO, NO_2

As discussed in Impact AIR-2, localized concentrations of PM_{10}, $PM_{2.5}$, CO, and NO_2 would not exceed the ambient air quality standards. The ambient air quality standards were set to protect the health of sensitive individuals. If the concentration of those pollutants is under the ambient air quality standards, then no significant health effects would be observed. Therefore, the project would not expose sensitive receptors to substantial NO_x, PM_{10}, and $PM_{2.5}$ concentrations during operation.

Construction: Toxic Air Contaminants

Although construction of the project would involve the use of diesel-fueled vehicles, construction risks were not analyzed because of the short duration of the construction phase. While operational emissions are ongoing, the construction phase emissions are short-term. The California Office of Environmental Health Hazard Assessment (OEHHA) provides exposure variants for 9-, 30-, and 70-year exposures its Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2003). These exposures are chosen to coincide with the EPA's estimates of the average (9 years), high-end estimates (30 years) of residence time, and a typical lifetime (70 years). OEHHA states its support for the use of cancer potency factors for estimating cancer risk for these exposure durations. However, as the exposure duration decreases, the uncertainties introduced by applying cancer potency factors derived from very-long-term studies increases. Short-term high exposures are not necessarily equivalent to longer-term lower exposures even when the total dose is the same. OEHHA therefore does not support the use of current cancer potency factor to evaluate cancer risk for exposures of less than 9 years (refer to page 8-4 of OEHHA 2003).

Construction phase risks would be considered acute health risks as opposed to cancer risks, which are long-term. OEHHA has yet to define acute risk factors for diesel particulates that would allow the calculation of a hazards risk index; thus, evaluation of this impact would be speculative and no further discussion is necessary.

Operation: Toxic Air Contaminants

Any project with the potential to expose sensitive receptors or the public to substantial levels of TACs would have a potentially significant impact. A health risk is the probability that exposure to a given TAC under a given set of conditions will result in an adverse health effect. The health risk is affected by several factors, such as the amount, toxicity, and concentration of the contaminant; meteorological conditions; distance from the emission sources to people; the distance between emission sources; the age, health, and lifestyle of the people living or working at a location; and the length of exposure to the TAC. Operation of the proposed project would result in TAC emissions from diesel exhaust associated with diesel-powered delivery trucks and diesel-powered transportation units operating on the project site, gasoline vapors released from the proposed gasoline dispensing station, and possible charbroiler emissions from the 10 proposed restaurants.

According to Health Risk Assessments for Proposed Land Use Project (CAPCOA, 2009), diesel trucks have the potential to create significant cancer and non-cancer (acute and chronic) risks if a project is

located within 1,000 feet of an existing sensitive receptor (home or school) and generated more than 100 diesel trucks deliveries per day or more than 40 diesel trucks with operational diesel-powered transport refrigeration units. The nearest sensitive receptors to the project site consist of single-family homes located on the north side of the project site and north of Gerard Avenue and on the south side of the project site and south of Mission Avenue. Pioneer Elementary School located on the west side of the project site and west of Coffee Street. The portion of the project site that is within 1,000 feet of the nearby existing homes to the north would cover approximately the northern half of the North Parcel. The portion of the project site that is within 1,000 of the elementary school, would cover approximately half of the North Parcel, with the majority of this area consisting of the proposed multi-family residential uses. The portion of the project site that is within 1,000 feet of the nearby existing homes to the south would cover the majority of the South Parcel.

The anticipated bus and truck trips to the project site have been estimated in Appendix G, which found that the North Parcel would generate 48 bus, 80 medium truck, and 46 heavy truck daily trips or 24 bus, 40 medium truck and 23 heavy truck deliveries or round trips to the North Parcel. This results in a potential of 87 diesel-powered vehicle daily deliveries or round trips to the North Parcel, which is below CAPCOA's screening threshold of 100 delivery trucks per day. The South Parcel is anticipated to generate 58 medium truck and 20 heavy truck daily trips or 29 medium truck and 10 heavy truck deliveries to the South Parcel. This results in a potential of 39 diesel-powered daily truck deliveries to the South Parcel, which is below CAPCOA's screening threshold of 100 delivery trucks per day. Toxic air contaminant impacts from diesel vehicle emissions created from the proposed project would be less than significant.

The CAPCOA Guidelines also provide a screening distance of 300 feet for gasoline dispensing facilities. The proposed gas station would be located on the south parcel, approximately 1,300 feet from the existing homes located south of the project site, approximately 1,600 feet from Pioneer Elementary School and approximately 2,000 feet from the existing homes located north of the project site. Toxic air contaminant impacts from the proposed gas station would be less than significant.

The CAPCOA Guidelines do not provide a screening distance for TAC emissions from restaurant charbroilers. However the Health Risk Assessment for the Love's Travel Center Project in the City of Madera (Vista Environmental, 2015) provided a quantitative analysis of both gas station and charbroiler TAC emissions and the report found that the charbroilers produce TAC emissions at an approximately 10 percent higher rate than a gas station. Based on this ratio, it could be assumed that if a restaurant is located greater than 330 feet away from an existing sensitive receptor than the cancer and non-cancer (acute and chronic) health risks would be less than significant. The proposed project would consist of the development of 10 restaurants, with five restaurants located on the North Parcel and five restaurants located on the South Parcel. The proposed restaurants would be located as near as 1,100 feet from the existing homes to the north, 800 feet from the existing school to the west, and 800 feet from the existing homes to the south of the project site. All restaurants would be located outside of the 330 foot screening distance detailed above. Toxic air contaminant impacts from possible charbroilers at the proposed restaurants would be less than significant.

Cumulative TAC Analysis

A cumulative analysis of the project and all existing, and planned sources within the zone of influence of the project was conducted to determine if sensitive receptors impacted by the project would be subject to elevated cumulative risks defined as a combined cancer risk of 100 in a million at the maximally exposed sensitive receptor. The analysis also examined the impacts from existing, approved, and reasonably foreseeable TAC sources within 1 mile in accordance with SJVAPCD guidance.

ARB requires all facilities in California that emit TAC emissions to obtain a permit from ARB. ARB provides a Facility Search Engine at its website that can be used to identify facilities that emit TACs in different areas of the State. The project study area zip code of 95341 was analyzed in the Facility Search Engine and 15 facilities were identified that produce TAC emissions within the zip code. A detailed map search of each facility determined that none of the 15 facilities are located within one mile of the project site. Therefore, the cumulative health risk impacts would be less than significant.

Valley Fever

Valley fever, or coccidioidomycosis, is an infection caused by inhalation of the spores of the fungus, *Coccidioides immitis (C. immitis*). The spores live in soil and can live for an extended time in harsh environmental conditions. Activities or conditions that increase the amount of fugitive dust contribute to greater exposure, and they include dust storms, grading, and recreational off-road activities.

The San Joaquin Valley is considered an endemic area for Valley fever. By geographic region, hospitalizations for Valley fever in the San Joaquin Valley increased from 230 (6.9 per 100,000 population) in 2000 to 701 (17.7 per 100,000 population) in 2007. The Centers for Disease Control and Prevention indicates that 752 of the 8,657 persons (8.7 percent) hospitalized in California between 2000 and 2007 for Valley fever died (CDC 2009).

The distribution of *C. immitis* within endemic areas is not uniform and growth sites are commonly small (a few tens of meters) and widely scattered. Known sites appear to have some ecological factors in common suggesting that certain physical, chemical, and biological conditions are more favorable for *C. immitis* growth. Avoidance, when possible, of sites favorable for the occurrence of C. immitis is a prudent risk management strategy. Listed below are ecologic factors and sites favorable for the occurrence of *C. immitis*:

1) Rodent burrows (often a favorable site for C. immitis, perhaps because temperatures are more moderate and humidity higher than on the ground surface)
2) Old (prehistoric) Indian campsites near fire pits
3) Areas with sparse vegetation and alkaline soils
4) Areas with high salinity soils
5) Areas adjacent to arroyos (where residual moisture may be available)
6) Packrat middens

7) Upper 30 cm of the soil horizon, especially in virgin undisturbed soils
8) Sandy well aerated soil with relatively high water holding capacities

Sites within endemic areas less favorable for the occurrence of C. immitis include:

1) Cultivated fields
2) Heavily vegetated areas (e.g. grassy lawns)
3) Higher elevations (above 7,000 feet)
4) Areas where commercial fertilizers (e.g. ammonium sulfate) have been applied
5) Areas that are continually wet
6) Paved (asphalt or concrete) or oiled areas
7) Soils containing abundant microorganisms
8) Heavily urbanized areas where there is little undisturbed virgin soil (USGS 2000).

The project site is in an area with a long history of cultivation where fertilizers have been applied, and soil moisture has been maintained through irrigation. These factors would lead to a low probability of having *C. immitis* growth sites and exposure from disturbed soil.

Construction activities would generate fugitive dust that could contain *C. immitis* spores. The project will minimize the generation of fugitive dust during construction activities by complying with the District's Regulation VIII. Therefore, this regulation would reduce valley fever impacts to less than significant.

During operations, dust emissions are anticipated to be negligible, because most of the project area would be occupied by buildings, pavement, and landscaped areas. This condition would preclude the possibility of the project from generating fugitive dust that may contribute to Valley fever exposure. Impacts would be less than significant.

Indoor Air Pollution

Indoor air quality problems are caused primarily from indoor sources that release gases or particles into the air. Ventilation can decrease indoor pollutant levels by diluting the concentrations. The indoor air pollutants that may be associated with operation of the project include ROG from new carpets and fresh paints, mold spores, radon, cigarette smoke, and combustion sources. The air pollutants that are controlled by the construction of the project include ROG from carpets, paints, and radon. ROG from products and new paint are temporary impacts that can be reduced by proper ventilation after installation. The health impact from these sources is anticipated to be less than significant.

Radon is a naturally occurring colorless, odorless, and tasteless radioactive gas originating from the radioactive decay of uranium in rock, soil, and groundwater. Radon gets inside a building primarily from soil under homes. It is a known human lung carcinogen and is the largest source of radiation exposure to the public. Most radon is exhaled; however, the inhaled decay products can deposit into the lung where they irradiate sensitive airway cells, increasing the risk of lung cancer.

In general, the method and speed of radon's movement through soil is controlled by three conditions: the amount of water present in the pore space (the soil moisture content), the percentage of pore space in the soil (the porosity), and the permeability of the pore spaces that determines the soil's ability to transmit water and air. The distance that radon moves before most of it decays is less than 1 inch in water-saturated rocks or soils, but it can be more than 6 feet, and sometimes tens of feet, through dry rocks or soils. Even though the project area has no "real" source of uranium to produce radon gas, the permeability of the dry gravelly soils permits high indoor radon to occur.

Indoor radon tests were conducted by the California Department of Public Health (CDPH 2010). The project site is within Zip Code 95341, where no test has been performed, however adjacent Zip Code 95340 yielded nine of 35 samples or 25 percent that contained radon concentrations in excess of the EPA threshold of 4 picocuries per liter (pCi/l). Thus, based on these samples, the project area has a low potential for radon concentrations over 4.0 pCi/l. This potential impact is less than significant.

Naturally Occurring Asbestos

According to a map of areas where naturally occurring asbestos in California are likely to occur (U.S. Geological Survey 2011), there are no such areas in the project area. Therefore, development of the project is not anticipated to expose receptors to naturally occurring asbestos. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Objectionable Odors

Impact AIR-5:	**The projects would not create objectionable odors affecting a substantial number of people.**

Impact Analysis

Thresholds of Significance

Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration could also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas.

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. The Air District has determined the common land use types that are known to produce odors in the Air Basin. These types are shown in Table 3.3-15.

Table 3.3-15: Screening Levels for Potential Odor Sources

Odor Generator	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Compositing Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g., auto body shop)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile
Source: San Joaquin Valley Air Pollution Control District, 2002.	

According to the SJVAPCD's 2015 GAMAQI, analysis of potential odor impacts should be conducted for the following two situations:

- **Generators:** projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
- **Receivers:** residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

If the project were to result in sensitive receptors being located closer to an odor generator in the list in Table 3.3-15 than the recommended distances, a more detailed analysis including a review of District odor complaint records is recommended. The detailed analysis would involve contacting the District's Compliance Division for information regarding odor complaints. For a project locating near an existing source of odors, the project should be identified as having a significant odor impact if it is proposed for a site that is closer to an existing odor source than any location where there have been:

- More than one *confirmed* complaint per year averaged over a three-year period, or
- Three *unconfirmed* complaints per year averaged over a three-year period.

Project Analysis

Types of land uses that are typically identified as sources of objectionable odors include landfills, transfer stations, sewage treatment plants, wastewater pump stations, composting facilities, feed lots, coffee roasters, asphalt batch plants, and rendering plants. The project would not engage in any of these activities. In addition, a review of aerial maps of the project study determined that

none of the odor sources listed above in Table 3.3-15 are located within the screening distances to the proposed residential uses on the project site. Therefore, the proposed project would not be considered to have the potential to expose persons to substantial sources of objectionable odors.

During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the project's site boundaries. The potential for diesel odor impacts is therefore less than significant.

During project operations, the project could produce odors as a result of refuse storage and collection, and from cooking exhaust at restaurants. Refuse storage and collection areas would be constructed to accommodate solid waste generation by the proposed facilities, but all collection areas and containers will be enclosed to minimize generation of odors. Regardless, the scale and size of these activities would not meet any recognized standard as a source of substantial odors. Therefore, the odor impacts associated with refuse storage and collection as well as cooking exhaust would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Greenhouse Gas Inventory

Impact AIR-6:	**The project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment.**

Impact Analysis

The City of Merced adopted the Merced Climate Action Plan (City of Merced 2012), which was developed in order to implement the greenhouse gas emission reduction targets identified in AB 32. The Merced City Council approved a greenhouse gas reduction target of 1990 levels by 2020 be utilized in the Climate Action Plan. The Climate Action Plan utilized year 2008 as its baseline and determined that in 1990, the City's greenhouse gas emissions were 349,981 metric tons of CO_2 equivalent ($MTCO_2e$) per year and that by 2020 for the BAU forecast is 497,896 $MTCO_2e$ per year. Therefore, the Climate Action Plan was developed to cut 147,915 $MTCO_2e$ from BAU conditions by year 2020. This is equivalent to a 29.7 percent reduction over baseline year 2008 greenhouse gas emissions rates by the year 2020. In order to determine compliance with the Climate Action Plan, the proposed project's greenhouse gas emissions have been calculated for BAU (year 2008) and year 2020 with implementation of greenhouse gas emissions reduction project design features.

This analysis quantifies the emissions from project construction and operations. The assessment includes pollutants defined by AB 32: CO_2, CH_4, N_2O, and refrigerants used by the project. Other AB 32 pollutants such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are not used by the project and are not quantified in the analysis.

The analysis includes direct emissions from combustion sources such as natural gas consumption for space and water heating, and refrigerant leakage from refrigerators and freezers and air conditioning units. Indirect sources of emissions include motor vehicles attracted to the project site and electricity drawn from the power grid that is generated using fossil fuels elsewhere but used at the project site.

An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of the project. Upstream emission sources include but are not limited to emissions from the manufacture of cement, emissions from the manufacture of steel, and/or emissions from the transportation of building materials to the seller. The upstream emissions were not estimated because they are not within the control of the project and to do so would be speculative. Additionally, the California Air Pollution Control Officers Association White Paper on CEQA and Climate Change supports this conclusion by stating, "The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for . . . and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level" (CAPCOA 2008). Therefore, pursuant to CEQA Guidelines Sections 15144 and 15145, upstream/life cycle emissions are speculative and no further discussion is necessary.

Construction

The SJVAPCD does not recommend including construction related emissions in determining significance of GHG emissions. Additionally, emissions from construction would be temporary. However, other air districts such as the SCAQMD and the Sacramento Metropolitan Air Quality Management District recommend including construction emissions as a conservative approach. In order to account for the project's construction emissions, the emissions were amortized based on the average life of the development (commercial—30 years) and added to the operational emissions.

Construction emissions associated with the project were estimated using CalEEMod 2013.2.2 and the methodology detailed in Appendix G. A summary of construction emission for each year of construction activity is provided in Table 3.3-16.

Table 3.3-16: Construction Greenhouse Gas Emissions Summary

Construction Year and Phase(s)	Total $MTCO_2e$ per Year
2017—Phases 1 and 4	1,451.31
2018—Phases 1 and 4	1,433.16
2019—Phases 1 and 4	831.86
2020—Phases 1, 2 and 5	1,234.59
2021—Phase 2	1,063.04

Table 3.3-16 (cont.): Construction Greenhouse Gas Emissions Summary

Construction Year and Phase(s)	Total $MTCO_2e$ per Year
2022—Phase 2	923.24
2023—Phases 2 and 3	905.69
2024—Phase 3	964.61
2025—Phase 3	841.93
2026—Phase 3	0.34
Total	9,649.77
Amortized over 30 years	***321.66***

Notes:
Due to rounding, total $MTCO_2e$ may be marginally different from CalEEMod output.
$MTCO_2e$=metric tons of carbon dioxide equivalents
Source: CalEEMod output (Appendix G).

Operation

Operational or long-term emissions occur over the life of the project. Sources of emissions may include motor vehicles, energy usage, water usage, waste generation, refrigerants used in refrigerators, display cases and air conditioning systems, and area sources such as landscaping activities.

Business as Usual Operational Emissions

Operational GHG emissions associated with the project were estimated using CalEEMod 2013.2.2. The analysis uses emission factors for the year 2010, which is the closest year to 2008 in the CalEEMod and was chosen in order to be consistent with the business as usual (BAU) analysis in the Climate Action Plan. The analysis methodology utilized for the BAU analysis has been detailed in Appendix G.

2020 Operational Emissions

Operational emissions of the whole project for the year 2020 were modeled using CalEEMod 2013.2.2 to represent project emissions for the target year utilized in the Climate Action Plan. Since the proposed project would not be fully operational until 2026, the 2020 analysis provides a worst-case analysis as additional state-wide regulations would go into effect after 2020. The analysis methodology utilized for the year 2020 operational emissions analysis has been detailed in Appendix G.

For year 2020, CalEEMod emission factors incorporate compliance with some, but not all, applicable rules and regulations regarding energy efficiency and vehicle fuel efficiency, and other GHG reduction policies, as described in the CalEEMod User's Guide (SCAQMD 2013). Regulations applicable to project sources and the percent reduction anticipated from each source are shown in Table 3.3-17. The percentage reductions are only applied to the specific sources subject to the regulations. For example, the Pavley Low Emission Vehicle Standards apply only to light duty cars and trucks. A detailed description of the emission reductions from regulations is provided in Appendix G. In addition to the emission reductions from the regulations listed in Table 3.3-17, the year 2020 analysis also included the emissions reductions from Mitigation Measures AIR-2a and 2b

that require the implementation of a transportation demand management program and the installation of a minimum of nine electrical vehicle charging stations.

Table 3.3-17: Reductions from Greenhouse Gas Regulations

Regulation	Project Applicability	Reduction Source	Percent Reduction from BAU in 2020
Pavley Low Emission Vehicle Standards	Light duty cars and trucks accessing the site are subject to the regulation	CalEEMod defaults (Pavley I)I	25.1[1]
		Adjusted GHG emission factor (Pavley II/LEV III) in CalEEMod.	3%[2]
Low Carbon Fuel Standard (LCFS)	Vehicles accessing the site will use fuel subject to the LCFS	CalEEMod defaults	10%[1]
Title 24 Energy Efficiency Standards	Project buildings will be constructed to meet the latest version of Title 24 (currently 2013). Reduction applies only to energy consumption subject to the regulation.	CalEEMod defaults (2008) and CalEEMod mitigation component (2013)	25%
Green Building Code Standards	The project will include water conservation features required by the standard	CalEEMod mitigation component	20%[4]
Water Efficient Land Use Ordinance	The project landscaping will comply with the regulation	CalEEMod mitigation component	20%[5]
Renewable Portfolio Standard (RPS)	Electricity purchased for use at the project site is subject to the 33% RPS mandate	CalEEMod adjusted energy intensity factors from SCE	15.3%[6]
AB 341	Requires that a minimum of 75 percent of solid waste be diverted from landfills through recycling by 2020 and requires recycling bins at businesses	CalEEMod mitigation component (assumes 25 percent diversion for BAU condition)	50%

Notes:
Regulations are described in Section 2.3 Regulatory Environment. The source of the percentage reductions from each measure are from the following sources:
[1] Pavley 1 + Low Carbon Fuel Standard Postprocessor Version 1.0 User's Guide (ARB 2010c).
[2] ARB Staff Report for LEV III Amendments (ARB 2013)
[3] 2013 Title 24 Building Energy Efficiency Standards Adoption Hearing Presentation (CEC 2012)
[4] 2013 California Green Building Standards Code Section 5.303.2
[5] California Water Plan Update 2013 (CDWR 2013).
[6] SCE Emission Factor Local Government Operations Protocol (ARB 2010 and CPUC Large IOU RPS Procurement Data (CPUC 2011)

The results of the operations emission analysis are presented in Table 3.3-18. The table lists the emissions from the project BAU modeling scenario, the project with regulations in 2020 scenario, the percentage reduction from BAU for each source, and the overall project reduction from BAU.

Table 3.3-18: Project Operational Greenhouse Gases

Source	Emissions ($MTCO_2e$ per Year)		
	Business as Usual	2020 (with Regulations and Mitigation Measures AIR-2a and 2b)	Percent Reduction from BAU by Source
Area Sources	104.23	77.58	25.6
Energy Usage	4,588.81	3861.32	15.9
Mobile Sources	25,574.77	15856.96	38.0
Waste	996.19	498.10	50.0
Water	287.53	215.56	25.0
Amortized Construction Emissions	321.66	321.66	—
Total	*31,873.19*	*20,831.18*	—
		Total Reduction	**11,042**
		Percent Reduction	34.6%
		Significance Threshold	29.7%
		Are emissions significant?	No

Notes:
$MTCO_2e$=metric tons of carbon dioxide equivalents
Source of BAU emissions: CalEEMod output using 2010 emission factors to represent emissions in 2020 without regulations (Appendix G).
Source: CalEEMod output for the years 2010 and 2020 (Appendix G).

As shown in Table 3.3-18 , the project achieves a reduction of 34.6 percent from BAU in the year 2020 with regulations applied and implementation of Mitigation Measures AIR-2a and 2b. This is above the 29.7-percent reduction required by the City of Merced Climate Action Plan. Impacts would be less than significant with implementation of Mitigation Measures AIR-2a and 2b.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measures AIR-2a and AIR-2b.

Level of Significance After Mitigation

Less than significant impact.

Greenhouse Gas Reduction Plans

Impact AIR-7: **The project would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.**

Impact Analysis

The City of Merced adopted the Merced Climate Action Plan (City of Merced 2012), which was developed in order to implement the greenhouse gas emission reduction targets identified in AB 32. The Merced City Council approved a greenhouse gas reduction target of 1990 levels by 2020 be utilized in the Climate Action Plan. The Climate Action Plan provides specific strategies and actions for new developments, which are detailed below in Table 3.3-19. Table 3.3-19 also details the features incorporated into the project design in order to conform to the strategies.

Table 3.3-19: Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
Strategy EM: 1.5 Mobility Development Review Policies		
EM 1.5.1	Apply the following transit-related standards to new development projects	
	Continue to review land use decisions in the vicinity of the entire length of "M" Street to avoid creating or increasing conflicts with the intent of a major transitway (General Plan Policy T-2.1, Implementing Action 2.1.a).	Not applicable
	Promote land development patterns and site design criteria that support and enhance the use of public transit (General Plan Policy T-2.2, Implementing Action 2.2.a).	The proposed project would include the development of a transit stop that would enhance the use or public transit.
	Whenever feasible, avoid residential subdivision designs that require pedestrians to duplicate walking distance (double-back) to reach public transit routes (General Plan Policy T-2.2, Implementing Action 2.2.b).	The proposed project will be designed as a walkable community that will allow residents of the proposed residential units to walk to the proposed transit stop.
	Whenever feasible, avoid creating barriers that prevent convenient access to current or prospective public transit routes (General Plan Policy T-2.2, Implementing Action 2.2.c).	The proposed project will be designed as a walkable community that will minimize barriers between land uses.
	Include public transportation access in the review process for major public and private development projects, as well as all significant land use design proposals considered by the City (General Plan Policy T-2.3, Implementing Action 2.2.A).	The proposed project would include the development of a transit stop that would provide public access to public transit.
	Provide off-street passenger loading/unloading at major public transportation destinations (shopping centers, etc.) whenever possible (General Plan Policy T-2.3, Implementing Action 2.2.a).	The proposed project consists of a mixed-use commercial and residential development. All commercial uses would be accessed from on-site parking lots that will incorporate passenger loading areas.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	Continue to review land use decisions in the vicinity of "M" Street and Bellevue Road to avoid creating or increasing conflicts with the proposed future major commercial and office park sites at the major transfer point between designated transitway corridors (General Plan Policy T-2.1, Implementing Action 2.1.c).	Not applicable.
	Work cooperatively with Merced County and other interested agencies to review and evaluate development proposals in the vicinity of Bellevue Road that might conflict with the prospective Bellevue Transitway (General Plan Policy T-2.1, Implementing Action 2.1.f).	Not applicable.
EM 1.5.2	Apply the following bicycle-related standards to new development projects	
	Develop guidelines for public and private development relating to the design and location of bicycle parking facilities for both residential and non-residential uses and consider a bike parking ordinance (General Plan Policy T-2.5, Implementing Action 2.5.a).	Not applicable.
	Provide links between parks, schools, and open space areas via the bikeway system (General Plan Policy T-3.2, Implementing Action 3.2.c).	The on-site roadways of the commercial portion of the project site will be designed for the public to bike across (Mitigation Measure AIR-7a).
	Expand the existing bikeway system to all new growth areas as development occurs (General Plan Policy T-3.2, Implementing Action 3.2.c).	The proposed project will be required to complete construction of the adjacent roadways to city specifications that include installation of bike lanes.
	Make use of creekside areas, utility line easements, abandoned railroad rights-of-way, and canal easements for bikeway purposes (General Plan Policy T-3.2, Implementing Action 3.2.b).	Not applicable.
EM 1.5.3	Apply the following pedestrian-related standards to new development projects	
	Retain parkstrip and street tree planting requirements (General Plan Policy T-2.7, Implementing Action 2.7.a).	The proposed project will be designed to meet the City's parkstrip and tree planting requirements.
	Continue to require sidewalks and pedestrian ways for subdivisions and other development projects (General Plan Policy T-2.7, Implementing Action 2.7.e).	The proposed project will be designed with sidewalks consistent with City development standards.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	Continue to encourage safe and convenient pedestrian environments in the Downtown and other areas that attract a great deal of pedestrian traffic (General Plan Policy T-2.7, Implementing Action 2.7.f).	Although the proposed project is not located in downtown, the project consists of a mix of uses and aims to be designed to encourage a safe and convenient pedestrian environment (Mitigation Measure AIR-7b).
	Encourage the planting of shade trees and, as a minimum, plan for the prospective establishment of rest areas with seating facilities along major pedestrian ways (General Plan Policy T-2.7, Implementing Action 2.7.h).	The proposed project will promote the pedestrian ways constructed through the project site by providing amenities along the pedestrian ways.
	Continue to review and evaluate possible options for dealing with the issue of incomplete pedestrian access to development projects that will be major pedestrian destinations (General Plan Policy T-2.3, Implementing Action 2.2.a).	Not applicable.
	Continue to review land use and project proposals with the intent to avoid pedestrian barriers that prevent or create unnecessarily circuitous access to community and commercial areas (General Plan Policy T-2.8, Implementing Action 2.8.c).	Daffodil Avenue is the primary pedestrian access to the center from the north, but absent a protected multi-use crossing at this intersection with Gerard Avenue, pedestrians would take a circuitous route to gain access to the center (see Mitigation Measure AIR-7c).
EM 1.5.4	Consider amendments to City policies and ordinances where appropriate to implement the following actions of the Climate Action Plan:	
	Provision of amenities such as transit shelters, secure bicycle parking, and attractive pedestrian pathways.	The proposed project would include development of a transit station, bicycle parking, and pedestrian pathways
	Encourage all development projects proposed within 2,000 feet of an existing or planned light rail transit, commuter rail, express bus or transit corridor stop, to incorporate site design measures that improve accessibility to the transit system (General Plan Policy L-3.3 Implementing Action 3.3.d).	The proposed project would include development of a transit stop and would include site design measures such as pedestrian pathways to improve accessibility to the transit system.
EM 1.5.5	Ensure multiple points of access for all new development (General Plan Policy L-1.9, Implementing Action 1.9.a).	The proposed project would provide a multiple access points to the proposed project.
Strategy SC 2.5: Community Design Development Review Policies		
Compact Urban From/Infill Policies		
SC 2.5.1	Promote higher residential densities within the Merced urban area (General Plan Policy UE-1.2.—Implementing Action 1.2.d).	Not applicable.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
SC 2.5.2	Promote the Use of the Residential Planned Development Zoning Designation (General Plan Policy H-1.1.—Implementing Action 1.1.b).	The proposed project would include the development of up to 178 multi-family residential units that would be consistent with the Planned Development Zoning Designation.
SC 2.5.3	Encourage infill of vacant parcels (General Plan Policy L-3.2.—Implementing Action 3.2.a).	
	Encourage infill projects that are determined to be compatible with existing development.	Although the proposed project is not technically an infill project, it is adjacent to an existing school and housing and was designed to maximize compatibility with the nearby land uses.
	Encourage growth to occur in and around activity centers, transportation nodes, underutilized infrastructure systems, and redevelopment areas.	The proposed project is located on a major arterial near SR-99.
	Work with land owners to re-designate vacant lands suitable for higher densities or for transit/pedestrian-oriented developments during general plan updates and periodic reviews.	Not applicable.
SC 2.5.4	Encourage infill and redevelopment projects within the urban area that could enhance the effectiveness of the transit system (General Plan Policy L-3.2.—Implementing Action 3.2.b).	
	Encourage projects that increase pedestrian activity and mixed-uses.	The proposed project includes a mix of-uses and seeks to encourage increased pedestrian activity.
	Encourage commercial uses that are complementary to urban employment centers.	Not applicable.
	Strategically locate high-density development to provide good transit access.	The proposed project is located near a transportation node and would include development of a transit station.
SC 2.5.5	Plan areas for higher density development within 1/4 mile of locations identified as transit hubs and commercial centers (General Plan Policy L-3.1–Implementing Action 3.1.c).	The proposed project consists of a higher density development within0.25 mile of commercial and would include development of a transit stop.
Mixed Use Development Policies		
SC 2.5.6	Encourage residential and/or office above retail in the downtown area and in neighborhood commercial cores (General Plan Policy L-1.2–Implementing Action 1.2.b).	Not applicable.
SC 2.5.7	Encourage higher-density residential developments within walking distance (approx.	The proposed project would consist of higher-density residential development

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	¼ mile) of commercial centers (General Plan Policy L-1.2–Implementing Action 1.2.a).	within walking distance of a commercial center.
SC 2.5.8	Continue to allow second units in single-family areas (General Plan Policy L-1.2—Implementing Action 1.2.c).	Not applicable.
SC 2.5.9	Encourage duplexes on corner lots in low-density residential areas (General Plan Policy L-1.2–Implementing Action 1.2.d).	Not applicable.
SC 2.5.10	Consider density increases for existing residential sites where the necessary conditions exist for higher densities (General Plan Policy L-1.2–Implementing Action 1.2.e).	Not applicable.
SC 2.5.11	Provide a Range of Services Adjacent to And Within Industrial Areas to Reduce Auto Trips (General Plan Policy L-2.4).	Not applicable.
SC 2.5.12	Continue to allow services, such as restaurants and other retail commercial uses which mainly serve industrial employees, to locate in industrial zones as discretionary uses (General Plan Policy L-2.4–Implementing Action 2.4.b).	Not applicable.
SC 2.5.13	Locate and Design New Commercial Developments To Provide Good Access from Adjacent Neighborhoods and Reduce Congestion on Major Streets (General Plan Policy L-2.7).	
	Commercial centers shall be designed to provide direct vehicular and pedestrian access from surrounding neighborhoods. In no case shall trips which could be internal (from adjacent neighborhood to center) be forced onto an arterial (General Plan Policy L-2.7—Implementing Action 2.7.b).	The commercial portion of the proposed project will be designed to provide direct vehicular and pedestrian access to surrounding neighborhoods.
	Commercial developments shall be designed to encourage pedestrian, bicycle, and transit access (General Plan Policy L-2.7—Implementing Action 2.7.e).	Though sidewalks and bikeways are planned, continuous, convenient and safe pedestrian and bicycle improvements will be needed to encourage pedestrians and cyclists to use the commercial development (see Mitigation Measures AIR-7a and AIR-7b).
SC 2.5.14	Encourage a Mixture of Uses And Activities That Will Maintain the Vitality of the Downtown Area (General Plan Policy L-2.8—Implementing Action 2.7.e).	Not applicable.
SC 2.5.15	Encourage pedestrian or transit-friendly designs at suitable locations (General Plan Policy L-3.1—Implementing Action 3.1.a).	The proximity of the retail stores, grocery stores, and restaurants to nearby neighborhoods provides a land use pattern

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
		that encourages people to walk, bicycle, or use public transit.
SC 2.5.16	Encourage higher housing densities in areas served by the full range of urban services (General Plan Policy L-3.1—Implementing Action 3.1.d).	The proposed project would provide higher density housing adjacent to commercial uses and a school.
SC 2.5.17	Work closely with school districts to help them choose school site locations that allow students to safely walk or bicycle from their homes (General Plan Policy L-3.1—Implementing Action 3.1.f).	Not applicable.
SC 2.5.18	Consider air quality and mobility when reviewing any proposed change to the land use pattern of this community (General Plan Policy L-3.1—Implementing Action 3.1.h).	Not applicable.
SC 2.5.19	Encourage the Location of Multi-Family Developments on Sites With Good Access to Transportation, Shopping, Employment Centers, and Services (General Plan Policy L-1.7).	
	Designate areas adjoining arterial streets, major transportation routes and commercial areas for multi-family development (General Plan Policy L-1.7—Implementing Action 1.7.a).	The proposed project includes multi-family housing and is located near a major transportation route.
	Use the Urban Village Concept to promote higher density residential development adjacent to commercial services and transit (General Plan Policy L-1.7—Implementing Action 1.7.b).	Not applicable.
SC 2.5.20	Apply Transit-Ready Development or Urban Village Design Principles to New Development in the City's New Growth Areas (General Plan Policy UD-1.1).	The proposed project is located in the City's New Growth Area and includes transit-ready designs.
SC 2.5.21	Distribute and Design Urban Villages to Promote Convenient Vehicular, Pedestrian, and Transit Access (General Plan Policy UD-1.2).	Not applicable.
SC 2.5.22	Encourage development that is mixed use, infill, and higher density.	Not applicable.
SC 2.5.23	Encourage a "balanced" community, where residents do not have to travel long distances for service needs.	The proposed project encourages a balanced community with its design of a mixed-use commercial and residential development.
SC 2.5.24	Work to preserve and enhance existing neighborhoods and commercial districts which have transit and pedestrian-friendly designs and protect them from development that is	Not applicable.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	incompatible in design, scale, or use (General Plan Policy L-3.1—Implementing Action 3.1.b).	
SC 2.5.25	Encourage mixed-use developments that provide commercial services such as day care centers, restaurants, banks, and stores near employment centers (General Plan Policy L-3.1—Implementing Action 3.1.e).	Not applicable.
SC 2.5.26	Encourage Mixed Use Development (General Plan Policy H-1.1—Implementing Action 1.1.c).	Not applicable.
Growth Management Policies		
SC 2.5.27	The City should continue to require that all new urban development and annexations be contiguous to existing urban areas and have reasonable access to public services and facilities (General Plan Policy UE-1.3.—Implementing Action 1.3.a).	Not applicable.
SC 2.5.28	Consider expansion of the City's SUDP/SOI boundary for areas within the area of interest when certain conditions are met. (General Plan Policy UE-1.6)	Not applicable.
SC 2.5.29	The City shall encourage phasing of new development (General Plan Policy UE-1.3.—Implementing Action 1.3.c).	The proposed project would be constructed over five phases.
SC 2.5.30	Target the State Route 59 (South) Corridor as a priority annexation area (General Plan Policy UE-1.5–Implementing Action 1.5.f).	Not applicable.
SC 2.5.31	Continue to limit the expansion of City utilities to only those within an established urban expansion boundary (General Plan Policy UE-1.2.—Implementing Action 1.2.c).	Not applicable.
Community Appearance Policies		
SC 2.5.32	Encourage the Design and Construction of Aesthetic Streetscapes	
	Encourage the design of buildings that are in scale with adjacent development and harmonize with the character of the area or neighborhood (General Plan Policy UD-1.5, Implementing Action 1.5.b).	The proposed project is designed to match the scale of adjacent development by providing the multi-family development adjacent to the existing school and residential uses to the north of the project site.
	Discourage the visual monotony along major streets created by designs which use uninterrupted walls or fences with little or no	The proposed project will not construct any walls except where noise mitigation is required.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	landscaping (General Plan Policy UD-1.5, Implementing Action 1.5.c).	
	Encourage the development of methods to require acceptable levels of landscaping for new development and for effective maintenance in highly visible areas of the community (General Plan Policy UD-1.5, Implementing Action 1.5.d).	The landscaping for the proposed project will be designed to provide acceptable levels of landscaping.
	Landscape designs should incorporate water conservation and low maintenance features (General Plan Policy UD-1.5, Implementing Action 1.5.d).	The landscaping plan will be required to meet the State's Model Water Efficient Landscape Ordinance.
SC 2.5.33	Promote and Facilitate Core Commercial Design Principles in Village Commercial (General Plan Policy UD-1.3), by:	
	Each Village must have a mixed-use Core Commercial area containing ground floor retail and commercial space, including: Convenience Centers, Neighborhood Centers, and Community Centers (General Plan Policy UD-1.3, Implementing Action 1.3.a).	Not applicable.
	Core Commercial areas must be developed at sufficient intensity (typically a F.A.R. of at least 0.25) to create a focus of activity at the center of Villages (General Plan Policy UD-1.3, Implementing Action 1.3.a).	Not applicable.
	Office areas should be built at an intensity that concentrates activity near transit stops and Core Commercial areas (General Plan Policy UD-1.3, Implementing Action 1.3.a).	Not applicable.
SC 2.5.34	Design and Develop Public and Quasi-Public Buildings and Uses Utilizing Transit-Ready Development or Urban Village Principles (General Plan Policy UD-1.5), by:	
	Civic services should be placed in central locations in Villages (General Plan Policy UD-1.5, Implementing Action 1.5.a).	Not applicable.
	School sites should be selected by their respective districts in a way that provides opportunities to use pedestrian trails and bicycle routes to and from school and minimizes the need for students to cross arterial streets (General Plan Policy UD-1.5, Implementing Action 1.5.b).	Not applicable.
	Quasi-Public buildings such as religious buildings, fraternal halls, daycare facilities and private	Not applicable.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	schools are encouraged to be situated and designed to face neighborhood parks or village greens (General Plan Policy UD-1.5, Implementing Action 1.5.c).	
	Utility facilities such as wells, pump stations, and electrical substations should be located in sites poorly suited for other forms of development, such as small sites bounded by high voltage power lines and arterials (General Plan Policy UD-1.5, Implementing Action 1.5.d).	Not applicable.
	Public parks and plazas should be designed for both active and passive uses. They should reflect and reinforce the character of the surrounding area (General Plan Policy UD-1.5, Implementing Action 1.5.e).	Not applicable.
	Encourage subdivision designs that provide neighborhood parks in proximity to activity centers, such as schools, libraries, and community centers (General Plan Policy UD-1.5, Implementing Action 1.5.f).	Not applicable..
Measure WC 3.4: Water Conservation Development Review Process		
Water Conservation Policies		
WC 3.4.1	Within a year of adoption of the Climate Action Plan, the City shall consider amendments to City policies and ordinances where appropriate to implement the following actions of the Climate Action Plan:	
	Use of both potable and non-potable water to the maximum extent practicable; low flow appliances (i.e., toilets, dishwashers, shower heads, washing machines, etc.); automatic shut off valves for sinks in restrooms; drought resistant landscaping; “Save Water” signs near water faucets;	The proposed project will be required to meet the California Green Building Standards that mandate the use of low-flow appliances and automatic shut-off valves.
	Create water efficient landscapes;	The landscaping plan will be required to meet the State’s Model Water Efficient Landscape Ordinance.
	Use gray water. (Gray water is untreated household waste water from bathtubs, showers, bathroom wash facilities, and water from washing machines); and,	Not applicable.
	Provide education about water conservation and available programs and incentives	Not applicable.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
WC 3.4.2	Strengthen land use and development guidelines for new buildings and retrofits. The permitting process for developers and contractors can include clear parameters for integrating water conservation infrastructure and technologies, including low-flush toilets and low-flow showerheads	Not applicable.
WC 3.4.3	Implement the Water Efficient Landscape Ordinance as required by AB 1881.	The landscaping plan will be required to meet the State's Model Water Efficient Landscape Ordinance.
WC 3.4.4	Encourage the use of development techniques to direct rooftop runoff to pervious areas such as yards, garden beds, vegetated/soft bottom open channels, or on-site structural BMPs for capture, treatment, and reuse.	The proposed project will direct rooftop runoff to pervious areas, where possible.
WC 3.4.5	Require high-efficiency irrigation systems (low-flow drip, bubblers or low-flow sprinklers) in landscape plans. Ensure that the irrigation system is properly designed for the site.	The landscaping plan will be required to meet the State's Model Water Efficient Landscape Ordinance that requires the use of high-efficiency irrigation systems.
WC 3.4.6	Continue implementation of the Water Efficient Landscaping and Irrigation Ordinance and subsequent updates (General Plan Policy OS-5.1, Implementing Action 5.1.b).	The landscaping plan will be required to meet the State's Model Water Efficient Landscape Ordinance.
Water-Efficient Landscape Policies		
WC 3.4.7	Landscape Water Meter—Require customer installation of dedicated water meters for landscape irrigation on properties with more than 20,000 square feet of irrigated area.	The commercial portion of the proposed project is anticipated to be managed by a common maintenance agreement that would manage the water usage through use of dedicated water meters for project landscaping (see Mitigation Measure AIR-7d).
WC 3.4.8	Plant materials native to Merced, and encourage the use of drought-tolerant plant material.	The landscaping plan will be required to meet the State's Model Water Efficient Landscape Ordinance that requires the use of drought tolerant plants.
WC 3.4.9	Minimize turf areas and avoid narrow turf areas, such as in parking strips.	The Master Plan's landscaping standards prohibits the use of turf, except within the Central Green.
WC 3.4.10	Provide for installation and maintenance of additional landscaping which helps maintain and improve air quality, by continuing to increase the extent of landscaped areas in the City using street trees, parking lot shading, median islands, and landscape buffers (General Plan Policy SD-1.3–Implementing Action 1.3.f).	The landscape plan for the proposed project will include the planting of street and parking lot trees.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
Measure AR 4.4: Air Resources Development Review Policies		
AR 4.4.1	Accurately Determine and Fairly Mitigate the Local and Regional Air Quality Impacts of Projects Proposed in the City of Merced (General Plan Policy SD-1.1).	As detailed above in Impact AIR-2, the proposed project will be required to mitigate air emissions created by the proposed project.
AR 4.4.2	Include the evaluation of Greenhouse Gas Emissions and Climate Change in environmental review documents prepared by the City (General Plan Policy SD-1.1, Implementing Action 1.1.g).	As detailed above in AIR-6, the proposed project's greenhouse gas emissions have been quantified.
AR 4.4.3	Ensure that significant air quality impacts identified during CEQA review are consistently and fairly mitigated (General Plan Policy SD-1.1, Implementing Action 1.1.b).	As detailed above in Impact AIR-2, the proposed project will be required to mitigate air emissions created by the proposed project.
AR 4.4.4	Work with employers and developers to provide employees and residents with attractive, affordable transportation alternatives. Encourage new development to provide on-site facilities that encourage employees to use alternative transportation modes as air quality and transportation mitigation measures (General Plan Policy T-2.9, Implementing Action 2.9.b). Examples are listed below.	The proposed project would include bikeways, walkways, and development of a transit stop, all of which will promote the use of alternative transportation.
AR 4.4.5	On an ongoing basis, as information becomes available and regulations are adopted by the City and by state and regional agencies, the City shall partner with air pollution control agencies to advise project applicants of greenhouse gas and air pollutant emission significance thresholds, mitigation requirements, and control regulations promulgated by federal, state, regional, and local agencies.	Not applicable.
AR 4.4.6	On an ongoing basis, the City shall utilize its code enforcement police power to ensure ongoing compliance with requirements for air quality and sustainability measures incorporated into projects design, conditions of approval, and mitigation measures.	Not applicable.
AR 4.4.7	The City may utilize guidance from the Institute for Local Government, California Attorney General's Office, California Air Pollution Control Officers Association, and other sources of technical guidance in determining appropriate and feasible mitigation measures which may be	Not applicable.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	incorporated into land use plans, development projects and City operations to achieve GHG emission reductions.	
AR 4.4.8	As information becomes available and regulations and policies are adopted by the City and by state and regional agencies, the City shall provide residents and project applicants with a "toolkit" of understandable feasible measures that can be used to reduce greenhouse gases and criteria pollutants, including educational materials on energy-efficient and "climate-friendly" products.	Not applicable.
AR 4.4.9	On an ongoing basis, the City shall continue to evaluate its facility maintenance practices for opportunities to reduce GHGs, looking at facility cleaning and painting, parks maintenance, road maintenance, and utility system maintenance.	Not applicable.
AR 4.4.10	As additional technical information becomes available, the City shall consider strengthening its standards for purchasing low polluting and climate friendly goods and services, requiring that emission reductions be achieved by vendors and contractors through City contracts and/or giving preference to those who demonstrate implementation of GHG and criteria air pollution emission reductions in their facilities and operations.	Not applicable.
AR 4.4.11	State and federal legislation requires local government to include strategies to increase the efficiency of transportation infrastructure and to reduce vehicle trips in their transportation plans. Transportation control measures are most effective when infrastructure is in place that supports all transportation modes. This would include community-wide transportation improvements and on-site improvements at individual worksites and businesses. The City of Merced can support these strategies by encouraging developers to construct infrastructure that reduces congestion and/or trips. Examples alternative transportation site facilities:	
	Showers and lockers provided in office buildings	Not applicable.
	Safe and secure bicycle parking areas	Pursuant to Mitigation Measure AIR 2a, the proposed project will be required to provide secure bicycle parking areas.
	On-site employee cafeterias and eating areas	Not applicable.
	Convenient access to transit waiting areas from offices	The proposed project would include the development of a transit station.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
	The City may provide reduced parking requirements as an incentive for projects to incorporate measures proven to reduce employee commute trips or customer trips. Some methods developers/employers may use to encourage trip reduction and increased Average Vehicle Ridership include, rideshare matching, transit subsidies, vanpool subsidies, flexible work schedules, compressed work weeks, telecommuting, shuttle services, parking management, and guaranteed rides home.	Not applicable.
	Encouraging employers to provide preferential or subsidized parking for ride-sharing vehicles and low emission vehicles.	The commercial portion of the proposed project will be required to meet the CalGreen Building Standards that mandate installation of preferential parking for low emission vehicles.
	Providing land use patterns and site designs that increase commuter's ability to walk, bicycle, or use transit to get to work.	The proximity of the retail stores, grocery stores, and restaurants to nearby neighborhoods provides a land use pattern that encourages people to walk, bicycle or to use public transit.
Strategy WR 5.2: Waste Reduction Development Review Policies		
WR 5.2.1	The City shall continue to require provisions for recyclable material collection and storage areas to be incorporated into all residential development designs.	The residential portion of the proposed project will be required to provide recycling options to the proposed residents.
Strategy RE 6.2: Renewable Energy Development Review Policies		
RE 6.2.1	Require all new subdivisions to maximize, to the extent feasible, proper orientation of lots with regard to solar utilization (General Plan Policy SD-3.1, Implementing Action 3.1.b).	The majority of the project will be designed in the preferable north-south orientation for solar utilization.
RE 6.2.2	Encourage developers and builders to properly design all structures on each building lot in the City to take fullest advantage of solar use in heating and cooling (General Plan Policy SD-3.1, Implementing Action 3.1.c).	The majority of the project will be designed in the preferable north-south orientation for solar utilization.
RE 6.2.3	Encourage developers and builders to maximize "passive" solar design, such as large south-facing windows for winter heat gains and overhangs and shading for summer heat protection (General Plan Policy SD-3.1, Implementing Action 3.1.d).	The majority of the project will be designed in the preferable north-south orientation for solar utilization.

Table 3.3-19 (cont.): Reductions from Project Land Use and Transportation Measures

Climate Action Plan Strategy		Project Design Feature to conform to Strategy
Number	**Description**	
Strategy BE 7.6: Building Energy Conservation Development Review Policies		
BE 7.6.1	Encourage builders to develop "green" and/or LEED-Certified buildings (General Plan Policy SD-3.2, Implementing Action 3.2.d). Implement CALGreen.	The proposed project will meet the mandated CalGreen standards at the time building permits are obtained.
BE 7.6.2	Favor actual project improvements over payment of fees when complying with RULE 9410 of the San Joaquin Valley Air Pollution Control District.	Mitigation Measures AIR-2a through AIR-2d and AIR-7a through AIR-7d have been provided, which require the project proponent to institute project improvements to reduce emissions. However as detailed above in Impact AIR-2, it is not feasible to reduce the project's emissions to less than significant levels with only implementation of project improvements. Mitigation Measures AIR-2d and AIR-2e have been provided to ensure the adequate payment of fees to reduce project emissions to less than significant levels.
BE 7.6.3	Encourage new and renovated private and public buildings and site to contain "cool" pavements and roofs.	Pursuant to Title 24 Part 6 requirements, cool roofs will be required to be installed on all structures of the proposed project.
BE 7.6.4	Continue to require the planting of street trees along streets and inclusion of trees and landscaping for all development projects to help improve air-shed and minimize urban heat island effects.	The landscaping plan for the proposed project will include street and parking lot trees.
BE 7.6.5	Continue to require new development to plant street trees approximately 40 feet apart, at a maximum, along City streets (General Plan Policy OS-1.4, Implementing Action 1.4.b).	The landscaping plan for the proposed project will meet the City spacing requirements for street trees.
Source: City of Merced, 2012.		

As detailed above in Table 3.3-19, with implementation of Mitigation Measures AIR-7a through AIR-7d, the proposed project conforms to all applicable strategies for new developments that are detailed in the Climate Action Plan. Therefore, the proposed project is consistent with the City's Climate Action Plan. Impacts would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM AIR-7a Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that the on-site roadways of the commercial portion of the project site have been designed for the public to bike across.

MM AIR-7b Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that the project has been designed to encourage a safe and convenient pedestrian environment.

MM AIR-7c Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that a protected multi-use crossing will be installed at the intersection of Daffodil Drive and Gerard Avenue.

MM AIR-7d Prior to City approval of the final site plan for the project or issuance of the first grading permit for the project, whichever comes first, the project proponent shall provide the City of Merced with proof that dedicated water meters will be installed for landscape irrigation.

Level of Significance After Mitigation

Less than significant impact.

3.4 - Biological Resources

3.4.1 - Introduction

This section describes the existing biological setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on a site reconnaissance performed by FirstCarbon Solutions (FCS) Senior Supervising Ecologist Kristiaan Stuart on September 12, 2015.

3.4.2 - Environmental Setting

Mr. Stuart visited the property on September 12, 2015 between the hours of 1:30 p.m. and 4:00 p.m. to conduct a site review. Weather conditions during the site review were 91 degrees Fahrenheit, with 100 percent cloud/smoke cover, and wind speeds of 1 to 4 miles per hour.

Topography and Soils

The project site consists of a flat area within two parcels located south of East Gerard Avenue, east of Coffee Street, and north of Mission Avenue in the City of Merced, California. The maximum elevation (184 feet above mean sea level) is located in the northern section of the project site. Generally, the site is flat with very little elevation change. The United States Department of Agriculture's Natural Resources Conservation Service Soil Survey maps the project site as containing Landlow silty clay loam and Wyman clay loam. Landlow silty clay loam is a somewhat poorly drained silty clay loam soil found on basin floors. Its parent material is alluvium derived from mixed sources. Wyman clay loam is a well-drained clay loam soil found on terraces. Its parent material is alluvium derived from volcanic rock.

On-Site Habitat

The project site consists primarily of flat disturbed disked agriculture land. There is a large raised area of dirt and debris in the northern part of the site that is heavily occupied by California ground squirrel (*Otospermophilus beecheyi*). Along Coffee Street south of Campus Parkway, there is a potential drainage feature that may be jurisdictional. The parcel south of Campus Parkway consists of disturbed habitat containing weedy ruderal species, predominantly Russian thistle (*Salsola tragus*).

Vegetation

The majority of the northern section of the site consists of disturbed agriculture habitat. This is characterized by plowed or disked row crops and ruderal weedy species scattered throughout the habitat. Areas that were not recently disked, including an existing dirt road, show evidence of disturbance, including illegal dumping of trash and agricultural debris. The northern section consisted of primarily bare dirt during the time of the site review.

The southern section of the site, north of Campus Parkway, consists of disturbed land. This area is flat and shows evidence of grading and/or disking in the past, but it is currently characterized by a large dispersion of weedy species, with areas dominated by Russian thistle.

Wildlife

Plant communities provide food sources, along with foraging, nesting and denning sites, cover, and protection from adverse weather or predation. The following is a discussion of those wildlife species observed, expected, or not expected to occur on-site, with a focus on species identified as special-status or sensitive. The discussion is to be used as a general reference and is limited by the season, time of day, and weather condition in which the site review was conducted. Wildlife observations were based on calls, songs, scat, tracks, burrows, and actual sightings of animals.

Sensitive Biological Resources

Prior to the field survey, the CNDDB was reviewed for reported locations of listed and sensitive plant and wildlife species as well as sensitive natural plant communities, within a 9-quad area surrounding the Merced USGS 7.5-minute quadrangle. A search of published records of these species was conducted within this area using the CNDDB Rarefind5 online software (CDFW 2015). The CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS 2015) supplied information regarding the distribution and habitats of vascular plants in the project area. The literature review identified 25 special-status plant species, 29 special-status wildlife species, and two special-status habitats in the project area. Sensitive plant and wildlife species were evaluated for their potential to occur on the site based on habitat requirements, availability, and quality of suitable habitat, and known distributions.

Special-status Plant Species

The literature review and analysis found the project site is unlikely to support any special-status plant species. As a result, no focused surveys for special-status plants are deemed necessary.

Special-status Wildlife Species

The literature review and analysis found the project site was able to support three special-status wildlife species: burrowing owl, Swainson's hawk, and San Joaquin kit fox, discussed further below. The following species have not been evaluated through focused surveys to determine presence/ absence, but warrant discussion of the possible need for further surveys.

Burrowing Owl

Burrowing owl is designated a California species of special concern. Burrowing owl is found in shortgrass prairies, grasslands, lowland scrub, agricultural lands (particularly rangelands), prairies, coastal dunes, desert floors, and some artificial, open areas as a year-long resident. Burrowing owls may also use golf courses, cemeteries, road allowances within cities, airports, vacant lots in residential areas and university campuses, fairgrounds, abandoned buildings, and irrigation ditches. They require large open expanses of sparsely vegetated areas on gently rolling or level terrain with an abundance of active small mammal burrows. As a habitat feature necessary for site occupation, burrowing owls require the use of rodent or other burrows for roosting and nesting cover. They may also dig their own burrow in soft, friable soil and may also use pipes, culverts, and nest boxes where burrows are scarce. The mammal burrows are then modified and enlarged by the burrowing owl. One burrow is typically selected for use as the nest; however, satellite burrows are usually found within the immediate vicinity of the nest burrow and within the defended territory of the owl. A number of suitable burrows were noted throughout the site, particularly in the northern section.

Because of the overall presence of suitable habitat, including suitable burrows, the site has the potential to support burrowing owls. Section 3.4.6 of this report identifies project avoidance measures, including pre-construction burrowing owl surveys, to reduce the potential for any direct impacts to burrowing owls as a result of construction activities, including vegetation grubbing and grading.

Swainson's Hawk

Swainson's hawk is a listed state threatened species. Swainson's hawk breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. This species requires adjacent suitable foraging areas such as grasslands, alfalfa, or grain fields supporting rodent populations. The project site is a primarily flat, open disturbed agricultural field, with evidence of California ground squirrel populations present. A suitable hawk perch for foraging was observed in the northern section of the site, with whitewash present on and around it. The vicinity of the project contains numerous recorded occurrences of Swainson's hawk, as well as scattered trees, providing suitable habitat. Because of the overall presence of suitable habitat, including suitable foraging habitat and nesting habitat in the vicinity, the site has the potential to support Swainson's hawk. Section 3.4.6 of this report identifies avoidance measures, including pre-construction nesting raptor surveys, to reduce the potential for any direct impacts to Swainson's hawk as a result of construction activities, including vegetation grubbing and grading.

San Joaquin Kit Fox

San Joaquin kit fox is a federal endangered species. San Joaquin kit fox is found in arid climates such as desert scrub, chaparral, and grasslands. San Joaquin kit foxes construct dens for housing and shelter but may also enlarge and modify burrows constructed by other animals, or use man-made structures such as culverts, abandoned pipes, and banks. One San Joaquin kit fox may use several dens, particularly in summer months or to whelp or rear pups. The San Joaquin kit fox preys on a variety of rodents, hares, nesting birds, and insects, and also consumes some vegetation, particularly grasses. The site is a primarily flat, open disturbed agricultural field, with evidence of California ground squirrel populations present. Some burrows large enough to support San Joaquin kit fox were observed within the site, including a drainage pipe in the northern section of the site. Because of the overall presence of suitable habitat, including suitable foraging and den habitat in the vicinity, the site has the potential to support San Joaquin kit fox. Section 3.4.6 of this report identifies project avoidance measures, including focused surveys, to reduce the potential for any direct impacts to San Joaquin kit fox as a result of construction activities, including vegetation grubbing and grading.

3.4.3 - Regulatory Framework

This section provides an overview of the laws and regulations that influence biological resources. Many of these regulations will not apply to the project if sensitive biological resources are avoided.

As of January 1, 2013, the agency formerly known as the California Department of Fish and Game (CDFG) changed its name to the California Department of Fish and Wildlife (CDFW). Some

publications written prior to the change refer to the CDFG; therefore, this document refers to CDFG and the CDFW, as appropriate, referring to the same state agency.

Federal

Federal Endangered Species Act

The United States Fish and Wildlife Service (USFWS) has jurisdiction over species listed as threatened or endangered under the FESA. Section 9 of FESA protects listed species from "take," which is broadly defined as actions taken to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." FESA protects threatened and endangered plants and animals and their critical habitat. Candidate species are those proposed for listing; these species are usually treated by resource agencies as if they were actually listed during the environmental review process. Procedures for addressing impacts to federally listed species follow two principal pathways, both of which require consultation with the USFWS, which administers the FESA for all terrestrial species. The first pathway, Section 10(a) incidental take permit, applies to situations where a non-federal government entity must resolve potential adverse impacts to species protected under the FESA. The second pathway, Section 7 consultation, applies to projects directly undertaken by a federal agency or private projects requiring a federal permit or approval.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the U.S. and other nations devised to protect migratory birds, their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the California Fish and Game Code (FGC).

All raptors and their nests are protected from take or disturbance under the MBTA (16 United States Code [USC], Section 703, et seq.) and California statute (FGC Section 3503.5). The golden eagle (*Aquila chrysaetos*) and bald eagle (*Haliaeetus leucocephalus*) are also afforded additional protection under the Bald and Golden Eagle Protection Act, amended in 1973 (16 USC, Section 669, et seq.).

Bald and Golden Eagle Protection Act

With few exceptions, the Bald and Golden Eagle Protection Act 16 USC 668–668d) prohibits take of bald eagles and golden eagles. Unlike the MBTA, which defines "take" to mean only direct killing or taking of birds or their body parts, eggs, and nests, the Bald and Golden Eagle Protection Act defines take in a manner similar to FESA as including "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing," with "disturb" further defined (50 CFR 22.3) as ''to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.'' Therefore, the requirements for guarding against impacts to eagles generally are far more stringent than those required by the MBTA alone.

Executive Order 13112—Invasive Species

Executive Order (EO) 13112 directs all federal agencies to refrain from authorizing, funding, or carrying out actions or projects that may spread invasive species. The order further directs federal agencies to prevent the introduction of invasive species, control and monitor existing invasive species populations, restore native species to invaded ecosystems, research and develop prevention and control methods for invasive species, and promote public education on invasive species. As part of the proposed action, the USFWS and United States Army Corps of Engineers (USACE) would issue permits and therefore would be responsible for ensuring that the proposed action complies with EO 13112 and does not contribute to the spread of invasive species.

Clean Water Act Section 404

The USACE and the United States Environmental Protection Agency regulate the discharge of dredged or fill material into waters of the U.S., including wetlands, under Section 404 of the Clean Water Act (CWA). Waters of the U.S. include wetlands, lakes, and rivers, streams, and their tributaries. Wetlands that fall under the jurisdiction of the USACE (referred to as jurisdictional wetlands) are defined as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Areas not considered jurisdictional waters include, for example, non-tidal drainage and irrigation ditches excavated on dry land; artificially irrigated or created bodies such as small ponds, lakes or swimming pools; and water-filled depressions (33 CFR 328.3; 40 CFR 230.3).

Project proponents must obtain a permit from the USACE for all discharges of fill material into waters of the U.S., including jurisdictional wetlands, before proceeding with a proposed action. If wetlands are jurisdictional and could be filled as part of the project, the USACE may issue either an individual permit or a general permit. Individual permits are prepared on a project-specific basis for projects that are expected to have adverse effects on the aquatic environment. General permits are pre-authorized permits issued to cover similar activities that are expected to cause only minimal individual and cumulative adverse environmental effects.

A Section 404 permit may not be required if the project avoids the discharge of any fill material into waters of the U.S., including wetlands. If the project cannot be designed to avoid the discharge of fill or excavating in waters of the U.S., including wetlands, a Section 404 permit must be obtained.

Clean Water Act Section 401

The CWA requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards. The appropriate Regional Water Quality Control Board (RWQCB) regulates Section 401 requirements.

State

California Fish and Game Code

Under the CESA, the CDFW has the responsibility for maintaining a list of endangered and threatened species (FGC 2070). Sections 2050 through 2098 of the FGC outline the protection

provided to California's rare, endangered, and threatened species. Section 2080 of the FGC prohibits the taking of plants and animals listed under the CESA. Section 2081 established an incidental take permit program for state-listed species. CDFW maintains a list of "candidate species," which it formally notices as being under review for addition to the list of endangered or threatened species.

In addition, the Native Plant Protection Act of 1977 (FGC Section 1900, et seq.) prohibits the taking, possessing, or sale within the State of any plants with a state designation of rare, threatened, or endangered (as defined by CDFW). An exception to this prohibition in the Native Plant Protection Act allows landowners, under specified circumstances, to take listed plant species, provided that the owners first notify CDFW and give that state agency at least 10 days to come and retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed. (FGC Section 1913 exempts from "take" prohibition "the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way.") Project impacts to these species are not considered significant unless the species are known to have a high potential to occur within the area of disturbance associated with construction of the proposed project.

CDFW also maintains lists of "Species of Special Concern" that serve as species "watch lists." The CDFW has identified many Species of Special Concern. Species with this status have limited distribution or the extent of their habitats has been reduced substantially, such that their populations may be threatened. Thus, their populations are monitored, and they may receive special attention during environmental review. While they do not have statutory protection, they may be considered rare under CEQA and thereby warrant specific protection measures.

Sensitive species that would qualify for listing but are not currently listed are afforded protection under CEQA. CEQA Guidelines Section 15065 (Mandatory Findings of Significance) requires that a substantial reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines Section 15380 (Rare or Endangered Species) provides for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the CNPS's Lists 1A, 1B, and 2 would typically be considered under CEQA.

Sections 3500 to 5500 of the FGC outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. The CDFW cannot issue permits or licenses that authorize the take of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock.

Under Section 3503.5 of the FGC, it is unlawful to take, possess, or destroy any birds in the orders of *Falconiformes* or *Strigiformes* (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. To comply with the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project study area and determine whether the proposed project will have a potentially significant impact on such species. In addition, CDFW encourages informal consultation on any proposed project that may impact a candidate species.

Project-related impacts to species on the CESA endangered or threatened list would be considered significant. State-listed species are fully protected under the mandates of the CESA. "Take" of protected species incidental to otherwise lawful management activities may be authorized under FGC Section 206.591. Authorization from CDFW would be in the form of an Incidental Take Permit.

Section 1602 of the FGC requires any entity to notify CDFW before beginning any activity that "may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake" or "deposit debris, waste, or other materials that could pass into any river, stream, or lake." "River, stream, or lake" includes waters that are episodic and perennial; and ephemeral streams, desert washes, and watercourses with a subsurface flow. A Lake or Streambed Alteration Agreement will be required if CDFW determines that project activities may substantially adversely affect fish or wildlife resources through alterations to a covered body of water.

California Porter-Cologne Water Quality Control Act

The RWQCB has regulatory authority over wetlands and waterways under both the CWA and the State of California's Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Under the CWA, the RWQCB has regulatory authority over actions in waters of the U.S., through the issuance of water quality certifications under Section 401 of the CWA in conjunction with permits issued by the USACE under Section 404 of the CWA. When the RWQCB issues Section 401 certifications, it simultaneously issues general Waste Discharge Requirements for the project under the Porter-Cologne Water Quality Control Act. Activities in areas that are outside of the jurisdiction of the USACE (e.g., isolated wetlands, vernal pools, seasonal streams, intermittent streams, channels that lack a nexus to navigable waters, or stream banks above the ordinary high water mark) are regulated by the RWQCB under the authority of the Porter-Cologne Water Quality Control Act. Activities that lie outside of USACE jurisdiction may require the issuance of either individual or general waste discharge requirements.

Local

Merced General Plan

Policy OS-1.1

Identify and Preserve Wildlife Habitats Which Support Rare, Endangered, or Threatened Species.

The Merced SUDP/SOI is known to contain potential habitat for several sensitive wildlife species. Much of this potential habitat is located along riparian corridors of the community's creek system in vernal pools found in the northern part of the City's SUDP/SOI area, and on some agricultural lands throughout the planning area. As a matter of law, the City is required to review development proposals that threaten to impact known sensitive species. As a matter of policy, the City is committed to integrating potential wildlife habitat into the regional park and recreation system to enhance community awareness of the region's wildlife resources and to provide shelter for native plant and animal life of the area.

3.4.4 - Methodology

Literature Search

Special-status species are commonly characterized as species that are at potential risk or actual risk to their persistence in a given area or across their native habitat (locally, regionally, or nationally) and are identified by a state and/or federal resource agency as such. These agencies include governmental agencies such as the CDFW and the USFWS or private organizations such as the California Native Plant Society (CNPS). The degree to which a species is at risk of extinction is the limiting factor on a species status designation. Risk factors to a species' or population's persistence include habitat loss, increased mortality factors (take, electrocution, roadway hazards, etc.), invasive species, and environmental toxins.

In the context of environmental review, special-status species are defined by the following codes:

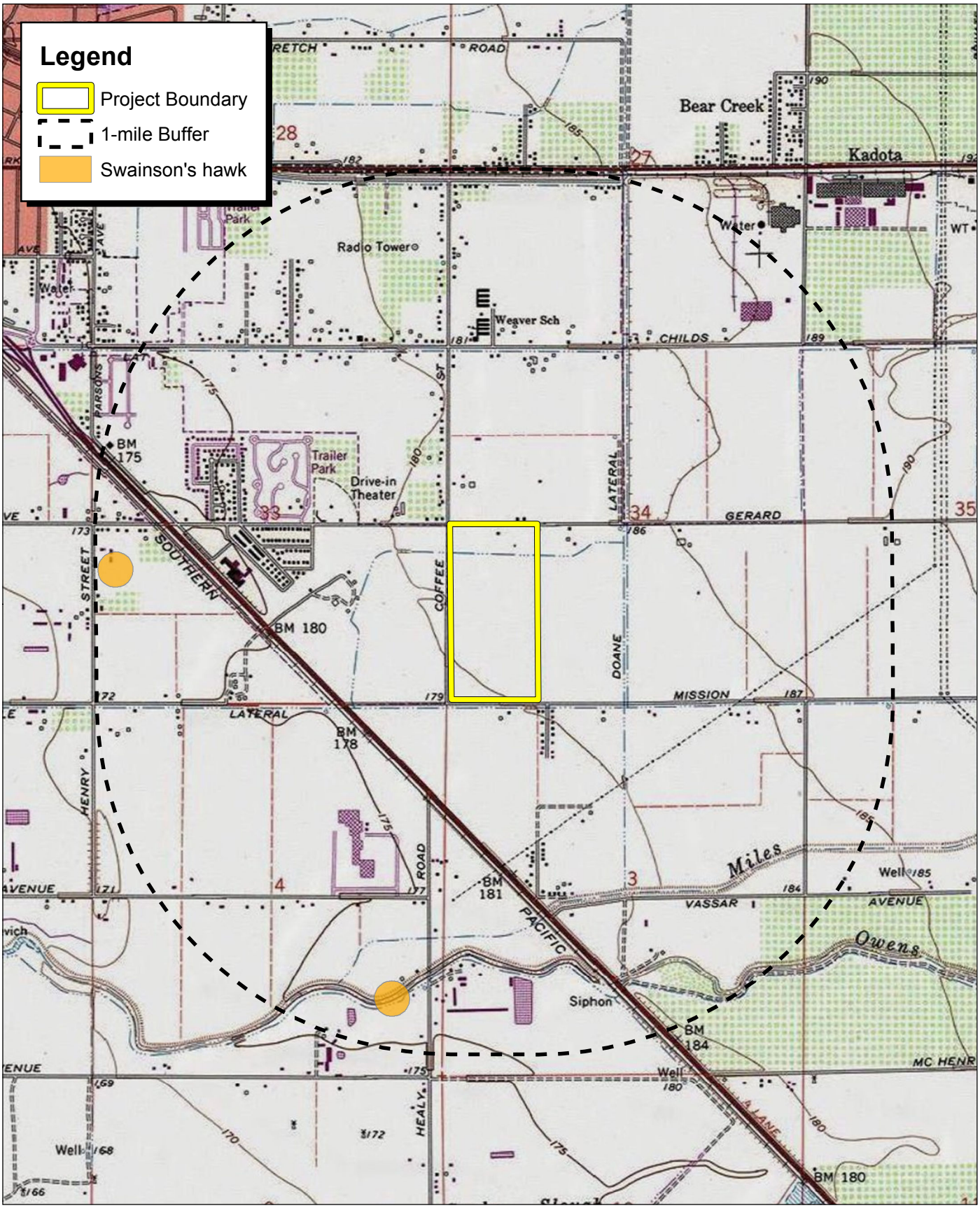
- Species that are listed, proposed, or candidates for listing under the Federal Endangered Species Act (FESA) (50 CFR 17.11—listed; 61 FR 7591)
- Species that are listed or proposed for listing under the California Endangered Species Act (CESA) (Fish and Game Code [FCG] 1992 Section 2050, et seq.; 14 California Code of Regulations [CCR] Section 670.1, et seq.)
- Species that are designated as Species of Special Concern by CDFW
- Species that are designated as Fully Protected by CDFW (FCG Section 3511, Section 4700, Section 5050, Section 5515)
- Species that meet the definition of rare or endangered under California Environmental Quality Act (CEQA) (14 CCR Section 15380)

Special-status species also includes:

- Species designated as sensitive by city, county, or other regional planning documents
- Species given a status of 1A, 1B, or 2 by CNPS

The designated sensitive species listed by CNPS have no direct legal protection, but require an analysis of the significance of potential impacts under CEQA guidelines.

Special-status plant and wildlife species were determined from a 9- quadrangle search (United States quadrangles) of the California Natural Diversity Database (CNDDB; CDFW 2015), CNPS electronic inventory (CNPS 2014), and the USFWS's Information, Planning, and Conservation System (USFWS 2011) list of special-status species that are known to occur in the vicinity of the project site. The results of the database searches are included in Appendix D. Each special-status species identified within the database search has been addressed individually in Table 3.4-1 and Table 3.4-2. The potential for each special-status species to occur within the project was evaluated based on known occurrences of each species within a 1-mile radius of the project site (Exhibit 3.4-1) utilizing the CDFW Biogeographic Information and Observation System online program (CDFW 2005), suitability of habitat within the project, and professional expertise.



Source: CNDDB, February, 2016

Exhibit 3.4-1
Special-status Species within
1-mile of Project Area

FirstCarbon® SOLUTIONS

2,000 1,000 0 2,000 Feet

THIS PAGE INTENTIONALLY LEFT BLANK

When the USFWS lists a species as threatened or endangered under FESA, areas of habitat considered essential to its conservation and survival may be designated as critical habitat. These areas may require special consideration and/or protection because of their ecological importance. Potential critical habitat designations within the general vicinity of the project site were checked using the USFWS Critical Habitat Portal (USFWS 2011).

3.4.5 - Field Survey

A pedestrian reconnaissance-level survey was conducted by FCS Senior Supervising Ecologist Kristiaan Stuart on September 12, 2015 to evaluate the project for biological resources, including on-site vegetation communities, potentially jurisdictional waters of the U.S., and to assess the potential for occurrence of special-status plant and wildlife species within the project. Vegetation communities and other biological resources were noted on an aerial photograph of the project. All species observed within and adjacent to the project were noted in a field notebook. Special attention was directed to portions of the project that may contain native vegetation, suitable habitat for sensitive plant and wildlife species, and potential waters and wetlands subject to regulatory agency jurisdiction. The undeveloped land surrounding the project was surveyed in order to confirm adjacent vegetation community/land cover types, and account for any potential indirect impacts associated with the project. The undeveloped land in the vicinity of the project was assessed on a local and regional level for its potential to function as a wildlife corridor or linkage for wildlife movement.

Table 3.4-1 lists special-status plant species identified by the CNDDB as occurring (either currently or historically) on or within 10 miles of the project; it also contains habitat descriptions and a rationale for the species' potential to occur within the project site or immediate vicinity.

Table 3.4-2 lists special-status wildlife species identified by the CNDDB as occurring (either currently of historically) on or within 10 miles of the project; it also contains habitat descriptions and a rationale for the species' potential to occur within the project site or immediate vicinity.

Table 3.4-1: Special-status Plant Species

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Agrostis hendersonii Henderson's bent grass	—	—	3.2	Monocot annual grass found in valley and foothill grassland, vernal pools. Little information exists; moist places in grassland or vernal pool habitat. Bloom period: April–June 70–305 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Atriplex cordulata var. *cordulata* heartscale	—	—	1B.2	Dicot annual herb found in chenopod scrub, valley and foothill grassland, meadows. Alkaline flats and scalds in the Central Valley, sandy soils. Bloom period: April–October 0–560 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Atriplex minuscula lesser saltscale	—	—	1B.1	Dicot annual herb found in chenopod scrub, playas, valley and foothill grassland. In alkali sink and grassland in sandy, alkaline soils. Bloom period: May–October 20–100m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Atriplex persistens vernal pool smallscale	—	—	1B.2	Dicot annual herb found in alkaline vernal pools. Bloom period: June–October 10–115m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Atriplex subtilis subtle orache	—	—	1B.2	Dicot annual herb found in valley and foothill grassland with alkaline soils. Bloom period: June–August 40–100m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-1 (cont.): Special-status Plant Species

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
California macrophylla round-leaved filaree	—	—	1B.2	Dicot annual herb found in cismontane woodland, valley and foothill grassland with clay soils. Bloom period: March–May 15–1,200m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Castilleja campestris var. *succulenta* succulent owl's-clover	FT	SE	1B.2	Dicot annual herb found in vernal pools. Prefers moist places, often in acidic soils. Bloom period: March–May 50–750m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Delphinium recurvatum recurved larkspur	—	—	1B.2	Dicot perennial herb found in Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. Bloom period: March–June 3–685m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Downingia pusilla dwarf downingia	—	—	2B.2	Dicot annual herb found in valley and foothill grassland (mesic sites) and vernal pools. Prefers vernal lake and pool margins with a variety of associates in several vernal pools. Bloom period: March–May 1–445m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Eryngium spinosepalum spiny-sepaled button-celery	—	—	1B.2	Dicot annual herb found in vernal pools, valley and foothill grassland. Some sites on clay soil of granitic origin; vernal pools within grassland. Bloom period: April–May 80–255m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-1 (cont.): Special-status Plant Species

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Gratiola heterosepala Boggs Lake hedge-hyssop	—	SE	1B.2	Dicot annual herb found in marshes and swamps (freshwater), vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins. Bloom period: April–August 10–2,375 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Lagophylla dichotoma forked hare-leaf	—	—	1B.1	Dicot annual herb found in cismontane woodland, valley and foothill grassland. Sometimes found in clay soils. Bloom period: April–June 45–335m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Navarretia nigelliformis ssp. *radians* shining navarretia	—	—	1B.2	Dicot annual herb found in cismontane woodland, valley and foothill grassland, vernal pools. Apparently in grassland, and not necessarily in vernal pools. Bloom period: April–July 60–855 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Neostapfia colusana Colusa grass	FT	SE	1B.1	Monocot annual grass found in vernal pools. Usually in large, or deep vernal pool bottoms; adobe soils. Bloom period: May–August 5–200 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Orcuttia inaequalis San Joaquin Valley Orcutt grass	FT	SE	1B.1	Monocot annual grass found in vernal pools. Bloom period: April–September 10–755m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-1 (cont.): Special-status Plant Species

Scientific Name Common Name	Status			Habitat Description[4]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]	CNPS[3]			
Orcuttia pilosa hairy Orcutt grass	FE	SE	1B.1	Monocot annual grass found in vernal pools. Bloom period: May–September 45–200m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Phacelia ciliata var. *opaca* Merced phacelia	—	—	3.2	Dicot annual herb found in valley and foothill grassland. Adobe or clay soils of valley floors, open hills, or alkaline flats. Bloom period: February–May 60–150 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Sagittaria sanfordii Sanford's arrowhead	—		1B.2	Monocot perennial herb (rhizomatous) found in marshes and swamps. Prefers standing or slow-moving freshwater ponds, marshes, and ditches. Bloom period: May–October 0–650m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Sidalcea keckii Keck's checkerbloom	FE	—	1B.1	Dicot annual herb found in cismontane woodland, valley and foothill grassland. Grassy slopes in blue oak woodland. On serpentine-derived, clay soils, at least sometimes. Bloom period: April–May 85–505 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Tuctoria greenei Greene's tuctoria	FE	CR	1B.1	Monocot annual grass found in vernal pools. Dry bottoms of vernal pools in open grasslands. Bloom period: May–July 30–1,070 m.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-1 (cont.): Special-status Plant Species

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Status CNPS[3]	Habitat Description[4]	Potential to Occur and Rationale	Included in Impact Analysis
Code Designations						
[1]Federal Status: 2015 USFWS Listing			**[2]State Status: 2015 CDFW Listing**		**[3]CNPS: 2015 CNPS Listing**	
FE = Listed as endangered under the Endangered Species Act **FT** = Listed as threatened under the Endangered Species Act **FC** = Candidate for listing (threatened or endangered) under Endangered Species Act **FD** = Delisted in accordance with the Endangered Species Act — = Not federally listed			**SE** = Listed as endangered under the California Endangered Species Act **ST** = Listed as threatened under the California Endangered Species Act **SSC** = Species of Special Concern as identified by CDFW **CFP** = Listed as fully protected under FGC **CR** = Species identified as rare by CDFW — = Not state listed		**1A** = Plants species that presumed extinct in California. **1B =** Plant species that are rare, threatened, or endangered in California and elsewhere. **List 2** = Plant species that are rare, threatened, or endangered in California, but more common elsewhere. **Blooming period:** Months in parentheses are uncommon.	
[4] Habitat description: Habitat description adapted from CNDDB (CDFW 2015), CNPS online inventory (CNPS 2015), and Holland (1986)						

Table 3.4-2: Special-status Wildlife Species

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Habitat Description[3]	Potential to Occur and Rationale	Included in Impact Analysis
Invertebrates					
Branchinecta conservation Conservancy fairy shrimp	FE	—	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-2 (cont.): Special-status Wildlife Species

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]			
Branchinecta lynchi Vernal pool fairy shrimp	FT	—	Found in vernal pools in southern Oregon and parts of California.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Branchinecta mesovallensis midvalley fairy shrimp	—	—	Found in vernal pools in the Central Valley.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Lepidurus packardi Vernal pool tadpole shrimp	FE	—	Found in vernal pools, ponds, reservoirs, ditches, road ruts, and other natural and artificial temporary water bodies. Reproduction occurs when temporary pools fill with water.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Linderiella occidentalis California linderiella	—	—	Found in seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions. Water in the pools must have very low alkalinity, conductivity, and TDS.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Lytta molesta molestan blister beetle	—	—	Inhabits the Central Valley of California, from Contra Costa to Kern and Tulare Counties. No further habitat information available.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Amphibians					
Ambystoma californiense California tiger salamander	FT	—	Frequents grassland, oak savanna, and edges of mixed woodland and lower elevation coniferous forest. Reproduction is aquatic in standing water.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-2 (cont.): Special-status Wildlife Species

Scientific Name Common Name	Status USFWS[1]	Status CDFW[2]	Habitat Description[3]	Potential to Occur and Rationale	Included in Impact Analysis
Spea hammondii western spadefoot	—	SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Reptiles					
Emys marmorata western pond turtle	—	SSC	This species is a thoroughly aquatic turtle found in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation below 6000 feet elevation. Requires basking sites and suitable upland habitat (sandy banks or grassy open fields) up to 0.5 km from water for egg-laying.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Thamnophis gigas giant garter snake	FT	ST	Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals & irrigation ditches. This is the most aquatic of the garter snakes in California.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Birds					
Agelaius tricolor tricolored blackbird	— MBTA	SSC	Highly colonial species, most numerous in Central Valley and its vicinity. Requires open water, protected nesting substrate, and foraging area with insect prey in the vicinity of the colony.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Athene cunicularia burrowing owl	— MBTA	SSC FGC	Found in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. A subterranean nester, dependent upon burrowing mammals, most notably the California ground squirrel.	**Moderate Potential to Occur:** suitable habitat is present within the project, including numerous observed areas with California ground squirrel colonies. No recorded occurrences within 1 mile of the project.	Yes

Table 3.4-2 (cont.): Special-status Wildlife Species

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]			
Buteo regalis ferruginous hawk	— MBTA	— FGC	Found in open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Eats mostly lagomorphs, ground squirrels, and mice. Population trends may follow lagomorph population cycles.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Buteo swainsoni Swainson's hawk	— MBTA	ST FGC	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	**Moderate Potential to Occur:** suitable perching and foraging habitat is present within the project. Two recorded occurrences within 1 mile of the project; most recent occurrence is dated 2008.	Yes
Charadrius montanus mountain plover	MBTA	SSC	Short grasslands, freshly plowed fields, newly sprouting grain fields, & sometimes sod farms. Short vegetation, bare ground & flat topography. Prefers grazed areas & areas with burrowing rodents.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Haliaeetus leucocephalus bald eagle	FD MBTA	SE FP FGC	Occurs along ocean shoreline, lake margins, and rivers for nesting and wintering. Most nests are within one mile of water. Nest in large, old-growth or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	**Unlikely to Occur:** no suitable habitat is present within the project. One recorded occurrence is within 10 miles of the project; recorded occurrence is not dated.	No
Mammals					
Dipodomys heermanni dixoni Merced kangaroo rat	—	—	Grassland and savanna communities in eastern Merced & Stanislaus counties. Needs fine, deep, well-drained soil for burrowing. Granivorous, but also eats forbs & green grasses.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No

Table 3.4-2 (cont.): Special-status Wildlife Species

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]			
Eumops perotis californicus western mastiff bat	—	SSC	Found in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, chaparral. Roosts in crevices in cliff faces, high buildings, trees, and tunnels.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Lasiurus cinereus hoary bat	—	—	Prefers open habitats or habitat mosaics, with access to trees for cover, and open areas or habitat edges for feeding. Roosts in dense foliage of medium-to-large trees. Feeds primarily on moths. Requires a water source nearby.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Myotis yumanensis Yuma myotis	—	—	Found in open forests and woodlands with sources of water for foraging. Distribution is closely tied to bodies of water. Maternity colonies roost in caves, mines, buildings, or crevices.	**Unlikely to Occur:** no suitable habitat is present within the project. No recorded occurrences are within 1 mile of the project.	No
Taxidea taxus American badger	—	SSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Requires sufficient food sources (rodents), friable soils, and open, uncultivated ground. Digs large burrows.	**Low Potential to Occur:** marginal suitable habitat is present within the project, including some observed burrows large enough to support the species. No recorded occurrences are within 1 mile of the project. Nearest recorded occurrence is 7 miles south of the project.	No
Vulpes macrotis mutica San Joaquin kit fox	FE	—	Found in arid climates such as desert scrub, chaparral, and grasslands. Some common habitats include sagebrush and saltbrush.	**Moderate Potential to Occur:** marginal suitable habitat occurs within the project, including some observed burrows large enough to support the species. Four recorded occurrences within 10 miles of the project; the closest is 5 miles east of the project, dated 2001.	Yes

Table 3.4-2 (cont.): Special-status Wildlife Species

Scientific Name Common Name	Status		Habitat Description[3]	Potential to Occur and Rationale	Included in Impact Analysis
	USFWS[1]	CDFW[2]			
Code Designations					
[1]Federal Status: 2015 USFWS Listing			**[2]State Status: 2015 CDFW Listing**		
ESU = Evolutionary Significant Unit is a distinctive population. **FE** = Listed as endangered under the FESA. **FT** = Listed as threatened under the FESA. **FC** = Candidate for listing (threatened or endangered) under FESA. **FD** = Delisted in accordance with the FESA. **FPD** = Federally Proposed to be Delisted. **MBTA**= protected under the MBTA. **—** = Not federally listed			**SE** = Listed as endangered under the CESA. **ST** = Listed as threatened under the CESA. **SSC** = Species of Special Concern as identified by the CDFW. **CFP** = Listed as fully protected under FGC. **CR** = Rare in California. **FGC**= Protected under CA FGC 3503.5. **—** = Not state listed		
[3] **Habitat description:** Habitat description adapted from CNDDB (CDFW 2015).					

3.4.6 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, biological resources impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (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 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?

3.4.7 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Effect on Special Status Species

Impact BIO-1:	**The project could have an adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.**

Impact Analysis

The site contains disturbed open agricultural fields with evidence of disking in the northern section and disturbed land with ruderal weedy species in the southern section. The literature review and analysis found the site is unlikely to support any special-status plant species. As a result, no mitigation for special-status plants is necessary.

There were numerous burrows of various sizes observed during the site review, which were identified as having the potential to support two special-status species: burrowing owl and San

Joaquin kit fox. To determine if these species are present and to minimize impacts, avoidance or pre-construction clearance surveys for burrowing owl will be required, as addressed in Mitigation Measure BIO-1a; avoidance or protocol surveys for San Joaquin kit fox will also be required, as addressed in Mitigation Measure BIO-1b.

There are also numerous recorded occurrences of Swainson's hawk in the project vicinity, and suitable perching and foraging habitat present within the northern section of the site. Suitable nesting habitat is present within the immediate vicinity of the site. To determine if these species are present and to minimize impacts to the species, avoidance or pre-construction clearance surveys for Swainson's hawk will be required, as addressed in Mitigation Measure BIO-1c.

The property contains vegetation (trees, shrubs, and herbaceous vegetation) with the potential to support nesting birds. Impacts to nesting birds are prohibited under the MBTA and FGC. The presence of vegetation with potential to support nesting birds would at most represent a seasonal constraint to construction. Because of the presence of suitable, albeit degraded, habitat on the project site, and because various nesting bird species could potentially move on-site prior to commencement of construction activities, the potential for direct and/or indirect take to occur during the nesting season cannot be entirely dismissed. As a result, avoidance or pre-construction clearance surveys will be required, as addressed in Mitigation Measures BIO-1d and BIO-1e. With the incorporation of mitigation, impacts associated with special-status species is expected to be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM BIO-1a Prior to the first ground-disturbing activities, a qualified biologist shall conduct protocol-level surveys during the breeding season (one site visit between February 15 and April 15 and three between April 15 and July 15, one of which shall be conducted after June 15), at least three weeks apart, in accordance with the 2012 California Department of Fish and Wildlife Staff Report on Burrowing Owl Mitigation (2012 Staff Report). The survey shall include an approximately 500-foot (150-meter) buffer around the project site, where access is permitted. If the surveys are negative, then a letter report shall be prepared documenting the methodology and results within two weeks following the final survey. If the surveys result in negative findings, the project proponent shall conduct a take avoidance survey between 14 days and 30 days prior to commencement of construction, in accordance with the 2012 Staff Report.

If burrows are observed within 500 feet of the project site, an impact assessment shall be prepared and submitted to the California Department of Fish and Wildlife (CDFW), in accordance with the 2012 Staff Report. If it is determined that project activities may result in impacts to nesting, occupied, and satellite burrows and/or burrowing owl habitat, the project proponent shall consult with CDFW and develop

a detailed mitigation plan such that the habitat acreage, number of burrows, and burrowing owls impacted are replaced.

MM BIO-1b Preconstruction/pre-activity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, assess the potential impacts to kit fox by the proposed activity. The status of all dens shall be determined and mapped according to United States Fish and Wildlife Service (USFWS) survey protocol. Written results of preconstruction/ pre-activity surveys must be received by USFWS within 5 days after survey completion and prior to the start of ground disturbance and/or construction activities.

If a natal/pupping den is discovered within the project area or within 200 feet of the project boundary, USFWS shall be immediately notified and under no circumstances shall the den be disturbed or destroyed without prior authorization. Further coordination with USFWS will be necessary to obtain the necessary take authorization/permit.

MM BIO-1c A pre-construction survey for nesting raptors shall be performed in accordance with the survey methodology for Swainson's hawk, prior to any ground disturbance, regardless of when construction will occur.

If ground-disturbing project activities occur during the normal avian breeding season (February 1 through September 15), additional pre-construction surveys for active raptor nests shall be conducted no more than 10 days prior to the start of construction. In an active Swainson's hawk nest is detected within 0.5 mile of the project site and work will occur within the avian nesting season, consultation with CDFW will be necessary to determine if take of Swainson's hawk can be avoided. If take cannot be avoided, further consultation with CDFW will be necessary to acquire an Incidental Take Permit pursuant to California Fish and Game Code Section 2081(b) to comply with CESA.

MM BIO-1d To avoid any potential impact to nesting birds and other protected species, including those protected by the Migratory Bird Treaty Act, construction of the project shall occur outside of the breeding season (February 1 through September 15). As long as trees, shrubs, and herbaceous vegetation with the potential to support nesting birds is removed between September 16 and January 31 (outside of the nesting season) and does not become re-established within the project, then no further actions are required. If the nesting season (February 1 to September 15) cannot be avoided during construction or vegetation is allowed to reestablish itself within the project, Mitigation Measure BIO-1e shall be required.

MM BIO-1e If construction activities must occur during the nesting season (February 1 to September 15), a qualified biologist shall conduct a nesting bird survey within three

days prior to any disturbance of the site, including disking, demolition activities, and grading. The survey area shall include the project site and a 250-foot buffer around the site. Any active nests identified shall have a buffer area established within a 100-foot radius (200-foot radius for birds of prey) of the active nest. Construction activities shall not occur within the buffer area until the biologist determines that the young have fledged.

Level of Significance After Mitigation

Less than significant impact.

Sensitive Natural Communities or Riparian Habitat

Impact BIO-2:	**The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.**

Impact Analysis

No formal jurisdictional delineation surveys have been performed within the project site to evaluate impacts to jurisdictional wetlands, waters, or associated riparian habitat. There is a potential jurisdictional drainage feature present in the southern section along the western boundary, parallel to Coffee Street. As a result, avoidance or jurisdictional delineation surveys will be required prior to development as addressed in Mitigation Measure BIO-2. The amount of mitigation required by the regulatory agencies for impacts to USACE or CDFW jurisdictional areas will be determined during the permitting process as set forth in Mitigation Measure BIO-2.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM BIO-2 To avoid any potential impact to riparian habitat or other sensitive natural community identified, formal jurisdictional delineation surveys shall be performed in the canal area prior to the issuance of grading permits in accordance with survey guidelines set by the United States Army Corps of Engineers (USACE) and CDFW. If jurisdictional wetlands, waters, or riparian habitat are found to be present within the project, consultation with USACE, CDFW, and/or Regional Water Quality Control Board (RWQCB) will be required to determine if avoidance is feasible. If avoidance is not feasible and impacts to jurisdictional wetlands, waters, or riparian habitat may occur, the project shall mitigate unavoidable adverse impacts to waters of the United States, wetlands and riparian habitats (pursuant to the Federal Clean Water Act and the California Fish and Game Code, Section 1600, et seq.) by replacement on an in-kind basis. Furthermore, replacement shall be based on a ratio determined by the CDFW and/or USACE in order to account for the potentially diminished habitat values of replacement habitat. Such replacement should occur on the original development site, whenever possible. Alternatively, replacement can be effected,

subject to state and federal regulatory approval, by creation or restoration of replacement habitats elsewhere (off-site but preferably within the County), protected in perpetuity by provision for an appropriate conservation easement or dedication.

Level of Significance After Mitigation

Less than significant impact.

Federally Protected Wetlands

Impact BIO-3: **The project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.**

Impact Analysis

No formal jurisdictional delineation surveys have been performed within the project site to evaluate impacts to jurisdictional wetlands, waters, or associated riparian habitat. There is a potential jurisdictional drainage feature present in the southern section along the western boundary, parallel to Coffee Street. As a result, avoidance or jurisdictional delineation surveys will be required, as addressed in Mitigation Measure BIO-2. The amount of mitigation required by the regulatory agencies for impacts to USACE or CDFW jurisdictional areas will be determined during the permitting process as set forth in Mitigation Measure BIO-2.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measure BIO-2.

Level of Significance After Mitigation

Less than significant impact.

Wildlife Corridors and Nursery Sites

Impact BIO-4: **The project would not 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 wildlife nursery sites.**

Impact Analysis

The project consists of a large open disturbed agricultural field, bordered by residential development to the north, a major highway further to the west, and open agricultural fields to the south and east. The project contains no rivers, streams, or drainages capable of supporting native resident or migratory fish species; as a result, no impacts to the movement of native resident or migratory fish species are expected to occur. The project vicinity is primarily open fields with some residential development. Although it is likely that local native resident or migratory wildlife species use the

project as a local movement corridor, the project does not consist of an established wildlife corridor, and project activities are not likely to interfere substantially with the movement of native resident or migratory wildlife species or the use of wildlife nursery sites.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Conservation Plans

Impact BIO-5:	**The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.**

Impact Analysis

The project site is not located within any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The East Merced County Habitat Conservation Plan is currently in development, but it has not yet been adopted and is not a CDFW-recognized Habitat Conservation Plan or Natural Community Conservation Plan.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

THIS PAGE INTENTIONALLY LEFT BLANK

3.5 - Cultural Resources

3.5.1 - Introduction

This section describes the existing cultural resources setting including historical and archaeological resources (resources determined eligible for listing in the California Register of Historical Resources [CR]) that could be affected by the proposed project. It presents the methods employed to identify cultural resources, assesses potential impacts to those resources, and presents mitigation measures to address significant impacts. Descriptions and analysis in this section are based on information prepared by Dana DePietro, PhD in December 2015.

3.5.2 - Environmental Setting

Overview

The term "cultural resources" encompasses historic, archaeological, and paleontological resources, and burial sites. Below is a brief summary of each component:

- **Historic Resources:** Historic resources are associated with the recent past. In California, historic resources are typically associated with the Spanish, Mexican, and American periods in the State's history and are generally less than 200 years old.
- **Archaeological Resources:** Archaeology is the study of prehistoric human activities and cultures. Archaeological resources are generally associated with indigenous cultures.
- **Paleontological Resources:** Paleontology is the study of plant and animal fossils.
- **Burial Sites:** Burial sites are formal or informal locations where human remains, usually associated with indigenous cultures, are interred.

Cultural Setting

The following is a brief overview of the prehistoric and historic background of the Merced area, which provides a context to understand the relevance of resources found in the general project area. This section is not intended to be a comprehensive review of the current resources available; rather, it serves as a general overview.

Further details can be found in ethnographic studies, mission records, and major published sources, including Beardsley (1948), Bennyhoff (1950), Fredrickson (1973 and 1974), Kroeber (1925), Chartkoff and Chartkoff (1984), Moratto (1984) and Jones (2007).

Prehistory

Early archaeological investigations in central California were conducted at sites located in the Sacramento–San Joaquin Delta region. The first published account documents investigations in the Lodi and Stockton area (Schenck and Dawson 1929). The initial archaeological reports typically contained descriptive narratives, with more systematic approaches sponsored by Sacramento Junior College in the 1930s. At the same time, the University of California at Berkeley excavated several sites in the lower Sacramento Valley and Delta region, which resulted in recognizing archaeological

site patterns based on variations of inter-site assemblages. Research during the 1930s identified temporal periods in central California prehistory and provided an initial chronological sequence (Lillard and Purves 1936; Lillard, et al. 1939). In 1939, Lillard noted that each cultural period led directly to the next and that influences spread from the Delta region to other regions in central California (Lillard, et al. 1939). In the late 1940s and early 1950s, Beardsley documented similarities in artifacts among sites in the San Francisco Bay region and the Delta and refined his findings into a cultural model that ultimately became known as the Central California Taxonomic System (CCTS). This system proposed a uniform, linear sequence of cultural succession (Beardsley 1948 and 1954). The CCTS system was challenged by Gerow, whose work looked at radiocarbon dating to show that Early and Middle Horizon sites were not subsequent developments, but at least partially contemporaneous (1954; 1974; Gerow with Force 1968).

To address some of the flaws in the CCTS system, Fredrickson (1973) introduced a revision that incorporated a system of spatial and cultural integrative units. Fredrickson separated cultural, temporal, and spatial units from each other and assigned them to six chronological periods: Paleo-Indian (10000 to 6000 B.C.); Lower, Middle and Upper Archaic (6000 B.C. to A.D. 500), and Emergent (Upper and Lower, A.D. 500 to 1800). The suggested temporal ranges are similar to earlier horizons, which are broad cultural units that can be arranged in a temporal sequence (Moratto 1984). In addition, Fredrickson defined several patterns—a general way of life shared within a specific geographical region. These patterns include:

- Windmiller Pattern or Early Horizon (3000 to 1000 B.C.)
- Berkeley Pattern or Middle Horizon (1000 B.C. to A.D. 500)
- Augustine Pattern or Late Horizon (A.D. 500 to historic period)

Brief descriptions of these temporal ranges and their unique characteristics follow.

Windmiller Pattern or Early Horizon (3000 to 1000 B.C.)

Characterized by the Windmiller Pattern, the Early Horizon was centered in the Cosumnes district of the Delta and emphasized hunting rather than gathering, as evidenced by the abundance of projectile points in relation to plant processing tools. Additionally, atlatl, dart, and spear technologies typically included stemmed projectile points of slate and chert but minimal obsidian. The large variety of projectile point types and faunal remains suggests exploitation of numerous types of terrestrial and aquatic species (Bennyhoff 1950; Ragir 1972). Burials occurred in cemeteries and intra-village graves. These burials typically were ventrally extended, although some dorsal extensions are known with a westerly orientation and a high number of grave goods. Trade networks focused on acquisition of ornamental and ceremonial objects in finished form rather than on raw material. The presence of artifacts made of exotic materials such as quartz, obsidian, and shell indicates an extensive trade network that may represent the arrival of Utian populations into central California. Also indicative of this period are rectangular Haliotis and Olivella shell beads, and charmstones that usually were perforated.

Berkeley Pattern or Middle Horizon (1000 B.C. to A.D. 500)

The Middle Horizon is characterized by the Berkeley Pattern, which displays considerable changes from the Early Horizon. This period exhibited a strong milling technology represented by minimally

shaped cobble mortars and pestles, although metates and manos were still used. Dart and atlatl technologies during this period were characterized by non-stemmed projectile points made primarily of obsidian. Fredrickson (1973) suggests that the Berkeley Pattern marked the eastward expansion of Miwok groups from the San Francisco Bay Area. Compared with the Early Horizon, there is a higher proportion of grinding implements at this time, implying an emphasis on plant resources rather than on hunting. Typical burials occurred within the village with flexed positions, variable cardinal orientation, and some cremations. As noted by Lillard, the practice of spreading ground ochre over the burial was common at this time (Lillard, et al. 1939). Grave goods during this period are generally sparse and typically include only utilitarian items and a few ornamental objects. However, objects such as charmstones, quartz crystals, and bone whistles occasionally were present, which suggest the religious or ceremonial significance of the individual (Hughes 1994). During this period, larger populations are suggested by the number and depth of sites compared with the Windmiller Pattern. According to Fredrickson (1973), the Berkeley Pattern reflects gradual expansion or assimilation of different populations rather than sudden population replacement and a gradual shift in economic emphasis.

Augustine Pattern or Late Horizon (A.D. 500 to Historic Period)

The Late Horizon is characterized by the Augustine Pattern, which represents a shift in the general subsistence pattern. Changes include the introduction of bow and arrow technology; and most importantly, acorns became the predominant food resource. Trade systems expanded to include raw resources as well as finished products. There are more baked clay artifacts and extensive use of Haliotis ornaments of many elaborate shapes and forms. Burial patterns retained the use of flexed burials with variable orientation, but there was a reduction in the use of ochre and widespread evidence of cremation (Moratto 1984). Judging from the number and types of grave goods associated with the two types of burials, cremation seems to have been reserved for individuals of higher status, whereas other individuals were buried in flexed positions. Johnson (1976) suggests that the Augustine Pattern represents expansion of the Wintuan population from the north, which resulted in combining new traits with those established during the Berkeley Pattern.

Central California research has expanded from an emphasis on defining chronological and cultural units to a more comprehensive look at settlement and subsistence systems. This shift is illustrated by the early use of burials to identify mortuary assemblages and more recent research using osteological data to determine the health of prehistoric populations (Dickel et al. 1984). Although debate continues over a single model or sequence for central California, the general framework consisting of three temporal/cultural units is generally accepted, although the identification of regional and local variation is a major goal of current archaeological research.

Native American Background

The project vicinity is within the territory of the Yokuts, a large Native American group of at least 40 tribes, who once occupied the San Joaquin Valley from the mouth of the San Joaquin River south to the Tehachapi foothills near Bakersfield. Their language, though divided into many dialects, is part of the Penutian family of languages. Two main dialects divided the inhabitants of the valley into Northern and Southern groups, though the differences in local dialects along the valley floor are

slight enough that Yokuts from Stockton could probably have understood Yokuts from Bakersfield. This similarity of language over a large area is unique in California (Kroeber 1925).

The Northern Valley Yokuts, who lived along the San Joaquin River and its tributaries and within the vicinity of the Project Area, are one of the least known California Indian groups. This is due to the almost complete destruction of tribal life in the early 19th century. What can be gleaned from the diaries and reports of Spanish soldiers and priests is that fish, waterfowl, and acorns were important food resources for the Northern Valley Yokuts. The Fresno River and its tule marshes contained salmon, sturgeon, perch, suckers, and pike, which were caught using nets, weighted with stone sinkers and bone harpoons. Waterfowl, such as geese, ducks, and other aquatic birds, were abundant in the marshes and probably played a major role in the Northern Valley Yokuts subsistence base (Wallace 1978). Dogs were domesticated and may have been raised for food, a taboo to some tribes but not the Yokuts (Wallace 1978; Kroeber 1925). Wild plant resources, especially acorns, were of prime importance and in a good year, a valley oak could produce 300 to 500 pounds of acorns, which were then ground into meal and cooked into porridge. Tule reed roots were likewise gathered and ground into meal that was traditionally served as porridge (Wallace 1978).

Stone mortars and pestles, milling stones, hammers, choppers, and projectile points were manufactured from local rock. It is interesting to note that although obsidian was imported into the area, it was used infrequently for tools or weapons. Bone tools, particularly awls, were used in basket manufacture (Wallace 1978).

Most villages were built near rivers on elevated land to avoid flooding during heavy rains or spring runoff from the Sierras. Archaeological excavation in Merced and Fresno counties indicates that houses were single-family dwellings, probably made of an oval framework of lightweight poles covered by mats of tule reeds. Hard-packed earthen floors 25 to 40 feet in diameter were constructed several feet below ground level. Communities typically contained a sweathouse and sometimes a large ceremonial structure. The size of the Yokuts communities is uncertain, but estimates indicate that the principal settlements contained 200-250 inhabitants (Wallace 1978).

Contact with Europeans was particularly devastating for the Northern Valley Yokuts. This group was adversely impacted by missionization in the early 1800s, European diseases, and the influx of miners and settlers as a result of the 1849 Gold Rush (Wallace 1978). Kroeber observed that their habitat in the open river valley left them especially vulnerable, compared to mountain dwellers, to “the full brunt of civilization” (Kroeber 1925).

Contact with the Spanish commenced early in the 19th century and normally consisted of sporadic visits by small exploration parties. However, between 1805 and the 1820s, Franciscan priests from the coastal missions began recruiting converts from further inland, and a large portion of the Yokuts population was taken to various missions in San Jose, Santa Clara, Soledad, San Juan Bautista, and San Antonio. Many neophytes deserted and returned to their homes, but were sought and brought back by Spanish soldiers. A decade after the Mexican government claimed independence from Spain in 1822, the missions were converted into parish churches, and many Native Americans were released and returned to their former territory, though not necessarily to the specific location from which they came.

After the American conquest of California in 1846, the remaining Northern Valley Yokuts were driven off their land by miners heading south, farmers pursuing the locally rich soil, and the construction of various railroads. By the time scholars were interested in gathering information on California native groups, there were few people left to provide descriptions of native life before European contact (Wallace 1978).

Historic Background

The earliest historical record for the area of Merced was the expedition led by Lieutenant Gabriel Moraga in 1806. The purpose of the expedition was to look for land suitable to establish missions and presidios in the interior regions of California and to control horse-thieving activities in the Central Valley. At the end of the expedition, Lieutenant Moraga reported that the "area was unfit for farming" and recommended against establishing a mission or presidio in the area.

Control of California passed from Spanish to Mexican rule in 1822. During this time, large parcels of land were deeded to citizens for cattle raising and farming. There are records of four land grants issued in Merced County, the earliest of which was the San Luis Gonzaga Grant of 48,000 acres in 1834. None of the land grants of the Merced area included the project site. The closest land grant to the project area is the Sanjon de Santa Rita located in the City of Fresno, approximately 20 miles away (Beck and Haase 1974).

By 1850, rapid changes were taking place in the San Joaquin Valley and throughout California. The discovery of gold in the Sierra Nevada foothills brought an influx of miners to the cities of northern California, and with them, the demand for meat and other goods. As a result of rising cattle prices, cattle ranching became a major industry in the Merced area in the late 1850s. Two of the great cattle ranchers of the time were Miller and Lux, who collectively owned millions of acres in California, Nevada, and Oregon. Their largest holdings, 350,000 acres, were in Merced and Madera counties. The arrival of midwestern beef, the floods of 1861 and 1862, and the following drought, along with a rise in sheep ranching, collectively brought the price of cattle down, causing many ranchers to lose their herds (Monterey County Historical Society 2006).

The decline in cattle ranching fostered a significant rise in grain production in the area. The change from cattle to grain was punctuated by the No Fence Law of 1872. Prior to the No Fence Law, farmers were required to fence their crops to protect them from grazing cattle. The law shifted the burden of fencing to cattle ranchers who were now required to fence their herds. Two prominent figures in the agricultural community of the San Joaquin Valley were John Mitchell and Marshall Atwater. Mitchell moved to California in 1851 and eventually amassed 500,000 acres of land, including 117,000 acres near Merced. To maintain the land, Mitchell leased the land in 2,000-acre parcels. One of the leaseholders was Atwater, the namesake for the town of Atwater, who bought 4,480 acres from Mitchell and raised grain, fruit, and livestock. In 1852, the San Joaquin Valley produced approximately 113,000 bushels of wheat, and by 1874, the valley was producing seven and one-half million bushels (Merced Chamber of Commerce 2006).

The Central Pacific Railroad completed its railroad line through Merced County in 1872, shifting the focus of transportation from wagons to the railroad. The City of Merced was the location of the Yosemite Valley Railroad Station, which was completed in 1902 and brought visitors to Yosemite

National Park until 1945. The Yosemite Valley Railroad Station survives today and can be found at R and 18th streets, approximately 5 miles from the project site (Yosemite Valley Railroad 2006).

Local History

Merced County was formed from the southwestern portion of Mariposa County in April of 1855, with a population of 500 people residing in the area. The first county seat was located on a ranch owned by Turner and Osborne on Mariposa Creek. In 1872, a special election was held and the county seat was moved to the City of Merced. The Merced County courthouse was dedicated in May 1875 and is one of the oldest historical buildings in California (Merced Chamber of Commerce 2006).

The City of Merced continued to grow, and although agriculture was the economic base of the community, other industries contributed as well. The California Pottery Company, built in 1921, manufactured a variety of clay products and was considered one of the top five industries in the City until it closed down in 1929, during the Great Depression. Castle Air Force Base, located approximately 11 miles from the project site, opened in 1941 and closed in 1995; it was a key economic presence in the City of Merced during that time (Merced County Courthouse Museum 2006).

The City of Merced was selected to be the home of a new California University in May of 1995, and in 2005 the University of California, Merced enrolled its first 1,000 students. Rapid population growth over the last 20 years has led to a diversified economy that includes printing, fiberglass boat manufacturing, warehousing, and distribution and packaging industries (City of Merced 2006).

3.5.3 - Regulatory Framework

Federal

National Historic Preservation Act

The National Historic Preservation Act of 1966 (NHPA), as amended, established the National Register of Historic Places (NRHP), which contains an inventory of the nation's significant prehistoric and historic properties. Under 36 CFR 60, a property is recommended for possible inclusion on the NRHP if it is at least 50 years old, has integrity, and meets one of the following criteria:

- It is associated with significant events in history, or broad patterns of events.
- It is associated with significant people in the past.
- It embodies the distinctive characteristics of an architectural type, period, or method of construction; or it is the work of a master or possesses high artistic value; or it represents a significant and distinguishable entity whose components may lack individual distinction.
- It has yielded, or may yield, information important in history or prehistory.

Certain types of properties are usually excluded from consideration for listing in the NRHP, but they can be considered if they meet special requirements in addition to meeting the criteria listed above. Such properties include religious sites, relocated properties, graves and cemeteries, reconstructed

properties, commemorative properties, and properties that have achieved significance within the past 50 years.

State

California Register of Historical Resources

As defined by Section 15064.5(a)(3)(A-D) of the CEQA Guidelines, a resource shall be considered historically significant if the resource meets the criteria for listing on the CR. The CR and many local preservation ordinances have employed the criteria for eligibility to the NRHP as a model, since the NHPA provides the highest standard for evaluating the significance of historic resources. A resource that meets the NRHP criteria is clearly significant. In addition, a resource that does not meet the NRHP standards may still be considered historically significant at a local or state level.

California Environmental Quality Act

The CEQA Guidelines state that a resource need not be listed on any register to be found historically significant. The CEQA guidelines direct lead agencies to evaluate archaeological sites to determine if they meet the criteria for listing in the California Register. If an archaeological site is a historical resource, in that it is listed or eligible for listing in the California Register, potential adverse impacts to it must be considered. If an archaeological site is considered not to be a historical resource but meets the definition of a "unique archeological resource" as defined in Public Resources Code Section 21083.2, then it would be treated in accordance with the provisions of that section.

An archaeological site may be considered a historical resource if it is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California per PRC § 5020.1(j) or if it meets the criteria for listing on the CR per California Code of Regulations (CCR) at Title 14 CCR § 4850.

The most recent amendments to the CEQA guidelines direct lead agencies to first evaluate an archaeological site to determine if it meets the criteria for listing in the CR. If an archaeological site is a historical resource, in that it is listed or eligible for listing in the CR, potential adverse impacts to it must be considered as stated in PRC §§ 21084.1 and 21083.2(l). If an archaeological site is considered not to be a historical resource, but meets the definition of a "unique archeological resource" as defined in PRC § 21083.2, then it would be treated in accordance with the provisions of that section.

Title 14, CCR, Chapter 3 § 15064.5 is associated with determining the significance of impacts to archaeological and historical resources. Here, the term historical resource includes the following:

1. A resource listed in, or determined eligible by the State Historical Resources Commission, for listing in the CR (PRC § 5024.1; Title 14 CCR, § 4850 et seq.).
2. A resource included in a local register of historical resources, as defined in PRC § 5020.1(k) or identified as significant in an historical resource survey meeting the PRC § 5024.1(g) requirements, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. Any object, building, structure, site, area, place, record, or manuscript, which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the California Register of Historical Resources (PRC § 5024.1; Title 14 CCR § 4852) including the following:
   A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
   B. Is associated with the lives of persons important in our past.
   C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
   D. Has yielded, or may be likely to yield, information important in prehistory or history.

Senate Bill 18

California Senate Bill 18 (SB 18) states that prior to a local (city or county) government's adoption of any general plan or specific plan, or amendment to general and specific plans, or a designation of open space land proposed on or after March 1, 2005, the city or county shall conduct consultations with California Native American tribes for the purpose of preserving or mitigating impacts to Cultural Places. A Cultural Place is defined as:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine (PRC Section 5097.9), or;
- Native American historic, cultural, or sacred site, that is listed or may be eligible for listing in the California Register of Historical Resources pursuant to Section 5024.1, including any historic or prehistoric ruins, any burial ground, or any archaeological or historic site (PRC Section 5097.995).

According to the Government Code (GC) Section 65352.4, "consultation" is defined as:

> The meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties' cultural values and, where feasible, seeking agreement. Consultation between government agencies and Native American Tribes shall be conducted in a way that is mutually respectful of each party's sovereignty. Consultation shall also recognize the tribes' potential needs for confidentiality with respect to places that have traditional tribal cultural significance.

While consultation is required to take place on a government-to-government level, the SB 18 process begins with a letter from the local government to the Native American Heritage Commission requesting a list of tribal organizations appropriate to the plan or plan amendment area or proposed

open space designation. Once contacted by the local government, the tribes have up to 90 days to respond and request consultation regarding the preservation and treatment of known cultural place(s), if any have been identified by the tribe.

Assembly Bill 52 (AB 52)

Assembly Bill 52 was signed into law on September 25, 2014, and provides that any public or private "project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment." Tribal cultural resources include "[s]ites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are eligible for inclusion in the California Register of Historical Resources or included in a local register of historical resources."

This law applies to any project that has a notice of preparation, a notice of negative declaration, or mitigated negative declaration filed on or after July 1, 2015. Under prior law, tribal cultural resources were typically addressed under the umbrella of "cultural resources," as discussed above. AB 52 formally added the category of "tribal cultural resources" to CEQA, and extends the consultation and confidentiality requirements to all projects, whether they involve adoption of, or changes to, general plans or specific plans.

The parties must consult in good faith, and consultation is deemed concluded when either the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource (if such a significant effect exists) or when a party concludes that mutual agreement cannot be reached. Mitigation measures agreed upon during consultation must be recommended for inclusion in the environmental document. AB 52 also identifies mitigation measures that may be considered to avoid significant impacts if there is no agreement on appropriate mitigation. Recommended measures include:

- Preservation in place
- Protecting the cultural character and integrity of the resource
- Protecting the traditional use of the resource
- Protecting the confidentiality of the resource
- Permanent conservation easements with culturally appropriate management criteria.

Local

Merced County General Plan

The Recreation and Cultural Resources chapter of General Plan 2030 contains the following goals, policies and actions related to the protection of cultural resources. These policies call for the preservation, restoration, and compatible reuse of historically significant structures and sites.

- **Goal RCR-2**: Protect and preserve the cultural, archaeological, and historical resources of the County in order to maintain its unique character.
- **Policy RCR-2.1 Archaeological Site and Artifact Protection**: Require development projects that affect archaeological sites and artifacts to avoid disturbance or damage to these sites.

- **Policy RCR-2.2 Historical Area Preservation**: Support the preservation of historical structures and areas, particularly those listed on the National Register of Historic Places and the California Register of Historic Places.
- **Policy RCR-2.3 Architectural Character Preservation**: Require that the original architectural character of significant State and Federally listed historic structures be maintained in compliance with preservation standards and regulations.
- **Policy ROS-2.4 Park and Open Space Historic Resource Preservation**: Require the preservation of historic resources located in parks and publicly-owned open space areas.
- **Policy RCR-2.5 Human Remains Discovery**: Require that, in the event of the discovery of human remains on any project construction site, all work in the vicinity of the find will cease and the County Coroner and Native American Heritage Commission will be notified.
- **Policy RCR-2.6 Historic Buildings and Areas**: Identify and preserve buildings and areas with special and recognized historic, architectural, or aesthetic value during the Community Plan update process. New development should respect architecturally and historically significant buildings and areas.
- **Policy RCR-2.7 Historic Preservation**: Support the efforts of local preservation groups and community property owners to preserve or improve building facades and exteriors consistent with the historic and visual character of the specific building or area.

City of Merced

The City of Merced has adopted the following cultural resources conservation goals, policies and guidelines:

- Initiate and maintain an inventory of cultural, historic, and architecturally significant resources within the City and the planning area.
- Encourage programs and persons to maintain or restore historic or architecturally significant structures.
- Encourage the County and other public agencies to preserve and develop historic features within the planning area.
- Investigate and consider the possibility of using historic overlay zones in conjunction with an historic preservation ordinance to control the use or modification of significant historic areas in the community.
- Support both private and public efforts to preserve and rehabilitate historic structures in the City. This should include the need to preserve or protect a site of historical or architectural significance from intrusion of surrounding land uses which are uncomplimentary or incompatible with the older structures.
- Initiate a program or support other programs which designate historic landmarks and architecturally significant structures in the community.

3.5.4 - Methodology

FirstCarbon Solutions (FCS) conducted a Cultural Resource Assessment for the proposed project area that included record search reviews and a field survey of the proposed area. The components of the assessment included a record search at the Central California Information Center, a search of the Native American Heritage Commission's Sacred Lands file, a search of the University of California Museum of Paleontology (UCMP) Database, outreach to the Merced County Historical Society and a field survey of the project location.

UCMP Database Search Results

On October 18, 2015, Kenneth L. Finger, PhD conducted a search of the University of California, Berkeley's Museum of Paleontology database. The search identified six vertebrate localities in the Modesto Formation in Fresno, Stanislaus, and Yolo counties, and nine in the Riverbank Formation in Fresno, Madera, Merced, Sacramento, and Stanislaus counties. The sole locality in Merced County yielded Rancholabrean fauna; however, it is located 8 miles east of the project area and no paleontological resources have been discovered in the vicinity of the project site (Appendix E.)

Northwest Information Center Record Search Results

On October 13, 2015, a records search was conducted by staff at the Central California Information Center (CCIC), located at California State University, Stanislaus, California. The record search included the project area and a 0.50-mile radius outside the project area boundaries. The record search included current inventories of the NRHP, the CR, the California Inventory of Historical Resources, California State Historic Landmarks, and the California Points of Historical Interest. A review of historic 7.5-minute topographic maps dating to 1948 indicate the project area at that time consisted of agricultural fields, with a small farmstead or agricultural structure (no longer present) located along the northern edge of the project area. An earthen irrigation/drainage ditch is depicted on the map running east-west across the north of the project area. A 1962 topographic map depicts residential development in parcels to the west and north of the project area; however, the project area remains unchanged. These features are confirmed by historic aerial photographs of the project area dating to 1946, and seem associated with agricultural activities taking place at the site. Historic aerial photos also confirm that the structure was completely demolished between the years of 2005 and 2009, during which the drainage ditch fell into disuse.

Nineteen studies have been conducted within the 0.50-mile search radius (Table 3.5-1). Thirteen of the studies included the portions of the project APE (ME-00664, ME-02418, ME-02522, ME-03614, ME-03786, ME-03834, ME-04097, ME-04097, ME-04384, ME-04772, ME-04773, ME-04775, ME-04776, and ME-006857). An additional six studies have been conducted within the 0.50-mile search radius (ME-02930, ME-04042, ME-05420, ME-06345, ME-06839, and ME-06966).

Table 3.5-1: Studies within the Project Area and a 0.50-Mile Radius

Report Number	Additional Details
ME-00644	**Napton; 1989—Assessed the project area in its entirety**
ME-02418	**Napton; 1994—Assessed the project area in its entirety**

Table 3.5-1 (cont.): Studies within the Project Area and a 0.50-Mile Radius

Report Number	Additional Details
ME-02522	**Niroumand, Espinosa and Block; 1994—Assessed the project area as part of a Master Environmental Assessment for the City of Merced**
ME-02930	Jensen; 1996—Did not asses the project area
ME-03614	**Laylander and Silva; 1999—Assessed southern portions of the project area**
ME-03786	**Wilson and Van Bueren; 1999—Assessed central portions of the project area**
ME-03834	**Daylander, et. al.; 1999—Assessed central portions of the project area *****
ME-04042	Pastron; 2000—Did not asses the project area
ME-04097	**Daylander, Chick and Silva; 2000—Assessed southern and central portions of the project area**
ME-04384	**URS Corporation, et. al.; 2001—Assessed central portions of the project area**
ME-04772	**Cardiff, et. al.; 1999—Assessed the southern portions of the project area**
ME-04773	**Caltrans District 10; 1999—Assessed the southern portions of the project area**
ME-04775	**Eastman and Hupp; 1999—Assessed central portions of the project area**
ME-04776	**Welch; 2000—Assessed western portions of the project area**
ME-05420	Peak and Associates; 2004—Did not asses the project area
ME-06345	SWCA Environmental Consultants; 2006—Did not asses the project area
ME-06839	Monastero and Baloian; 2008—Did not asses the project area
ME-06857	**Wills; 2008—Assessed eastern portions of the project area**
ME-06966	JRP Historical Consulting Services; 2001—Did not asses the project area

Note:
Bold = Reports that addressed the project site
Source: CCIC, 2015.

Seventeen resources have been recorded within the 0.50-mile search radius (Table 3.5-2). All resources are of historic age, of which only P-24-000603 is cross-listed as a prehistoric resource since it contained lithic isolates. Of the 17 resources, only P-24-001909, a historic district composed of numerous water conveyance and storage structures, lies within the boundaries of the project area.

Table 3.5-2: Resources within the Project Area and a 0.50-Mile Radius

Primary Number	Recorded By/Year	Summary
P-24-000096	C. Woodward (JRP), 1994	Farmdale Lateral; a canal segment of historic age. The resource is located to the east of the project area.
P-24-000097	C. Brewer and W. Konman, (Caltrans), 2005	Southern Pacific Railroad Line. The resource runs northwest to southeast and lies to the Southwest of the project area.

Table 3.5-2 (cont.): Resources within the Project Area and a 0.50-Mile Radius

Primary Number	Recorded By/Year	Summary
P-24-000596	B. Stillman, D. Cardiff, and T. Mills, (Caltrans), 1999	CA-MER-000353H—Alfarata Dairy Farm; A dairy farm of historic age (no longer present). The resource lies to the northeast of the project area.
P-24-000598	B. Eastman and B. Stillman (Caltrans), 1999	CA-MER-000355H—De Roos Complex and site of Ted's Market; structure of historic age. The resource lies to the south of the project area.
P-24-000602	T. Mills, B. Stillman, and D. Cadiff (Caltrans), 1999	CA-MER-000359H—The Chavez Site; farm buildings of historic age. The resource lies to the south of the project area.
P-24-000603	T. Mills, B. Stillman, and D. Cadiff (Caltrans), 1999	CA-MER-000360H—Single family property of historic age and lithic isolates. The resource lies to the south of the project area.
P-24-000604	T. Mills, B. Stillman, and D. Cadiff (Caltrans), 1999	CA-MER-000361H—Tony Tinos Market and houses; Multi-family property of historic age. The resource lies to the south of the project area.
P-24-000605	T. Mills, B. Stillman, and D. Cadiff (Caltrans), 1999	CA-MER-000362H—Building foundations of historic age. The resource lies to the south of the project area.
P-24-000614	T. Mills, B. Stillman, and D. Cadiff (Caltrans), 1999	OHP Property #125239—Single family property of historic age. The resource lies to the south of the project area.
P-24-000615	T. Mills, B. Stillman, and D. Cadiff (Caltrans), 1999	OHP Property #125241—Multi-family property of historic age. The resource lies to the south of the project area.
P-24-001713	D.W. Dodd (Caltrans), 1999	OHP Property #125248—Bridge 39-99R; bridge of historic age. The resource lies to the east of the project area.
P-24-001716	D.W. Dodd (Caltrans), 1999	OHP Property #125249—Bridge 39-100; bridge of historic age. The resource lies to the east of the project area.
P-24-001884	B. Larson and C. Cannon (JRP), 2000	Hartley Lateral; a canal segment of historic age. The resource is located to the north of the project area.
P-24-001886	B. Larson and C. Cannon (JRP), 2000	CA-MER-000456H Doane Lateral; a canal segment of historic age. The resource is located to the northeast of the project area.
P-24-001909	**S. Loftus (Ace Envir.), 2011**	**Merced Irrigation District; Historic district composed of numerous water conveyance and storage structures. The project area contains a drainage ditch that is associated with this historic district.**
P-24-001930	C. Wills (MBA), 2006	MBA# 1; Farmhouse and dairy barn of historic age (no longer present). The resource is located to the northeast of the project area.
Source: CCIC, 2015.		

Outreach and Coordination with Potentially Interested Parties

On October 15, 2015, FCS sent a letter to the Native American Heritage Commission (NAHC) to determine if any sacred sites are listed on its Sacred Lands File within the project area. A response was received on October 22, 2015, stating the search failed to indicate the presence of tribal cultural resources (TCRs) within the project area. The letter also included a list of California Native American Tribal Representatives who may be interested in consulting on the project pursuant to Public Resources Code Section 21080.3.1 and 21080.3.2 (AB 52).

On October 13, 2015, the City of Merced sent a Notice of Preparation including project maps and details to three tribal representatives who had been listed by the City as having a potential interest in the project under SB 18. On January 28, 2016, the City sent a second letter to these representatives as well as to the additional representatives listed by the NAHC, providing project descriptions, maps, details, and notification of the 30-day period in which they must initiate consultation under AB-52, if desired. As of this date, no responses have been received.

A letter containing project maps and details was also sent to the Merced County Historical Society on October 15, 2015 inquiring as to whether the society had any additional information about the project area. As of this date, no responses have been received.

Pedestrian Survey

FCS Professional Archaeologist Dana DePietro, PhD surveyed the project area for cultural resources on December 17, 2015. Dr. DePietro has more than 15 years' experience directing archaeological surveys and excavations. He meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric and historical archaeology.

The project area is a perfectly rectangular land parcel bordered by East Gerard Avenue to the north, South Coffee Street to the west, and East Mission Street to the south. Campus parkway bisects the lower two-thirds of the project area, crossing from east to west. The project area consists almost entirely of vacant farmland, with residential developments to the north and south, Pioneer Elementary School to the west, and more vacant farmland to the east (Appendix E: Photographs 1–8).

Beginning in Northeast corner of the project area, the survey covered the project area in its entirety from north to south using east-west transects approximately 15 meters apart. In this manner, exposed soils and sediments across the entire project area were examined for changes in color, texture, presence of historic and prehistoric artifacts and features, among other indicators of past use or occupation. The project area was largely covered with vegetation; however, the fields had recently been tilled which provided increased soil visibility of 20 to 40 percent. Soils in the north consisted of light tan silt with low clay content, while soils in the south consisted of darker brown loam. The entire area was evenly interspersed with small to medium (5 to 10 centimeters) chert, chalk, basalt, and quartz stones. Many stones were smooth, indicating the presence of moving water in the area at some point. No raw materials used in the manufacture of prehistoric tools, such as Franciscan chert, were observed (Photographs 9–10).

Two potential features associated with the past use of the area were discovered in the north of the project area. These are the remains of a small structure and an earthen irrigation ditch known to have been present in 1946 that were demolished and went out of use between 2005 and 2009. A power pole and three trees once associated with the structure are present; however, upon inspection, the debris pile is highly disturbed and is interspersed with large amounts of modern refuse apparently created in recent years by a bulldozer. No materials of historic age were immediately apparent. The drainage ditch lies to the southeast of the refuse pile. It emerges from the adjacent agricultural property to the east and runs approximately 250 feet west before entering a submerged pipe. It appears the majority of the original earthen structure, which originally ran across the entire land parcel, was modified to run underground in sections before falling into disuse. The ditch and associated pipes are now overgrown, highly eroded and in a state of total disrepair (Photographs 11–12).

The field survey did not result in discovery of any additional historic resources, nor were any prehistoric resources discovered within the project area. The two potentially historic-age resources observed during the pedestrian survey do not appear to meet the eligibility criteria for listing on the CR (see below). Only the drainage ditch, which is considered a non-contributing element to historic irrigation district P-24-001909, retained adequate integrity for recordation on a DPR Primary form (Appendix E).

3.5.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, cultural resources impacts resulting from the implementation of the proposed project would be considered significant if the project would:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

d) Disturb any human remains, including those interred outside of formal cemeteries?

3.5.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Historic Resources

Impact CUL-1: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered historic resources.

Impact Analysis

Results of the Cultural Resources Assessment indicated that while no historic resources were on file at the CCIC for the project area, a small structure and irrigation ditch built prior to 1946 existed in the north of the project area. The structure was demolished and the ditch went out of use sometime between 2005 and 2009. The demolished structure lacks the integrity to be considered a historic resource for the purposes of CEQA, and does not constitute a historical resource that will be adversely impacted by the proposed project. With regard to the irrigation ditch; however, the project area is located within the boundaries of Historic District P-24-001909: The Merced Irrigation District (MID). The MID was incorporated in 1919 and consists of over 750 miles of canals that irrigate more than 110,000 acres. As such, the irrigation ditch may be considered to be part of the MID and has the potential to be a historical resource and contributing element to the MID.

Title 14, CCR, Chapter 3 § 15064.5 outlines the four criteria for historical significance and eligibility for inclusion on the CR. Under Criterion A, the drainage ditch does not have important associations with events or patterns of events that are important to our history. The practice of constructing such ditches was already well established by the ditch's construction in the 1940s and this very small segment (approximately 640 feet) did not result in major changes to land use in the region. The drainage ditch does not appear on any local listings and is not eligible for listing in the CR under Criterion A and is not considered a historic resource for the purposes of CEQA. Under Criterion B, a property must be associated with an important person's productive life and must be the property that is most closely associated with that person, qualities rarely found in engineering features. Research did not reveal any individuals important in irrigation planning, construction, or engineering related to the construction of the irrigation ditch. Therefore, the ditch is not eligible for listing in the CR under Criterion B and is not considered a historic resource for the purposes of CEQA.

Under Criterion C, the drainage ditch is not important for its design, engineering, or method of construction. Examples of other irrigation ditches reveal that this ditch does not represent an unusual, exceptional, or innovative design. The drainage ditch is not eligible for listing in the CR under Criterion C and is not considered a historic resource for the purposes of CEQA.

Under Criterion D, a property must be likely to yield information important in history or prehistory. In order to be eligible under this criterion, the potential important information must be from the physical properties themselves. A relevant example would be if the irrigation ditch held potential information about construction techniques. Construction of such ditches are well documented, therefore, the irrigation ditch is not eligible for listing in the CR under Criterion 4 and is not considered a historic resource for the purposes of CEQA.

In addition to lacking historic significance, the drainage ditch also lack integrity. The recent piping and filling of segments of the ditch as well as routine maintenance and excavation compromise its integrity of design, materials, and workmanship. The drainage ditch is therefore ineligible for listing

on the CR and does not constitute a historical resource that will be adversely impacted by the proposed project. Overall, the potential for the project to have an adverse effect on historical resources is low.

Nonetheless, subsurface construction activities have the potential to damage or destroy previously undiscovered historic resources. Historic resources can include wood, stone, foundations, and other structural remains; debris-filled wells or privies; and deposits of wood, glass, ceramics, and other refuse. Therefore, implementation of standard cultural resource construction mitigation (Mitigation Measure [MM] CUL-1) would reduce impacts to a level of less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM CUL-1 In the event that buried historic or archaeological resources are discovered during construction, operations shall stop within 50 feet of the find and a qualified archaeologist shall be consulted to evaluate the resource in accordance with CEQA Guidelines 15064.5. The applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. If the resource does not qualify as a significant resource, then no further protection or study is necessary. If the resource does qualify as a significant resource then the impacts shall be avoided by project activities. If the resource cannot be avoided, adverse impacts to the resource shall be addressed. The archaeologist shall make recommendations concerning appropriate mitigation measures that shall be implemented to protect the resources, including but not limited to excavation and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. Any previously undiscovered resources found during construction within the project area should be recorded on appropriate Department of Parks and Recreation (DPR) 523 forms and evaluated for significance in terms of CEQA criteria.

Level of Significance After Mitigation

Less than significant impact.

Archaeological Resources

Impact CUL-2:	**Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered archaeological resources.**

Impact Analysis

The results of the Cultural Resources Assessment indicated that there were no records of archaeological resources or evidence of such resources in the project area. Furthermore, the project area has been surveyed in its entirety several times, including the most recent pedestrian survey conducted in December of 2015. All surveys, along with inquiries made to the NAHC and Tribal representatives failed to identify any prehistoric archaeological resources or TCRs in the project area. The likelihood of the project impacting these resources is therefore low.

The records search and pedestrian survey revealed that a small structure existed in the north of the project area prior to 1946, and was demolished between 2005 and 2009. Upon inspection during the pedestrian field survey, the location of the demolished structure was found to contain an earthen mound containing modern refuse and debris, apparently moved into place by a bulldozer. Aside from a utility pole and associated trees, no evidence of the structure, or any materials of historic age were present at the location. Furthermore, the site is highly disturbed, and has continually been used as a trash dump for modern debris.

While the likelihood of encountering historic or prehistoric archaeological resources is considered low, subsurface construction activities have the potential to damage or destroy previously undiscovered historic and prehistoric resources. Prehistoric resources can include flaked-stone tools (e.g., projectile points, knives, and choppers) or obsidian, chert, or quartzite toolmaking debris; culturally darkened soil (such as midden soil containing heat-affected rock, ash, and charcoal, shellfish remains, and animal bones); and stone milling equipment (e.g., mortars, pestles, handstones). Accordingly, implementation of Mitigation Measure CUL-1 will be required to reduce potential impacts to historic resources that may be discovered during project construction. With the incorporation of mitigation, impacts associated with historic resources would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measure CUL-1.

Level of Significance After Mitigation

Less than significant impact.

Paleontological Resources

Impact CUL-3: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered paleontological resources.

Impact Analysis

According to a UCMP database records search conducted by Dr. Kenneth L. Finger, the search identified six vertebrate localities in the Modesto Formation in Fresno, Stanislaus, and Yolo Counties, and nine in the Riverbank Formation in Fresno, Madera, Merced, Sacramento, and Stanislaus counties. The sole locality in Merced County yielded Rancholabrean fauna; however, it is located 8 miles east of the project area and no paleontological resources have been discovered in the vicinity of the project site. The project's potential to impact significant paleontological resources is considered low, because vertebrate fossil occurrences in alluvium tend to be spottily distributed, primarily in pointbar and floodplain deposits.

Although impacts to known paleontological resources are unlikely to occur during development of the project, all Pleistocene alluvium should be considered as having a high paleontological sensitivity, and subsurface construction activities occurring at depths of 10 feet or deeper may have the

potential to damage or destroy previously undiscovered paleontological resources. Paleontological resources may include but are not limited to fossils from mammoths, saber-toothed cats, rodents, reptiles, and birds. Accordingly, implementation of Mitigation Measure CUL-3 will be required to reduce potential impacts to paleontological resources that may be discovered during project construction. With the incorporation of mitigation, impacts associated with paleontological resources would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM CUL-3 In the event that fossils or fossil-bearing deposits are discovered during construction activities, excavations within a 50-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to resume at the location of the find. If the Applicant determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The plan shall be submitted to the City of Merced for review and approval prior to implementation, and the Applicant shall adhere to the recommendations in the plan.

Level of Significance After Mitigation

Less than significant impact.

Burial Sites

Impact CUL-4:	**Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered human burial sites.**

Impact Analysis

The Cultural Resources Assessment indicated that there were no records of Native American burial sites or evidence that human remains are known to exist within the project area. However, there is always the possibility that subsurface construction activities associated with the proposed project, such as trenching and grading, could potentially damage or destroy previously undiscovered human remains. Accordingly, this is a potentially significant impact. However, if human remains are discovered, implementation of Mitigation Measure CUL-4 would reduce impacts to a level of less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM CUL-4 In the event of the accidental discovery or recognition of any human remains, CEQA Guidelines Section 15064.5, Health and Safety Code Section 7050.5, and Public Resources Code (PRC) Sections 5097.94 and 5097.98 must be followed. If during the course of project development there is accidental discovery or recognition of any human remains, the following steps shall be taken:

1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the County Coroner is contacted and determines if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours, and 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 landowner or the person responsible for the excavation work within 48 hours, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.
2. Where the following conditions occur, the landowner or his or her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendant or on the project site in a location not subject to further subsurface disturbance:
   - The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 48 hours after being notified by the commission.
   - The descendant identified fails to make a recommendation.
   - The landowner or his authorized representative rejects the recommendation of the descendant, and mediation by the NAHC fails to provide measures acceptable to the landowner.

Additionally, California Public Resources Code Section 15064.5 requires the following with regards to Native American Remains:

When an initial study identifies the existence of, or the probable likelihood of, Native American Remains within a project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop a plan for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American Burials with the appropriate Native Americans as identified by the NAHC.

Level of Significance After Mitigation

Less than significant impact.

3.6 - Hazards and Hazardous Materials

3.6.1 - Introduction

This section describes the existing hazards and hazardous materials setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on the City of Merced General Plan.

3.6.2 - Environmental Setting

Hazardous Materials

Hazardous materials, as defined by the California Code of Regulations, are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories, based on their properties:

- Toxic—causes human health effects
- Ignitable—has the ability to burn
- Corrosive—causes severe burns or damage to materials
- Reactive—causes explosions or generates toxic gases

A hazardous waste is any hazardous material that is discarded, abandoned, or slated to be recycled. If improperly handled, hazardous materials and hazardous waste can result in public health hazards if released into the soil or groundwater or through airborne releases in vapors, fumes, or dust. Soil and groundwater having concentrations of hazardous constituents higher than specific regulatory levels must be handled and disposed of as hazardous waste when excavated or pumped from an aquifer. The California Code of Regulations, Title 22, Sections 66261.20-24 contains technical descriptions of toxic characteristics that could cause soil or groundwater to be classified as hazardous waste.

Emergency Plan and Hazardous Waste Management Plan

The Merced City Fire Department and Environmental Health Division work with the County to prevent the uncontrolled release of toxic substances into the environment by conducting inspections of toxic materials facilities, enforcing storage and use requirements, and educating local businesses on proper storage and handling of hazardous materials. The Merced City Fire Department responds to uncontrolled releases within the city limits, identifies the category of chemicals involved, contains the spill if possible, oversees cleanup activities, and makes sure that the site is safe to be occupied again.

The City's Emergency Plan and the County Hazardous Waste Management Plan both deal with detailed emergency response procedures under various conditions for hazardous materials spills. The City also works with the State Department of Health Services to establish cleanup plans and to monitor the cleanup of known hazardous waste sites within the City.

3.6.3 - Regulatory Framework

Federal

Hazardous Materials Laws

The United States Environmental Protection Agency (EPA) is the agency responsible for enforcing federal laws and regulations governing hazardous materials that affect public health or the environment. The major federal laws and regulations enforced by the EPA include the Resource Conservation and Recovery Act, the Toxic Substances Control Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act (SARA).

In 1976, RCRA was enacted to provide a general framework for the EPA to regulate hazardous waste from the time it is generated until its ultimate disposal. In accordance with RCRA, facilities that generate, treat, store, or dispose of hazardous waste are required to ensure that the wastes are properly managed from "cradle to grave."

In 1976, the Toxic Substances Control Act was enacted to provide the EPA authority to regulate the production, importation, use, and disposal of chemicals that pose a risk of adversely impacting public health and the environment, such as polychlorinated biphenyls (PCBs), asbestos-containing materials, and lead-based paint. The Toxic Substances Control Act also gives the EPA authority to regulate the cleanup of sites contaminated with specific chemicals, such as PCBs.

In 1980, CERCLA, also commonly known as the Superfund, was enacted to ensure that a source of funds was available for the EPA to remediate uncontrolled or abandoned hazardous materials release sites that pose a risk of adversely impacting public health and the environment. Prohibitions and requirements regarding closed or abandoned hazardous waste sites and liability standards for responsible parties were also established by CERCLA. In 1986, SARA amended CERCLA to increase the Superfund budget, modify contaminated site cleanup criteria and schedules, and revise settlement procedures.

Other relevant federal laws include the Hazardous and Solid Waste Amendments Act regarding hazardous waste management, the Toxic Substances Control Act, pertaining to the tracking and screening of industrial chemicals, and the Federal Insecticide, Fungicide, and Rodenticide Act, which controls pesticide distribution, sale, and use. Applicable federal regulations and guidelines are contained primarily in Code of Federal Regulations (CFR) Titles 10, 29, 40, and 49.

Hazardous Material Transportation

While the EPA regulates overall use and cleanup of hazardous materials, the U.S. Department of Transportation (DOT) is the federal administering agency responsible for hazardous materials transportation regulations. The DOT Office of Hazardous Materials Safety oversees a national safety program to minimize the risks related to commercial transportation of hazardous materials. The federal hazardous materials transportation law is the basic statute regulating hazardous materials transportation in the U.S. Federal hazardous materials transportation regulations are contained in 49 CFR Parts 171-180. The California Department of Transportation (Caltrans) is the implementing agency for DOT laws and regulations in California.

Worker Health and Safety

Worker health and safety is protected by federal and state laws and regulations. The Occupational Health and Safety Administration (OSHA) is the federal agency responsible for enforcement and implementation of federal laws and regulations pertaining to worker health and safety. Under OSHA jurisdiction, the Hazardous Waste Operations and Emergency Response regulations require training and medical supervision for workers at hazardous waste sites. Additional regulations have been developed for construction workers regarding exposure to lead and asbestos during construction activities. State regulations pertaining to worker health and safety are discussed below.

State

Hazardous Materials

In California, the EPA has granted most enforcement authority over federal hazardous materials regulations to the California Environmental Protection Agency (Cal/EPA). The mission of Cal/EPA is to restore, protect, and enhance the environment to ensure public health, environmental quality, and economic vitality. Under the authority of Cal/EPA, the Department of Toxic Substances Control (DTSC) and the Central Valley Regional Water Quality Control Board (RWQCB) are responsible for overseeing the cleanup of contaminated soil and groundwater sites in the plan area. RWQCB regulations applicable to hazardous materials are contained in Title 27 of the California Code of Regulations (CCR). Additional state regulations applicable to hazardous materials are contained in CCR Title 22. CCR Title 26 is a compilation of those sections or titles of the CCR that are applicable to hazardous materials.

Worker Health and Safety

The California Department of Industrial Relations, Division of Occupational Safety and Health, enforces State worker health and safety regulations related to construction activities. Regulations include exposure limits, protective clothing, and training requirements to prevent exposure to hazardous materials. Division of Occupational Safety and Health also enforces occupational health and safety regulations specific to lead and asbestos investigations and abatement, which are equal to or exceed their federal counterparts.

California Department of Transportation and California Highway Patrol

The California Vehicle Code Section 31303 requires that hazardous materials be transported via routes with the least overall travel time, and prohibits the transportation of hazardous materials through residential neighborhoods. In California, the California Highway Patrol is authorized to designate and enforce route restrictions for the transportation of hazardous materials. To operate in California, all hazardous waste transporters must be registered with the DTSC. Unless specifically exempted, hazardous waste transporters must comply with the California Highway Patrol Regulations, the California State Fire Marshal Regulations, and the United States Department of Transportation Regulations. In addition, hazardous waste transporters must comply with Division 20, Chapter 6.5, Article 6 and 13 of the California Health and Safety Code, and the Title 22, Division 4.5, Chapter 13 of the California Code of Regulations, both of which are administered by DTSC.

Underground Storage Tank (UST) Permitting Requirements

California Code of Regulations Title 23, Division 3, Chapter 16, California Health and Safety Code Section (25280–25299.8) require a permit to operate a UST system. Permits are issued through the local County Environmental Health Department (or equivalent agency). As part of the permitting application, the UST operator must demonstrate financial responsibility in the event of a release.

Local

General Plan

The City of Merced General Plan sets forth the following goals and policies related to hazards and hazardous materials that are relevant to the proposed project:

- **Policy S-1.1:** Develop and Maintain Emergency Preparedness Procedures for the City.
- **Implementing Action 1.1.g**—Adopt and update the Merced Hazard Mitigation Plan as needed, and consult it when addressing known hazards to ensure the general health and safety of people within the City of Merced.
- **Policy S-4.1:** Promote the Concept of Fire Protection Master Planning with Fire Safety Goals, Missions, and Supporting Objectives for the Community.
- **Implementing Action 4.2.d**—Continue close collaboration between Inspection Services, Fire Prevention, and Fire Suppression support personnel to ensure public safety and improve construction safety through the building permit and life safety inspections process.
- **Implementing Action 4.2.e**—Continue to enforce the present nuisance abatement program regarding a height limit on weeds during the dry season (mid-April through mid-November) in both vacant and development lots, abandoned vehicles, and vacant buildings.
- **Policy S-7.1:** Prevent Injuries and Environmental Contamination Due to the Uncontrolled Release of Hazardous Materials.
- **Implementing Action 7.1.a**—Support Merced County in carrying out and enforcing the Merced County Hazardous Waste Management Plan.
- **Implementing Action 7.1.b**—Continue to update and enforce local ordinances regulating the permitted use and storage of hazardous gases, liquids, and solids.
- **Implementing Action 7.1.c**—Continue to make sure underground storage tanks containing hazardous materials are properly installed, used, and removed.
- **Implementing Action 7.1.d**—Provide continuing training for hazardous materials enforcement and response personnel.
- **Implementing Action 7.1.e**—To the extent feasible, encourage new residential developments and other projects to locate an adequate distance from potential existing sources of toxic emissions, such as freeways, heavy industrial sites, and other hazardous materials locations.

3.6.4 - Methodology

FCS evaluated potential impacts from hazards and hazardous materials through review of the City of Merced General Plan.

3.6.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, hazards and hazardous materials impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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 likely release of hazardous materials into the environment? (Refer to Section, Effects Found not to be Significant.)

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? (Refer to Section, Effects Found not to be Significant.)

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? (Refer to Section, Effects Found not to be Significant.)

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working the project area? (Refer to Section, Effects Found not to be Significant.)

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? (Refer to Section, Effects Found not to be Significant.)

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

3.6.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Routine Transport, Use, or Disposal of Hazardous Materials

Impact HAZ-1:	**The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.**

Impact Analysis

The Merced City Fire Department and Environmental Health Division work with the County to prevent the uncontrolled release of toxic substances into the environment by conducting inspections

of toxic materials facilities, enforcing storage and use requirements, and educating local businesses on proper storage and handling of hazardous materials. The Merced City Fire Department responds to uncontrolled releases within the city limits, identifies the category of chemicals involved, contains the spill if possible, oversees cleanup activities, and makes sure that the site is safe to be occupied again.

Both the City's Emergency Plan and the County Hazardous Waste Management Plan deal with detailed emergency response procedures under various conditions for hazardous materials spills. The City also works with the State Department of Health Services to establish cleanup plans and to monitor the cleanup of known hazardous waste sites within the City.

Project construction and operational activities may involve the use and transport of hazardous materials. These materials may include fuels, oils, mechanical fluids, architectural coatings and other chemicals used during construction. The use of such materials would be considered minimal and would not require these materials to be stored in large quantities.

The proposed project contemplates a gas station in the southern portion of the project site at the intersection of Campus Parkway/Coffee Street. The gas station would store gasoline and diesel products in USTs. Fuel stations typically have up to four 1,000-gallon to 10,000-gallon USTs on-site. Pursuant to state regulations, all USTs would undergo pre-installation testing to verify structural integrity and employ safety features such as primary and secondary containment systems, spill containment and overfill prevention systems, and leak detection systems. All USTs would be permitted by the County of Merced. All truck drivers transporting fuel to the site would be required to possess a valid commercial driver license with requisite hazardous materials endorsements. Additionally, truck drivers would be subject to federal and state requirements that govern the safe operation of such vehicles (such as hours of service limits). Moreover, the truck units would be required to undergo regular inspection, with documentation kept on file for verification by law enforcement or regulatory agencies. Collectively, these safety requirements provide assurances that the operational activities associated with the fuel station would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Other residential and commercial end users of the project would be expected to handle small quantities of commonly used substances such as cleaning solvents, herbicides, fertilizers, diesel, gasoline, grease/degreasers, mechanical fluids, and oil as part of daily operations. The routine use of these substances would not be considered a potential risk to human health or the environment. As such, the project would not create a significant hazard to the public through the routine use, transport, or disposal of hazardous materials.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Emergency Response and Evacuation

Impact HAZ-2:	**The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.**

Impact Analysis

The proposed project contemplates a network of new and improved roadways that would be designed and constructed in accordance with the City of Merced General Plan street section standards. This would improve emergency evacuation and response within the plan area.

Individual development projects within the Master Plan area would be required to comply with the California Fire Code's access requirements, including but not limited to the provision of at least two access points suitable for use by fire apparatus. Additionally, the City of Merced actively maintains an Emergency Operations Plan, and all development projects are reviewed by the Fire Department to ensure that emergency response is not constrained.

Temporary construction activity would be expected to create temporary delays in traffic. Such delays would be typical for a construction project of this nature and would not be expected to interfere with an adopted emergency response plan or emergency evacuation plan; furthermore, construction contract provisions would require the preparation of a traffic management plan to address and minimize potential delays to emergency response plans. As such, impacts would be less than significant. Potential traffic impacts are discussed further in the Traffic/Transportation section.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Wildland Fires

Impact HAZ-3:	**The project would not expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.**

Impact Analysis

According to the California Department of Forestry and Fire Protection, the project site is not located in any fire hazard zone. The areas surrounding the project site are mostly undeveloped/vacant. There is a low potential for wildland fires within these parameters. Additionally, the California

Building Code and the California Fire Codes work together to regulate building construction and related items such as the care of vacant lots and the storage of flammable liquids.

To provide effective fire prevention activities for low hazard occupancies, the Fire Department conducts seasonal hazard removal programs (primarily weed abatement). The City of Merced employs a weed abatement program, which requires property owners to eliminate flammable vegetation and rubbish from their properties. Each property within the City is surveyed each spring and notices are sent to the property owners whose properties have been identified to pose a fire risk. Since inception of this program in 1992, grass or brush related fires within the City have been greatly reduced. The City also picks up abandoned vehicles, and a "Spring Clean-up" conducted annually allows people to have bulky refuse picked up at transfer stations without charge. Further, staging areas, building areas, and/or areas slated for development using spark-producing equipment are cleared of dried vegetation or other materials that could serve as fuel for combustion; impacts are considered less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

3.7 - Hydrology and Water Quality

3.7.1 - Introduction

This section describes the existing hydrology and water quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information provided by the Western Regional Climate Center, the Central Valley Regional Water Quality Control Board (Central Valley RWQCB), the California Department of Water Resources Bulletin 118, the City of Merced Storm Drain Master Plan, and the Merced Vision 2030 General Plan. A Water Supply Assessment for Merced Gateway was prepared by Balance Hydrologics (2016) to determine the available water supply for the project and is contained in Appendix H of this EIR.

3.7.2 - Environmental Setting

Climate and Meteorology

Merced is characterized by a Mediterranean climate, which is noted for warm summers, mild winters, and moderate precipitation. Temperatures range from an average low of 36.0 degrees Fahrenheit (°F) in January to an average high of 97.1°F in July. Precipitation averages 12.27 inches per year. Meteorological data for the Merced area, as measured at the Merced Municipal Airport, are summarized in Table 3.7-1.

Table 3.7-1: Merced Meteorological Summary

Month	Temperature (°F)		Precipitation (inches)
	Average Low	Average High	
January	36.0	54.9	2.46
February	38.7	61.6	2.17
March	41.2	67.2	1.96
April	44.9	74.3	1.09
May	50.6	82.6	0.44
June	56.4	90.8	0.10
July	60.9	97.1	0.01
August	58.9	95.3	0.02
September	54.8	90.0	0.15
October	47.2	79.8	0.60
November	39.6	66.2	1.37
December	35.6	55.7	1.89
Annual Average	**47.1**	**76.3**	**12.27**

Note:
Period of measurement from June 1, 1899 to January 20, 2015.
Source: Western Regional Climate Center, 2016.

Surface Water Bodies

The project site is located within the Doane Lateral Canal watershed, which is tributary to Miles Creek and, ultimately, the San Joaquin River. All three waterways are discussed separately.

Doane Lateral Canal

Doane Lateral Canal is owned and maintained by the Merced Irrigation District. The canal is both an irrigation water conveyance and a stormwater drainage facility, and it consists of both open ditch and covered segments. The Doane Lateral Canal begins near Bear Creek and discharges into Miles Creek near Vassar Avenue/State Route 99 (SR-99). The portion of the Doane Lateral Canal watershed that overlaps with the Merced city limits is approximately 2.7 square miles. Runoff enters the canal via sheet flow; there are no municipal storm drainage facilities within this area (inlets, underground piping, etc.).

Miles Creek

Miles Creek begins in the Sierra Foothills east of Merced and meanders in a northeast-southwest direction to its confluence with the San Joaquin River near the Merced National Wildlife Refuge. Miles Creek is located in both natural and man-made channels.

San Joaquin River

The San Joaquin River is the second-longest river in California at 366 miles and drains 31,800 square miles of the upper San Joaquin Valley and western Sierra Nevada Mountains, including the entire City of Merced. The river flows from south-to-north and empties into Suisun Bay near Antioch. The San Joaquin River's watershed extends from Sacramento County and Amador County in the north to Fresno County in the south, and overlaps with portions of Yosemite National Park, Kings Canyon National Park, El Dorado National Forest, Stanislaus National Forest, and Sierra National Forest. The river has several major tributaries, including the Fresno, Bear Creek, Merced, Tuolumne, Stanislaus, Calaveras, Mokelumne, and Cosumnes Rivers.

Impaired Water Bodies

The United States Environmental Protection Agency (EPA) compiles a list of impaired water bodies pursuant to Section 303(d) of the Clean Water Act. For waters identified as impaired, the RWQCBs are to develop a Total Maximum Daily Load (TMDL) to account for all sources of pollutants from both point and nonpoint sources that are attributed to its listing. Table 3.7-2 summarizes the impaired water body status of Miles Creek and the San Joaquin River segment closest to Merced.

Table 3.7-2: Impaired Water Body Summary

Water Body	Segment	Stressor	Source	TMDL Completion Date
Miles Creek	Planada to Hartley Slough	Diuron	Agriculture	2021
San Joaquin River	Mendota Pool to Bear Creek	Boron	Agriculture	2019
		Chlorpyrifos	Agriculture	Approved (2007)

Table 3.7-2 (cont.): Impaired Water Body Summary

Water Body	Segment	Stressor	Source	TMDL Completion Date
		DDT	Agriculture	2011
		Diazinon	Agriculture	2011
		Electrical Conductivity	Agriculture	Approved (2007)
		Group A Pesticides	Agriculture	2011
		Unknown Toxicity	Agriculture	2019

Notes:
TMDL=Total Maximum Daily Load; DDT=Dichlorodiphenyltrichloro ethane
Source: State Water Resources Control Board, 2016.

Storm Drainage

Existing Stormwater Management

As previously noted, the project site is located with the Doane Lateral Canal watershed. The canal parallels the west side of Campus Parkway before entering a culvert under the roadway and continuing south in an open channel to Miles Creek. There are no municpal storm drainage facilities within the project site. Runoff from the project site either ponds on-site or sheet flows into the canal.

Planned Facilities

The City of Merced Storm Drainage Master Plan contemplates a future north-south storm drainage line that would run along the eastern boundary of the project site. The storm drainage line would begin as a 36-inch-diameter pipeline on the north side of Campus Parkway, upsize to a 54-inch-diameter pipe south of the parkway, and upsize again to a 60-inch-diameter pipe at Mission Avenue before discharging into an existing stormwater basin at the Doane Lateral Canal crossing of Mission Avenue. Runoff from the basin that does not evaportate or percolate into the soil would eventually enter Doane Laternal Canal.

Groundwater

The City of Merced overlies the San Joaquin Valley Groundwater Basin, Merced Subbasin, which encompasses a 767-square-mile area that overlaps with Merced County. The subbasin characteristics, as described in the California Department of Water Resources Bulletin 118, are summarized as follows.

Basin Boundaries and Hydrology

The Merced Subbasin includes lands south of the Merced River between the San Joaquin River on the west, and the crystalline basement rock of the Sierra Nevada foothills on the east. The subbasin boundary on the south stretches westerly along the Madera-Merced County line (Chowchilla River)

and then between the boundary of the Le Grand-Athlone Water District and the Chowchilla Water District. The boundary continues west along the northern boundaries of Chowchilla Water District and El Nido Irrigation District. The southern boundary then follows the western boundary of El Nido Irrigation District south to the northern boundary of the Sierra Water District, which is followed westerly to the San Joaquin River. Average annual precipitation is 11 to 13 inches, increasing eastward.

Groundwater Level Trends

Changes in groundwater levels are based on annual water level measurements by Department of Water Resources (DWR) and co-operators. On average, the subbasin water level has declined nearly 30 feet from 1970 through 2000. The period from 1970 through 1978 showed steep declines totaling about 15 feet. The 10-year period from 1978 to 1988 saw stabilization and a rebound of about 10 feet. The years between 1988 through 1995 again showed steep declines, bottoming out in 1996 with water levels rising from 1996 to 2000. Appendix H presents the yearly water levels graphically. Water level declines have been more severe in the eastern portion of the subbasin.

Groundwater Storage

Estimates of the total storage capacity of the subbasin and the amount of water in storage as of 1995 were calculated using an estimated specific yield of 9.0 percent and water levels collected by DWR and cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 21,100,000 acre-feet to a depth of 300 feet, and 47,600,000 acre-feet to the base of fresh groundwater. These same calculations give an estimate of 15,700,000 acre-feet of groundwater to a depth of 300 feet stored in this subbasin as of 1995. According to published literature, the amount of stored groundwater in this subbasin is 37 million acre-feet to a depth of 1,000 feet.

Groundwater Budget

Natural recharge into the subbasin is estimated to be 47,000 acre-feet. Values for artificial recharge and subsurface inflow are not determined. There are approximately 243,000 acre-feet of applied water recharge into the subbasin. Annual urban and agricultural extractions are 54,000 acre-feet and 492,000 acre-feet, respectively. Other extractions equal approximately 9,000 acre-feet. Subsurface inflow values are not determined.

Groundwater Quality

The groundwater in this subbasin is characterized by calcium-magnesium bicarbonate at the basin interior, sodium bicarbonate to the west, and calcium-sodium bicarbonate to the south. Small areas of sodium chloride and calcium-sodium chloride waters exist at the southwest corner of the basin. Total dissolved solids (TDS) values range from 100 to 3,600 milligrams per liter (mg/l), with a typical range of 200 to 400 mg/l. The Department of Health Services, which monitors Title 22 water quality standards, reports TDS values in 46 wells ranging from 150 to 424 mg/l, with an average value of 231 mg/l. For 10 wells, electrolytic conductivity values range from 260 to 410 microsiemens per centimeter (µmhos/cm), with an average value of 291 µmhos/cm.

Flood Hazard Areas

Merced Vision 2030 General Plan Figure 11.5 indicates that the project site is within a 100-year flood hazard area.

Dam Failure

Merced Vision 2030 General Plan Figure 11.3 indicates that the project site is not within the dam failure inundation area of either Bear Reservoir or Yosemite Lake.

3.7.3 - Regulatory Framework

Federal

Clean Water Act

Section 303 of the Clean Water Act (CWA) requires states to adopt water quality standards for all surface waters of the United States. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards (see description of the Porter-Cologne Water Quality Control Act, below). Standards are based on the designated beneficial use(s) of the water body. Where multiple uses exist, water quality standards must protect the most sensitive use.

Section 401 of the CWA requires any person applying for a federal permit or license that may result in the discharge of pollutants into waters of the United States (including wetlands) to obtain a state certification. In California, certifications are administered by the State Water Resources Control Board (SWRCB) through the nine RWQCBs (see a description of state regulations below). In order to acquire certification, it must be demonstrated that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit by a federal agency may be granted until 401 certification has been granted. Section 401 water quality certifications are typically required prior to obtaining a Section 404 permit from the United States Army Corps of Engineers (USACE).

Section 402 of the CWA mandates that certain types of construction activity comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater program. In California, any construction activity (with the exception of certain industrial activities, none of which are proposed for this project) that disturbs at least 1 acre is required to obtain coverage under the Construction General Permit issued by the SWRCB and implemented and enforced by RWQCBs.

National Flood Insurance Program

The Federal Emergency Management Agency (FEMA) oversees floodplains and administers the National Flood Insurance Program adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities who participate in the program. Areas of special flood hazard (those subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps. The National Flood Insurance Program mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results

in more than a 1-foot increase in flood elevation. In addition, development is not allowed in delineated floodways within the regulatory floodplain.

State

Water Quality Statutes and Regulations

Section 303(d) of the CWA requires that SWRCB identify surface water bodies within California that do not meet established water quality standards. Once identified, the affected water body is included in the SWRCB's "303(d) Listing of Impaired Water Bodies" and a comprehensive program must then be developed to limit the amount of pollutant discharges into that water body. This program includes the establishment of "total maximum daily loads" for pollutant discharges into the designated water body. The most recent 303(d) listing for California was approved by the United States Environmental Protection Agency (EPA) in 2010.

The Porter-Cologne Water Quality Control Act of 1969 authorized the SWRCB to provide comprehensive protection for California's waters through water allocation and water quality protection. The SWRCB implements the requirements of Clean Water Act Section 303, indicating that water quality standards have to be set for certain waters by adopting water quality control plans under the Porter-Cologne Act. The Porter-Cologne Act established the responsibilities and authorities of the nine RWQCBs, which include preparing water quality plans for areas in the region, identifying water quality objectives, and issuing NPDES permits and Waste Discharge Requirements. Water quality objectives are defined as limits or levels of water quality constituents and characteristics established for reasonable protection of beneficial uses or prevention of nuisance. The Porter-Cologne Act was later amended to provide the authority delegated from the EPA to issue NPDES permits.

Projects disturbing more than 1 acre of land during construction are required to comply with the Construction General Permit (Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, effective February 14, 2011; NPDES No. CAS000002). Construction General Permit activities are regulated at a local level by the RWQCB. To obtain coverage under the Construction General Permit, a project applicant must provide a Notice of Intent, a Stormwater Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit. Activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the project risk level (Level 1, Level 2, or Level 3). The project risk level is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on project location and timing (such as wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. The determination of the project risk level would be made by project applicant when the Notice of Intent is filed (and when more details of the timing of the construction activity are known).

The performance standard in the Construction General Permit is that dischargers minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and best management practices (BMPs). A SWPPP must be prepared by a qualified SWPPP developer that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is (1) to help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges, and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. Operation of BMPs must be overseen by a qualified SWPPP practitioner who meets the requirements outlined in the permit.

Central Valley Regional Water Quality Control Board

There are nine Regional Water Quality Control Boards (RWQCBs) throughout the State. The Central Valley RWQCB has jurisdiction over the City of Merced. Individual RWQCBs function as the lead agencies responsible for identifying, monitoring, and cleaning up leaking underground storage tanks (USTs). Storage of hazardous materials in USTs is regulated by the SWRCB, which oversees the nine RWQCBs.

Underground Storage Tank Permitting Requirements

California Code of Regulations Title 23, Division 3, Chapter 16, California Health and Safety Code Section (25280–25299.8) require a permit to operate a UST system. Permits are issued through the local County Environmental Health Department (or equivalent agency). As part of the permitting application, the UST operator must demonstrate financial responsibility in the event of a release.

Local

City of Merced

General Plan

The Merced Vision 2030 General Plan establishes the following goals and policies relevant to hydrology and water quality:

- **Goal:** An Adequate Storm Drainage Collection and Disposal System in Merced
- **Policy-5.1:** Provide effective storm drainage facilities for future development.
- **Policy-5.2:** Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.
- **Goal:** A City Free From Other Than Street Flooding
- **Policy S-3.1:** Implement Protective Measures for Areas in the City and the SUDP/SOI Within the 100-Year and 200-Year Floodplains.
- **Policy S-3.2:** Maintain Essential City Services in the Event of Flooding or Dam Failure.

Code of Ordinances

Merced Code of Ordinances Chapter 17.48 sets forth the Flood Damage Prevention Ordinance. The Ordinance applies to new construction that occurs within Federal Emergency Management Agency (FEMA) special flood hazard areas, and requires that a development permit application be filed with the City that demonstrates that applicable requirements for anchoring, construction materials and methods, elevation, and floodproofing have been incorporated into building plans.

3.7.4 - Methodology

The analysis in this section is based on information from sources including the Western Regional Climate Center, the Central Valley RWQCB's 303(d) List of Impaired Water Bodies, the City of Merced Storm Drain Master Plan, and the California Department of Water Resources Bulletin 118, the Water Supply Assessment for Merced Gateway prepared by Balance Hydrologics (2016) (Appendix H) and review of project plans.

3.7.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, hydrology and water quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

a) Violate any water quality standards or waste discharge requirements?

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?

c) Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

e) 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?

f) Otherwise substantially degrade water quality?

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

j) Inundation by seiche, tsunami, or mudflow? (Refer to Section 7, Effects Found not to be Significant.)

3.7.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

Water Quality

Impact HYD-1:	**Construction and operational activities associated with the proposed project have the potential to degrade water quality in downstream water bodies.**

Impact Analysis

This impact addresses whether the proposed project would violate any water quality standards or waste discharge requirements (Checklist question a); substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site (Checklist question c); or otherwise substantially degrade water quality (Checklist question f) during construction activities.

Short-Term Water Quality

Project implementation would require grading, building construction, and paving activities on the 77-acre project site. It is assumed that the entire site would be disturbed simultaneously during grading and construction activities. During these activities, there would be the potential for surface water to carry sediment from on-site erosion and other pollutants into the stormwater system and local waterways.

Construction of the proposed project would also require the use of gasoline- and diesel-powered heavy equipment such as bulldozers, backhoes, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, lubricating oil, hydraulic oil, lubricating grease, automatic transmission fluid, paints, solvents, glues, and other substances would be utilized during construction. An accidental release of any of these substances could degrade the water quality of the surface water runoff and add additional sources of pollution into the drainage system.

NPDES stormwater permitting is required by the State Water Board's Construction General Stormwater Permit (General Permit). The General Permit regulates stormwater discharges from construction sites. Under the General Permit, the preparation and implementation of SWPPPs are required for construction activities more than 1 acre in area. The SWPPP must identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharges as well as identify and implement BMPs that ensure the reduction of these pollutants during stormwater discharges.

Mitigation Measure HYD-1a is proposed, which would require the project applicant to prepare and implement a SWPPP. The implementation of this mitigation measure would ensure that potential, short-term, construction water quality impacts are reduced to a level of less than significant.

Long-Term Water Quality

The project site contains undeveloped land and does not contain any storm drainage facilities. Runoff currently either ponds on-site or sheet flows to the Doane Lateral Canal, and is eventually discharged to Miles Creek and ultimately the San Joaquin River.

The proposed project would result in the development of new commercial buildings and infrastructure on the 77-acre project site. The proposed project would increase the amount of impervious surface coverage on the project site and would create the potential for discharge of urban pollutants into downstream waterways. Such pollutants would include sediment and turbidity, nutrients, organic compounds, oxygen demanding substances, trash and debris, bacteria and viruses, oil and grease, pesticides, and metals.

As discussed previously, the City will require the project applicant to prepare a Storm Water Mitigation Plan (SWMP) for review and approval that identifies BMPs necessary to control stormwater pollution from operational activities and facilities, and provide for appropriate maintenance over time. The SWMP would include design concepts that are intended to accomplish a "first flush" objective that would remove contaminants from the first 2 inches of stormwater before it enters area waterways. To ensure that stormwater quality measures are implemented, Mitigation Measure HYD-1b is proposed, which would require the project applicant to prepare and submit an SWMP to the City of Merced for review and approval. The implementation of this mitigation measure would ensure that potential, long-term, operational water quality impacts are reduced to a level of less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM HYD-1a Prior to the issuance of grading permits, the project applicant shall file a Notice of Intent with and obtain a facility identification number from the State Water Resources Control Board. The project applicant shall also submit a Stormwater Pollution Prevention Plan (SWPPP) to the City of Merced that identifies specific actions and Best Management Practices (BMPs) to prevent stormwater pollution during construction activities. The SWPPP shall identify a practical sequence for BMP implementation, site restoration, contingency measures, responsible parties, and agency contacts. The SWPPP shall include but not be limited to the following elements:

- Comply with the requirements of the State of California's most current Construction Stormwater Permit.
- Temporary erosion control measures shall be implemented on all disturbed areas.
- Disturbed surfaces shall be treated with erosion control measures during the October 15 to April 15 rainy season.
- Sediment shall be retained on-site by a system of sediment basins, traps, or other BMPs.

- The construction contractor shall prepare Standard Operating Procedures for the handling of hazardous materials on the construction site to eliminate discharge of materials to storm drains.
- BMP performance and effectiveness shall be determined either by visual means where applicable (e.g., observation of above-normal sediment release), or by actual water sampling in cases where verification of contaminant reduction or elimination (such as inadvertent petroleum release) is required by the Central Valley Regional Water Quality Control Board to determine adequacy of the measure.
- In the event of significant construction delays or delays in final landscape installation, native grasses or other appropriate vegetative cover shall be established on the construction site as soon as possible after disturbance, as an interim erosion control measure throughout the wet season.

MM HYD-1b Prior to the issuance of building permits, the project applicant shall submit a final Storm Water Mitigation Plan (SWMP) to the City of Merced for review and approval. The plan shall be developed using the California Stormwater Quality Association's "New Development and Redevelopment Handbook." The SWMP shall identify pollution prevention measures and BMPs necessary to control stormwater pollution from operational activities and facilities, and provide for appropriate maintenance over time. The SWMP shall include design concepts that are intended to accomplish a "first flush" objective that would remove contaminants from the first 2 inches of stormwater before it enters area waterways. The project applicant shall also prepare and submit an Operations and Maintenance Agreement to the City identifying procedures to ensure that stormwater quality control measures work properly during operations.

Level of Significance After Mitigation

Less than significant impact.

Groundwater

Impact HYD-2: The proposed project would not contribute to groundwater overdraft or impair groundwater recharge.

Impact Analysis

This impact assesses whether the project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge, and whether groundwater would be impaired by USTs from the proposed fuel station use.

Groundwater Overdraft

The City of Merced relies almost exclusively on local groundwater from the Merced Subbasin to supply its customers. The City maintains 19 wells throughout its service area with rated capacities between 1,200 and 4,000 gallons per minute.

The Merced Subbasin is listed as a "critically overdrafted" groundwater basin by the State. The subbasin has experienced a more than 30-foot decrease in groundwater levels since 1970. Although groundwater levels have decreased, the City of Merced's ability to pump from the subbasin has not been adversely affected. Moreover, the City and the Merced Irrigation District have implemented groundwater management efforts since 1997 to slow the decline of overdraft, including direct recharge and in-lieu recharge. In 2008, both agencies adopted a Groundwater Management Plan for the subbasin that sets forth strategies to optimize use of the groundwater resource to eliminate the overdraft.

The Water Supply Assessment prepared by Balance Hydrologics estimated project water demand to be 150 acre-feet/year at buildout. For comparison purposes, "worst case" total demand for the City of Merced municipal water system service area is estimated to range from 39,977 acre-feet/year in 2020 to 54,649 acre-feet/year in 2030. Thus, the proposed project's demand would represent 0.3 to 0.4 percent of total citywide demand. The Water Supply Assessment indicated that adequate water supplies are expected to be available under all water year scenarios, taking into account the water demands of the proposed project.

Moreover, the Water Supply Assessment noted that the City of Merced experienced a net decrease in water demand in 2014 and 2015 in response to the mandatory water use reduction measures issued by the State. This serves to demonstrate that the City has the ability to manage its municipal water supply such that it can provide adequate water supplies in periods of extended drought.

Finally, the proposed project would be required to use metered connections, and it would be required to comply with the City water efficiency requirements for landscaping and any temporary or permanent mandatory water conservation measures that are in effect. All of these requirements would serve to reduce potable water demand and, by extension, pumping from the Merced Subbasin.

In summary, although the Merced Subbasin is in a state of overdraft, the overdraft in itself is not a limitation on the City's ability to draw water from the aquifer. Additionally, the project would implement measures to reduce demand and, as discussed later, facilitate groundwater recharge. Lastly, the City and Merced Irrigation District are proactively managing the subbasin to reverse the overdraft trend and the project is consistent with those efforts. Therefore, impacts on groundwater overdraft would be less than significant.

Groundwater Recharge

As discussed in Impact HYD-3, project runoff would be discharged to a County-owned stormwater basin near the intersection of Mission Avenue/Coffee Street. Most of the runoff that enters this basin would percolate into the soil, which would serve to directly facilitate local groundwater recharge within the Merced Subbasin.

Additionally, project runoff that leaves the basin and is conveyed elsewhere would end up either in another stormwater basin or in a downstream waterway (e.g., canal or creek). Groundwater recharge could occur within any of these facilities. Therefore, the proposed project would not interfere with groundwater recharge efforts. Impacts would be less than significant.

Groundwater Impairment

The proposed project contemplates a gas station in the southern portion of the project site at the intersection of Campus Parkway/Coffee Street. The gas station would store gasoline and diesel products in USTs. Fuel stations typically have up to four 1,000-gallon to 10,000-gallon USTs on-site. Pursuant to state regulations, all USTs would undergo pre-installation testing to verify structural integrity and employ safety features such as primary and secondary containment systems, spill containment and overfill prevention systems, and leak detection systems. All USTs would permitted by the County of Merced.

Collectively, these safety requirements provide assurances that the operational activities associated with the fuel station would not impair groundwater resources through leaks. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Drainage

Impact HYD-3:	**The proposed project would not contribute runoff to downstream storm drainage facilities that would result in the potential for flooding.**

Impact Analysis

This impact assesses the potential for the proposed project to create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems (Checklist questions d and e).

The project site is located within the Doane Lateral Canal watershed. The canal parallels the west side of Campus Parkway before entering a culvert under the roadway and continuing south in an open channel to Miles Creek. There are currently no municpal storm drainage facilities within the project site. Runoff from the project site either ponds on-site or sheet flows to the canal.

The City of Merced Storm Drainage Master Plan contemplates a future storm drainage line that would run along the eastern boundary of the project site in a north-south direction. The storm drainage line would begin as a 36-inch-diameter pipeline on the north side of Campus Parkway, upsize to a 54-inch-diameter pipe south of the parkway, and finally upsize to a 60-inch-diameter pipe at Mission Avenue before discharging to an existing stormwater basin at the Doane Lateral Canal crossing of Mission Avenue.

In lieu of constructing the storm drainage facilities contemplated by the Storm Drainage Master Plan, the project applicant is proposing to develop a storm drainage system that would convey runoff to an

off-site stormwater basin located at the intersection of Mission Avenue/Coffee Street. This basin is owned and maintained by the County of Merced and was developed in conjunction with the SR-99/Campus Parkway interchange.

The preliminary stormwater runoff analysis shows 615,855 cubic feet of runoff volume that will be conveyed through drainage bioswales into inlets that will be equipped with catch basin filters and piped to the existing basin. Pursuant to the County's drainage design standards, the applicant would be required to excavate the basin to increase capacity to meet the design standard of accommodating a 100-year storm plus 20 percent over capacity. This would be equivalent to 13.6 acre-feet.

Collectively, these measures would serve to slow, reduce, and meter the volume of runoff leaving the project site and ensure that downstream storm drainage facilities are not inundated with project-related stormwater. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

100-Year Flood Hazard Areas

Impact HYD-4: The proposed project may locate structures within a 100-year flood hazard area.

Impact Analysis

This impact addresses the potential for the project to place structures or housing within a 100-year flood hazard area (Checklist questions g and h).

As indicated in Merced Vision 2030 General Plan Figure 11.5, the entire project site is located in a 100-year flood hazard area. In accordance with federal law, all project buildings in a flood zone would need to have the finished floor a minimum of 1-foot above the 100-year flood elevation. This requirement is reflected in Mitigation Measure HYD-4 and would reduce impacts to a level of less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM HYD-4 Prior to issuance of grading permits for any building located within a 100-year hazard flood zone, the applicant shall prepare and submit building plans to the City of Merced that demonstrate compliance with federal law and Merced Code of Ordinances Chapter 17.48. The standards include but are not limited to requirements for

anchoring, construction materials and methods, elevation, and floodproofing. In addition, the applicant shall provide certification by a registered professional engineer or architect that the activity would not result in an increase in flood levels during the occurrence of the base flood discharge.

Level of Significance After Mitigation

Less than significant impact.

Levee or Dam Failure

Impact HYD-5: The proposed project would not expose people or structures to flooding as a result of levee or dam failure.

Impact Analysis

This impact addresses the potential for the project to expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam (Checklist question i).

Merced Vision 2030 General Plan Figure 11.3 indicates that the project site is not within the dam failure inundation area of either Bear Reservoir or Yosemite Lake. This condition precludes the possibility of the proposed project exposing people or structures to risks associated with flooding from dam failure. Additionally, the project site is not protected by any levees, a condition that precludes the possibility of the proposed project exposing people or structures to risks associated with flooding from levee failure. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

THIS PAGE INTENTIONALLY LEFT BLANK

3.8 - Land Use

3.8.1 - Introduction

This section describes the existing land use and planning setting and potential effects from implementation of the Merced Gateway Master Plan on the project site and its surroundings. Descriptions and analysis in this section are substantially based on the City of Merced General Plan, the Merced Municipal Code, and the proposed Merced Gateway Master Plan (Master Plan).

3.8.2 - Environmental Setting

Existing Land Use

Project Site

The 77.5-acre Master Plan site is located in the southeast corner of the City of Merced. An on- and off-ramp to State Route 99 (SR-99) is located approximately 500 feet west of the site, which allows for quick regional access. The newly constructed Campus Parkway bisects the site and includes median and separated multi-use trail improvements. The Master Plan area is bordered by South Coffee Street to the west, East Mission Avenue to the south, East Gerard Avenue to the north, and vacant lands designated as future business park use to the east.

The Master Plan area is characterized by undeveloped land that is regularly disked. Weedy vegetation is present throughout the project site, which is surrounded by a barbed wire fence and includes wooden signs advertising the project as available for commercial development. The elevation of the project site is approximately 300 feet above mean sea level.

Surrounding Area

South Coffee Street forms the western boundary of the project site. West of South Coffee Street are Pioneer Elementary School (north of East Parsons Avenue), two undeveloped parcels designated for "Thoroughfare Commercial" by the General Plan (north and south of Campus Parkway), and the SR-99/Campus Parkway interchange. East Gerard Avenue forms the northern boundary of the project site. North of East Gerard Avenue are single-family residential uses designated "Low Density Residential" by the General Plan. Undeveloped land that was previously used for cultivated agriculture is located east of the project site. This land is designated for "Business Park" use by the General Plan. East Mission Avenue forms the southern boundary of the project site. South of East Mission Avenue is undeveloped land designated "Regional Commercial" by the General Plan.

Land Use Designations

Project Site

The Master Plan area includes two General Plan land use designations. These include 8.4 acres of High-Medium Density Residential (HMD) and 68.6 acres of Regional/Community Commercial (RC), as shown in Exhibit 2-4.

The HMD area is located in the northwest corner of the site. The vision for this area is to include up to 178 multi-family dwelling units in an apartment, townhouse, or condominium type configuration.

The RC area is divided by Campus Parkway, a four-lane expressway with a central median and a multiuse path on the north side. South of Campus Parkway, the project includes visitor-serving uses such as quick-serve/drive-thru dining, service stations, hotel, and big-box retail. North of Campus Parkway, community-serving uses such as a theater/entertainment use, restaurants, grocery, and a variety of retail stores are proposed.

The Master Plan area includes two existing zoning designations as shown in Exhibit 2-5. Approximately 20 acres of the project site abutting E. Gerard Avenue is zoned "R-3-2," Medium Density Residential and approximately 57.5 acres located on both sides of Campus Parkway is zoned "C-C," Central Commercial District.

Table 3.8-1 shows the square footage of the proposed Master Plan Program parcels. The parcels are outlined on the Conceptual Site Plan (Exhibit 2-7).

Table 3.8-1: Master Plan Program

Name	Area (square feet)
Fire Station Parcel	66,807
Residential Parcel	366,216
North Parcel	1,791,131
South Parcel	939,010

Surrounding Land Uses

Table 3.8-2 summarizes the General Plan and zoning for the land uses that surround the Master Plan area.

Table 3.8-2: Surrounding Land Use Designations

Land Use	Relationship to Project Site	Land Use Designation	
		General Plan	Zoning
Pioneer Elementary School	West	School	R-1-6
Undeveloped/vacant	West	Thoroughfare Commercial	P-D
Undeveloped/vacant	North	Low Density Residential	R-1-5
Undeveloped/vacant	East	Business Park	A-1-20
Undeveloped/vacant	South	Commercial Reserve	A-1 (Merced County)
Sources: City of Merced, 2016; County of Merced, 2016.			

3.8.3 - Regulatory Framework

Federal

There are no federal plans, policies, regulations, or laws related to land use that are applicable to the proposed project.

State

There are no state plans, policies, regulations, or laws related to land use that are applicable to the proposed project.

Local

City of Merced

General Plan

The Merced Vision 2030 General Plan (General Plan) serves as a "blueprint" for growth within the Merced city limits, and identifies goals, policies, and programs to guide the direction of growth desired by the community. Policies with relevance to the Master Plan and physical environmental impacts related to implementation of the proposed project are contained within the various elements of the General Plan. The Merced City Council adopted the current General Plan in 2012.

The following are summaries of applicable land use designations set forth in the General Plan.

HMD (High-Medium Density Residential)

This designation provides areas for multi-family development such as apartments, higher density triplex/fourplex units, and condominiums.

RC (Regional/Community Commercial)

This designation provides community and regional commercial centers with a full depth and variety of retail goods, general merchandise, apparel, and home furnishings, with one or more major department stores as key tenants.

Merced Municipal Code

The Merced Municipal Code sets forth regulations to ensure that development and land use activities protect and promote the health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in the City. The Merced Municipal Code consists of all ordinances adopted by the Merced City Council.

Other Regulations

The City has standards and conditions related to environmental review, general plan amendments, subdivision standards, grading standards, traffic and school mitigation, floodplain management, construction and fire standards, and other areas that are intended to reduce environmental impacts of development projects. Many of these existing regulations are relevant for reducing environmental impacts of the proposed project and are referenced throughout this document in the environmental topic section where they are relevant.

3.8.4 - Methodology

Land use planning impacts are evaluated in this section by determining if the proposed project is in compliance with city goals, policies, and other relevant policy documents. This is done through site reconnaissance, use of aerial photos, and review of applicable land use policy documents, such as the General Plan and Municipal Code. Photos of the project site and surrounding areas were also taken to document existing conditions. The analysis focuses specifically on policies that, if violated, may contribute to some direct or reasonably foreseeable indirect environmental impact. This section also analyzes the compatibility of the proposed project with surrounding existing and proposed land uses. Incompatible land uses can create significant environmental impacts for both the proposed use and the existing use.

3.8.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether land use and planning impacts are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

a) Physically divide an established community?

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

c) Conflict with any applicable habitat conservation plan or natural communities conservation plan?

3.8.6 - Project Impact Analysis and Mitigation Measures

This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.

Divide an Established Community

Impact LU-1:	**The project would not physically divide an established community.**

Impact Analysis

The proposed Master Plan boundaries encompass approximately 77 acres and contain undeveloped properties contemplated for high- to medium-density residential and regional commercial development. The established community to the north and west of the Master Plan area includes residential uses as well as an elementary school. Vacant lands to the south and east are designated for commercial and business park use. Implementation of the Master Plan will not limit access to the established community. Additionally, the Master Plan would also be consistent with the General Plan, which provides for the logical and orderly growth of the Plan Area, includes land uses that are compatible with surrounding land uses, and is consistent with goals, policies, and programs of the General Plan including identified densities and phasing. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Conflict with Applicable Plans, Policies, or Regulations

Impact LU-2:	**The project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.**

Impact Analysis

The Master Plan complies with the land uses and intensity of uses allowed under the General Plan. In addition, the Master Plan conforms to the goals identified in the General Plan.

General Plan Land Use Designation Consistency Analysis

The proposed Master Plan includes a maximum of 178 residential units and 601,127 square feet of commercial. Table 3.8-3 identifies potential locations for program components and includes lettered building pads that correspond with Table 3.8-1, Master Plan Program. Future developers will be able to rearrange these components and adjust building square footage as long as they do not exceed the maximum permitted square feet. Table 3.8-1 groups the Master Plan program components into four parcels, based on physical location and land use.

Implementation of the Master Plan would be in accordance with the General Plan's policies to maintain and enhance the quality of the City's residential neighborhoods, increase economic and business development, as well as encourage urban growth and design. Because the proposed Master Plan seeks to implement this aspect of the General Plan, Table 3.8-3 provides a consistency analysis with applicable policies identified in the General Plan for the Master Plan area.

Table 3.8-3: General Plan Consistency Analysis

Element	Goal/Objective/Policy		Consistency Determination
	No.	Text	
Residential & Neighborhood Development	Policy L-1.1	Promote balanced development which provides jobs, services and housing.	**Consistent:** The Master Plan promotes a balance of both commercial and residential development. Although the plan reduces the acreage of medium density residential designation, the concept includes a 178-unit high-density residential complex

Table 3.8-3 (cont.): General Plan Consistency Analysis

Element	Goal/Objective/Policy		Consistency Determination
	No.	Text	
			that remains consistent with the estimated number of unit count in the General Plan. This allows for both development of adequate housing and a larger acreage for commercial development.
	Policy L-1.2	Encourage a diversity of building types, ownership, prices, designs, and site plans for residential areas throughout the City.	**Consistent:** The Merced Gateway includes a mix of uses including fire station development, residential, and commercial development.
	Policy L-1.3	Encourage a diversity of lot sizes in residential subdivisions.	**Consistent:** The proposed project includes a maximum of 178 units permitting a density of anywhere between 12-24 du/ac.
	Policy L-1.7	Encourage the location of multi-family developments on sites with good access to transportation, shopping, employment centers, and services.	**Consistent:** The Master plan area designates 8.4 acres as High-Medium Density Residential. This multi-family complex would help meet the City's regional housing allocation goals in the Housing Element of the General Plan.
	Policy L-1.8	Create livable and identifiable residential neighborhoods.	**Consistent:** The 178-unit multi-family complex provides an identifiable neighborhood with plans for a 2,500-square-foot clubhouse and a pool. Along with this, the architectural design concepts include a landscape buffer between the parking and street, tower elements, and walkable areas around the residential community.
	Policy L-1.9	Ensure connectivity between existing and planned urban areas.	**Consistent:** The project aims to provide visitors and residents connectivity to shopping, dining, and a variety of living experiences. The present Campus Parkway, a four-lane expressway, and other roadways will facilitate this. A main goal in the Master Plan also includes a connection from Gerard Avenue to Campus Parkway by connecting Coffee Street.

Table 3.8-3 (cont.): General Plan Consistency Analysis

Element	Goal/Objective/Policy		Consistency Determination
	No.	Text	
	Goal L-1-1	Housing opportunities in Balance with Jobs Created in the Merced Urban Area	**Consistent:** The multi-family complex coincides with the development of commercial uses in order to create a balanced mixed-use project.
	Goal L-1-2	A Wide Range of Residential Densities and Housing Types in the City	**Consistent:** The development of the High-Medium Density Residential area provides for multi-family housing compared with existing Low Density Residential housing to the North of the site.
	Goal L-1-3	Preservation and Enhancement of Existing Neighborhoods	**Consistent:** The project enhances the aesthetics of both the site and areas surrounding the Master Plan area.
	Goal L-1-4	Quality Residential Environments	**Consistent:** The 178-unit multi-family complex provides an identifiable neighborhood with plans for a 2,500-square-foot clubhouse and a pool. Along with this, the architectural design concepts include a landscape buffer between the parking and street, tower elements, and walkable areas around the residential community.
	Goal L-1-5	Mixed-use, Transit and Pedestrian-Friendly Residential Environments	**Consistent:** Though not a mixed-use project, it adds multi-family dwellings and commercial uses to a neighborhood that has single-family homes, a school, and planned parks. Internally, the project includes an on-site bus stop and pedestrian walkways, Externally, public streets will include parkstrips, sidewalks, bikelanes, and a multi-use path. Through project mitigation (Section 3-3, Air Quality/ Greenhouse Gas Emissions), continuous, convenient, and safe pedestrian and bicycle improvements will connect the project to the surrounding neighborhood.

Table 3.8-3 (cont.): General Plan Consistency Analysis

Element	Goal/Objective/Policy		Consistency Determination
	No.	Text	
	Goal L-1-6	Ensure Adequate Housing is Available to All Segments of the population	**Consistent:** The development of multi-family housing ensures that a range of adequate housing types is available to the population in livable and prosperous areas of the City.
Economic & Business Development	Policy L-2.1	Encourage further development of appropriate commercial and industrial uses throughout the City.	**Consistent:** The proposed project is intended to include up to 385,535 square feet of commercial uses in the North Parcel and 242,592 square feet of commercial uses in the South Parcel.
	Policy L-2.3	Promote the retention and expansion of existing industrial and commercial business.	**Consistent:** The policy is not applicable to the project.
	Policy L-2.5	Maintain attractive industrial areas and business parks.	**Consistent:** The policy is not applicable to the project.
	Policy L-2.6	Provide neighborhood commercial centers in proportion to residential development in the City.	**Consistent:** The development of both new residential and commercial hubs for southeast Merced ensures a proportionate development of residential and commercial centers within the City.
	Policy L-2.7	Locate and design new commercial development to provide good access from adjacent neighborhoods and reduce congestion on major streets.	**Consistent:** Internally, the project includes an on-site bus stop and pedestrian walkways, Externally, public streets will include parkstrips, sidewalks, bikelanes, and a multi-use path. Through project mitigation (Section 3-3, Air Quality/Greenhouse Gas Emissions), continuous, convenient, and safe pedestrian and bicycle improvements will connect the project to the surrounding neighborhood.
	Policy L-2.8	Encourage a mixture of uses, activities, and reinvestment that will maintain the vitality of the downtown area.	**Consistent:** The policy is not applicable to the project.
	Policy L-2.10	Encourage well-planned freeway-oriented developments.	**Consistent:** The project intends to create highway-oriented commercial uses on a highly visible site near SR-99 in order to cater to residents and visitors.

Table 3.8-3 (cont.): General Plan Consistency Analysis

Element	Goal/Objective/Policy		Consistency Determination
	No.	Text	
	Goal L-2-1	Increased Employment Opportunities for the Citizens of Merced	**Consistent:** Citizens of Merced will have a new source of job opportunities in the commercial sector from the future development of this project.
	Goal L-2-2	A Diverse and balanced Merced Economy	**Consistent:** The mix of commercial uses proposed by the Master Plan ensures a balance of diverse areas of retail for the City.
	Goal L-2-3	Preservation and Expansion of the City's Economic Base	**Consistent:** The project expands the economic base for the City by installing new retail areas and ensuring ease of access for residents and visitors.
	Goal L-2-6	Ready Access to Commercial Centers and Services Throughout the City	**Consistent:** The project enhances connectivity to future commercial areas and current and future residential areas. The Master Plan provides a connection for S. Coffee Street.
	Goal L-2-7	A Distinguished Downtown	**Consistent:** The policy is not applicable to the project.
Urban Growth and Design	Policy L-3.1	Create land use patterns that will encourage people to walk, bicycle, or use public transit for an increase number of their daily trips.	**Consistent:** The proximity of the retail stores, grocery stores, and restaurants to nearby neighborhoods provides a land use pattern that encourages people to walk, bicycle or to use public transit.
	Policy L-3.2	Encourage infill development and a compact urban form.	**Consistent:** The policy is not applicable to the project.
	Policy L-3.3	Promote site designs that encourage walking, cycling, and transit use.	**Consistent:** Internally, the project includes an on-site bus stop and pedestrian walkways, Externally, public streets will include parkstrips, sidewalks, bikelanes, and a multi-use path. Through project mitigation (Air Quality Section), continuous, convenient and safe pedestrian and bicycle improvements will connect the project to the surrounding neighborhood.

Table 3.8-3 (cont.): General Plan Consistency Analysis

Element	Goal/Objective/Policy		Consistency Determination
	No.	Text	
	Policy L-3.4	Build identity, character, and enhanced community design in the South Merced Community Plan area.	**Consistent:** The policy is not applicable to the project.
	Goal L-3-1	Living Environments which Encourage People to Use a Variety of Transportation Alternatives	**Consistent:** Internally, the project includes an on-site bus stop and pedestrian walkways, Externally, public streets will include parkstrips, sidewalks, bikelanes, and a multi-use path. Through project mitigation (Air Quality Section), continuous, convenient and safe pedestrian and bicycle improvements will connect the project to the surrounding neighborhood.
	Goal L-3-2	A Compact Urban Village Design for New Growth Areas	**Consistent:** The policy is not applicable to the project.
	Goal L-3-3	Self-sustaining, Mixed-Use, Pedestrian-Friendly Neighborhoods	**Consistent:** Pedestrians are able to access both residential and commercial hubs under the proposed Master Plan. The presence of a variety of uses also allows people to condense shopping trips to multiple stores in just one location. This reduces vehicle miles traveled and resulting emissions, and promotes a self-sustaining mixed-use neighborhood for nearby residents.
Source: City of Merced, 2016.			

Based on the analysis provided in Table 3.8-3, impacts associated with consistency of the proposed Master Plan with the General Plan would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Conflict with Conservation Plans

Impact LU-3:	**The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan.**

Impact Analysis

According to the General Plan, the Master Plan area is not located within an adopted or proposed conservation plan area. There would be no impact to an adopted or proposed habitat conservation plan or natural communities conservation plan.

Level of Significance Before Mitigation

No impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

No impact.

THIS PAGE INTENTIONALLY LEFT BLANK

3.9 - Noise

3.9.1 - Introduction

This section describes the existing noise setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based, in part, on noise modeling performed by FirstCarbon Solutions. The noise modeling output is included in this EIR as Appendix F.

3.9.2 - Environmental Setting

Fundamentals of Noise

Noise is usually defined as unwanted sound. Several noise measurement scales exist that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are typically, only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness. Only audible changes in existing ambient or background noise levels are considered potentially significant as described more fully below, pursuant to applicable noise standards.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level. Noise levels diminish or attenuate as distance from the source increases based on an inverse square rule, depending on how the noise source is physically configured. Noise levels from a single-point source, such as a single piece of construction equipment at ground level, attenuate at a rate of 6 dB for each doubling of distance (between the single-point source of noise and the noise-sensitive receptor of concern). Heavily traveled roads with few gaps in traffic behave as continuous line sources and attenuate roughly at a rate of 3 dB per doubling of distance.

Sound intensity is normally measured through the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Table 3.9-1 shows some representative noise sources and their corresponding noise levels in dBA.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound, including during sensitive times of the day and night. The predominant rating scales in the State of California are the equivalent continuous sound level (L_{eq}), the day-night average level (L_{dn}) based on A-weighted decibels (dBA), and the community noise equivalent level (CNEL). The L_{eq} is the total sound energy of time-varying noise over a sample period. The L_{dn} is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 10 decibels to sound levels at night between 10:00 p.m. and 7:00 a.m. The CNEL is similar to the L_{dn}, except that it has another addition of 4.77 dB to sound levels during the evening hours between 7:00

p.m. and 10:00 p.m. These additions are made to the sound levels during evening and nighttime hours because there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds compared with daytime hours. Many local jurisdictions rely on the CNEL noise standard to assess transportation-related impacts on noise-sensitive land uses.

Table 3.9-1: Typical A-Weighted Noise Levels

Indoor Noise Source	Noise Level (dBA)	Outdoor Noise Sources
(Threshold of Hearing in Laboratory)	0	—
Library	30	Quiet Rural Nighttime
Refrigerator Humming	40	Quiet Suburban Nighttime
Quiet Office	50	Quiet Urban Daytime
Normal Conversation at 3 feet	60	Normal Conversation at 3 feet
Vacuum Cleaner at 10 feet	70	Gas Lawn Mower at 100 feet
Hair Dryer at 1 foot	80	Freight Train at 50 feet
Food Blender at 3 feet	90	Heavy-duty Truck at 50 feet
Inside Subway Train (New York)	100	Jet Takeoff at 2,000 feet
Smoke Detector Alarm at 3 feet	110	Unmuffled Motorcycle
Rock Band near stage	120	Chainsaw at 3 feet
—	130	Military Jet Takeoff at 50 feet
—	140	(Threshold of Pain)
Source: Compiled by FirstCarbon Solutions, 2014.		

Noise standards in terms of percentile exceedance levels, L_n, are often used together with the maximum noise level (L_{max}) for noise enforcement purposes. When specified, the percentile exceedance levels are not to be exceeded by an offending sound over a stated time period. For example, the L_{10} noise level represents the level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level (which means that the noise level exceeds the L_{50} noise level half of the time, and is less than this level half of the time). The L_{90} noise level represents the noise level exceeded 90 percent of the time, and is considered the lowest noise level experienced during a monitoring period. The L_{90} noise level is normally referred to as the background noise level. For a relatively steady noise, the measured L_{eq} and L_{50} are approximately the same.

When assessing the annoyance factor, other noise rating scales of importance include the L_{max}, which is the highest exponential time averaged sound level that occurs during a stated time period. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Construction Noise Fundamentals

Construction is performed in discrete steps or phases, each of which has its own mix of equipment, and consequently, its own noise characteristics. Typical phases of construction include demolition, excavation, grading, and building construction. 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. Construction-period noise levels are higher than background ambient noise levels, but eventually cease once construction is complete. Table 3.9-2 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

Table 3.9-2: Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Pickup Truck	No	55
Pumps	No	77
Air Compressors	No	80
Backhoe	No	80
Front-End Loaders	No	80
Portable Generators	No	82
Dump Truck	No	84
Tractors	No	84
Auger Drill Rig	No	85
Concrete Mixer Truck	No	85
Cranes	No	85
Dozers	No	85
Excavators	No	85
Graders	No	85
Jackhammers	Yes	85
Man Lift	No	85
Paver	No	85
Pneumatic Tools	No	85
Rollers	No	85
Scrapers	No	85
Concrete/Industrial Saws	No	90
Impact Pile Driver	Yes	95

Table 3.9-2 (cont.): Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Vibratory Pile Driver	No	95
Source: FHWA, 2006.		

Groundborne Vibration Fundamentals

Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. When assessing annoyance from groundborne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 microinch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB."

In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include construction activities such as blasting, pile driving and operating heavy earthmoving equipment. However, construction vibration impacts on building structures are generally assessed in terms of peak particle velocity (PPV). For purposes of this analysis, project-related impacts are expressed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 3.9-3.

Table 3.9-3: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Water Trucks	0.001	57
Scraper	0.002	58
Bulldozer–small	0.003	58
Jackhammer	0.035	79
Concrete Mixer	0.046	81
Concrete Pump	0.046	81
Paver	0.046	81
Pickup Truck	0.046	81
Auger Drill Rig	0.051	82
Backhoe	0.051	82
Crane (Mobile)	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86

Table 3.9-3 (cont.): Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Bulldozer–Large	0.089	87
Caisson drilling	0.089	87
Vibratory Roller (small)	0.101	88
Compactor	0.138	90
Clam shovel drop	0.202	94
Vibratory Roller (large)	0.210	94
Pile Driver (impact-typical)	0.644	104
Pile Driver (impact-upper range)	1.518	112
Source: Compilation of scientific and academic literature, generated by FTA and FHWA.		

Propagation of vibration through soil can be calculated using the vibration reference equation of

PPV= PPV ref * (25/D)^n (in/sec)

Where:

PPV = reference measurement at 5 feet from vibration source
D = distance from equipment to property line
n= vibration attenuation rate through ground

According to Chapter 12 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (Federal Transit Administration, 2006) manual, an "n" value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.

Existing Conditions

The project site is bordered to the west by school and undeveloped land uses; to the north are planned and existing single-family residential land uses; while undeveloped land that was previously used for cultivated agriculture is located to the east and south of the project site along with a few low-density single-family residential properties.

Existing Noise Sources

Traffic noise along State Route 99 (SR-99) is the dominant noise source in the project vicinity. Other noise sources in the project vicinity include traffic noise on local roadways and stationary noise sources such as agricultural activity on surrounding agricultural land uses in the project vicinity. The existing ambient noise environment is described below.

Existing Traffic Noise

Traffic noise levels along roadway segments in the project vicinity were calculated using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108). This model requires parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The daily traffic volumes were obtained from the traffic analysis prepared by KD Anderson & Associates, Inc. as presented in Section 3.12, Transportation and Traffic. The traffic volumes correspond to the existing plus approved projects conditions traffic scenario as described in the transportation analysis. The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA CNEL noise contour distances for existing and existing-plus-project traffic conditions—are provided in Appendix F of this document. A summary of the modeling results is shown in Table 3.9-4.

Table 3.9-4: Existing (EPAP[1]) Traffic Noise Levels[2]

Roadway Segment	Approximate ADT	Center-line to 70 CNEL (feet)	Center-line to 65 CNEL (feet)	Center-line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Campus Parkway–Coffee Street to Central Avenue	5,700	<50	75	156	65.1
Campus Parkway–Central Avenue to Pluim Drive	5,700	<50	75	156	65.1
Campus Parkway–Pluim Drive to Gerard Avenue	5,700	<50	75	156	65.1
Coffee Street–Gerard Avenue to Parsons Avenue	470	<50	<50	< 50	50.9
Coffee Street–Parsons Avenue to Campus Parkway	5,900	<50	<50	75	61.9
Coffee Street–Campus Parkway to Mission Avenue	2,500	<50	<50	< 50	58.2
Parsons Avenue–Gerard Avenue to Coffee Street	3,900	<50	<50	89	61.3
Gerard Avenue—West of Coffee Street	1,400	<50	<50	< 50	58.3
Gerard Avenue–Coffee Street to Pluim Drive	810	<50	<50	< 50	56.0
Gerard Avenue–Pluim Drive to Campus Parkway	1,100	<50	<50	< 50	57.3
SR-99–at Mission Avenue	44,000	532	1,143	2,461	80.0

Notes:
[1] EPAP = Existing plus approved projects scenario as described in the traffic analysis.
[2] Modeling results do not take into account mitigating features such as topography, vegetative screening, fencing, building design, or structure screening. Rather it assumes a worst case of having a direct line of site on flat terrain.
Source: FirstCarbon Solutions, 2016.

The southern parcel of the project site is located, at the nearest point, approximately 660 feet from the centerline of SR-99. At this distance, existing traffic noise levels would range up to 64.8 dBA CNEL at the southern parcel's nearest project boundary to SR-99. The northern parcel of the project site is located, at the nearest point, approximately 1,200 feet from the centerline of SR-99. At this distance, existing traffic noise levels would range up to 59.6 dBA CNEL at the northern parcel's nearest project boundary to SR-99.

3.9.3 - Regulatory Framework

Federal Regulations

United States Environmental Protection Agency

In 1972, Congress enacted the Noise Control Act. This act authorized the United States Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) categories, as shown in Table 3.9-5. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of achieving the levels.

Table 3.9-5: Summary of EPA Recommended Noise Levels to Protect Public Welfare

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.
Source: EPA, 1974.		

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq}(24)$ of 70 dBA. The "(24)" signifies an L_{eq} duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication from a distance of approximately 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Federal Transit Administration

The Federal Transit Administration (FTA) has established industry-accepted standards for vibration impact criteria and impact assessment. These guidelines are published in the FTA's Transit Noise and Vibration Impact Assessment document (FTA 2006). The FTA guidelines include thresholds for construction vibration impacts for various structural categories, as shown in Table 3.9-6.

Table 3.9-6: Federal Transit Administration Construction Vibration Impact Criteria

Building Category	PPV (in/sec)	Approximate VdB
I. Reinforced-Concrete, Steel or Timber (no plaster)	0.5	102
II. Engineered Concrete and Masonry (no plaster)	0.3	98
III. Non Engineer Timber and Masonry Buildings	0.2	94
IV. Buildings Extremely Susceptible to Vibration Damage	0.12	90
Source: Federal Transit Administration, 2006.		

State Regulations

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor-ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise and land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. The City of Merced has adopted and modified the State's land use compatibility guidelines, as discussed below.

Local Regulations

City of Merced General Plan

The City addresses noise in the Noise Element of the General Plan. The City also addresses noise in the Municipal Code; however, the restrictions on noise contained in the code are applicable to land uses or control of animal noises, and as such are not applicable to implementation of this project. The applicable goals and policies of the Noise Element that are relevant to the analysis are listed below.

Policies

- **Policy N-1.1:** Minimize the impacts of aircraft noise.
- **Implementing Action 1.1.c:** Follow the recommendations stated in the Merced Regional Airport Master Plan and the Merced County Airport Land Use Compatibility Plan, such as limitations on occupancy and density levels, and restrictions on certain land uses near airports.
- **Policy N-1.2:** Reduce surface vehicle noise.
- **Implementing Action 1.2.c:** New development of noise-sensitive land uses may not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table N-3, unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels specified in Table N-3.
- **Implementing Action 1.2.d:** Noise created by new transportation noise sources shall be mitigated to the extent feasible so as not to exceed the levels specified in Table N-3 at outdoor activity areas or interior spaces of existing noise-sensitive land uses.
- **Implementing Action 1.2.e:** It is anticipated that roadway improvement projects will be needed to accommodate build-out of the General Plan. Therefore, existing noise-sensitive uses may be exposed to increased noise levels due to roadway improvement projects as a result of increased roadway capacity, increases in travel speeds, etc. It may not be practical to reduce increased traffic noise levels consistent with those contained Table N-3. Therefore, as an alternative, the following criteria may be used for roadway improvement projects:
  - Where existing traffic noise levels are less than 60 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +5 dB L_{dn} increase in noise levels due to roadway improvement projects should be mitigated to the extent feasible; and,
  - Where existing traffic noise levels range between 60 and 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +3 dB L_{dn} increase in noise levels due to roadway improvement projects should be mitigated to the extent feasible; and,
  - Where existing traffic noise levels are greater than 65 dB L_{dn} at the outdoor activity areas of noise-sensitive uses, a +1.5 dB L_{dn} increase in noise levels due to roadway improvement projects should be mitigated to the extent feasible.
- **Policy N-1.3:** Reduce equipment noise levels.
- **Implementing Action 1.3.a:** Limit operating hours for noisy construction equipment used in the City of Merced.
- **Policy N-1.4:** Reduce noise levels at the receiver where noise reduction at the source is not possible.
- **Implementing Action 1.4.a:** Require new residential projects to meet acceptable noise level standards as follows:
  - A maximum of 45 dB L_{dn}/CNEL for interior noise level for residential projects.

  - A maximum of 65 dB L_{dn}/CNEL for exterior noise level for residential projects proximate to major road way and railroad corridors. For other arterial, collector and local streets a maximum of 60 dB L_{dn}/CNEL exterior noise with a maximum of 65 dB L_{dn}/CNEL when all the best available noise-reduction techniques have been exhausted without achieving 60 dB, and the strict application of such a maximum becomes a hindrance to development needed or typical for an area.
- **Implementing Action 1.4.c:** Use the "normally acceptable" noise levels as established in the "Noise and Land Use Compatibility Guidelines" for the review of non-residential land uses.
  - Where it is not possible to reduce noise levels at the source, the City will seek to minimize noise levels at the receiver through the above Implementing Actions. Noise abatement techniques are varied, but include sound walls or barriers, landscaping, additional building insulation for noise, strategic placement of windows and bedrooms away from noise sources, site and building designs to shield outdoor spaces from excessive noise, etc.
- **Policy N-1.5:** Coordinate planning efforts so that noise-sensitive land uses are not located near major noise sources.
- **Implementing Action 1.5.a:** New development of noise-sensitive uses should not be allowed where the noise level due to noise sources will exceed the exterior noise level standards of Table N-1 [Table 3.9-7] as measured immediately within the property line or within a designated outdoor activity area (at the discretion of the Director of Development Services) of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified in Table N-1 [Table 3.9-7].
- **Implementing Action 1.5.b:** Noise created by new proposed non-transportation noise sources should be mitigated to the extent feasible so as not to exceed the exterior noise level standards of Table N-1 [Table 3.9-7] as measured immediately within the property line of lands designated for noise-sensitive uses.
- **Implementing Action 1.5.c:** The City of Merced shall also apply an interior maximum nighttime noise level criterion (L_{max}) of 50 dB in bedrooms for new residential uses affected by a non-transportation noise source.
- **Implementing Action 1.5.d:** Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table N-1 [Table 3.9-7], or the maximum interior noise level criterion, at existing or planned noise-sensitive uses, an acoustical analysis, at the discretion of the Director of Development Services, may be required as part of the environmental review process so that noise mitigation may be included in the project design.
- **Implementing Action 1.5.f:** As feasible, require noise barriers and/or increased setbacks between heavy circulation corridors and noise-sensitive land uses.
- **Policy N-1.6:** Mitigate all significant noise impacts as a condition of project approval for sensitive land uses.
- **Implementing Action 1.6.a:** Where noise mitigation measures are required to achieve the standards of Tables N-1 [Table 3.9-7] and N-3 [Table 3.9-8], the emphasis of such measures should be placed upon site planning and project design. The use of noise barriers should be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.
- **Implementing Action 1.6.b:** Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table N-3 [Table

3.9-8] or the performance standards of Table N-1 [Table 3.9-7], an acoustical analysis may be required as part of the environmental review process so that noise mitigation may be included in the project design.

Table 3.9-7: Exterior Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Noise Sources

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq}, dB	55	45

Note:
Each of the noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises (e.g., humming sounds, outdoor speaker systems). These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

Table 3.9-8: Maximum Allowable Noise Exposure Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB			Interior Spaces	
	Roadways	Railroads	Aircraft	L_{dn}/CNEL, dB	L_{dn}dB[2]
Residential	60/65[3]	65[5]	60[3]	45	—
Transient Lodging	65[4,5]	65[4,5]	65[4,5]	45	—
Hospitals, Nursing Homes	60[3]	65[5]	60[3]	45	—
Theaters, Auditoriums, Music Halls	—			—	35
Churches, Meeting Halls	60[3]	65[5]	60[3]	—	40
Office Buildings	—			—	45
Schools, Libraries, Museums	—			—	45
Playgrounds, Neighborhood Parks	70		75	—	—

Notes:
1 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. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
2 As determined for a typical worst-case hour during periods of use.
3 Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table. For residential uses located adjacent to major roadways such as S.R. 99, S.R. 59, and S.R. 140, the normally acceptable exterior noise level is 65 dB L_{dn}/CNEL.
4 In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.
5 Where it is not possible to reduce noise in outdoor activity areas to 65 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 70 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
Source: Merced Vision 2030 General Plan, 2012.

3.9.4 - Methodology

Traffic Noise Modeling Methodology

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions in the vicinity of the project site. Traffic data used in the model was obtained from the traffic impact analysis prepared by KD Anderson & Associates for the project. The resultant noise levels were weighed and summed over a 24-hour period in order to determine the L_{dn} values. The FHWA-RD-77-108 Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level. Adjustments are then made to this level to account for the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway); the total average daily traffic (ADT); the percentage of ADT that flows during the day, evening, and night; the travel speed; the vehicle mix on the roadway; a percentage of the volume of automobiles, medium trucks, and heavy trucks; the roadway grade; the angle of view of the observer exposed to the roadway; and the site conditions ("hard" or "soft") as they relate to the absorption of the ground, pavement, or landscaping.

The level of traffic noise depends on three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the FHWA community noise assessment criteria, this change is "barely perceptible." For reference, a doubling of perceived noise levels would require an increase of approximately 10 dBA. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

The model analyzed the noise impacts from the nearby roadways onto the project vicinity, which consists of the area that has the potential of being impacted from the on-site noise sources as well as the project-generated traffic on the nearby roadways**.** Analyses of the roadways were based on a single-lane-equivalent noise source combining both directions of travel. A single-lane-equivalent noise source occurs when the vehicular traffic from all lanes is combined into a theoretical single-lane that has a width equal to the distance between the two outside lanes of a roadway, which provides almost identical results to analyzing each lane separately where elevation changes are minimal.

3.9.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, noise impacts resulting from the implementation of the project would be considered significant if the project would cause:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? (Refer to Section 7, Effects Found not to be Significant.)

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? (Refer to Section 7, Effects Found not to be Significant.)

3.9.6 - Project Impacts and Mitigation Measures

This section discusses potential environmental impacts associated with the project and provides feasible mitigation measures where necessary.

Exposure of People to or Generation of Noise Levels in Excess of Established Standards

Impact NOI-1:	**Implementation of the project would result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.**

Impact Analysis

This analysis discusses potential project impacts related to short-term construction noise, on-site operational traffic noise, and on-site operational stationary noise. Each is discussed below.

Short-Term Construction Noise Impacts

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. As noted previously, a characteristic of noise is that a doubling of sound sources with equal strength is required to result in a perceptible increase (defined to be a minimum 3-dBA increase) in noise level. Project daily construction trips would not result in a doubling of traffic volumes along any roadway segment in the project vicinity. Therefore, although there would be a relatively high single event noise exposure potential causing intermittent noise nuisance, the effect on longer term (hourly or daily) ambient noise levels would be small. Thus, short-term, construction-related impacts associated with worker commute and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during demolition, site preparation and construction on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site 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 3.9-2 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. 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.

The loudest individual pieces of construction equipment expected to operate on the project site include scrapers, bulldozers, roller compactors, and graders, which, as shown in Table 3.9-2, produce typical maximum noise levels ranging up to approximately 85 dBA L_{max} at 50 feet. Each doubling of the sound sources with equal strength would increase the noise level by 3 dBA. Assuming each piece of construction equipment operates at some distance apart from the other equipment, the worst-case combined noise level at the nearest uses to the site during this phase of construction would be 90 dBA L_{max} at a distance of 50 feet from an active construction area with multiple pieces of construction equipment operating simultaneously at full power.

The closest noise-sensitive land uses to the west of the project site is the school land use on the west side of Coffee Street. The nearest façades of these buildings are located approximately 75 feet from the project boundary and approximately 100 feet from the nearest project construction footprint where heavy construction equipment would be operating. Thus, maximum noise levels from construction activities could range up to approximately 84 dBA L_{max} at the nearest façade of these residences if multiple pieces of heavy construction equipment operated simultaneously at the nearest project construction footprint.

The closest noise-sensitive land uses to the north of the project site are the single-family residential land uses on Petaluma Court north of E. Gerard Avenue. The nearest façade of these residences is located approximately 95 feet from the project boundary and approximately 125 feet from the nearest project construction footprint where heavy construction equipment would be operating. In addition, these homes are protected from direct line of sight to the project site by an 8-foot-high soundwall, which would conservatively provide a minimum shielding of 6 dBA reduction from on-site construction noise. Thus, maximum noise levels from construction activities could range up to approximately 76 dBA L_{max} at the nearest façade of these residences if multiple pieces of heavy construction equipment operated simultaneously at the nearest project construction footprint.

The closest noise-sensitive land uses to the south of the project site are single-family residential land uses on Lawndale Avenue, approximately 160 feet from the project construction footprint. At this distance, maximum noise levels from construction activities could range up to approximately 80 dBA L_{max} at the nearest façade of these residences if multiple pieces of heavy construction equipment operated simultaneously at the nearest project construction footprint.

These construction noise levels could result in sleep disturbance at these nearest residential land uses if project construction activities are not restricted to daytime hours. However, restrictions on the permissible hours of construction, as well as implementation of industry standard noise-reducing best management practices would reduce this impact to a less than significant level.

Traffic Noise Impacts

A significant impact would occur if the project would be exposed to noise levels of the City's maximum allowable noise exposure standard from transportation noise sources shown in Table 3.9-8, above, for each type of proposed land use development.

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions in the vicinity of the project site. Traffic data used in the model was obtained from the traffic impact analysis prepared by KD Anderson & Associates for the project. The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA CNEL noise contour distances for existing and future year traffic conditions without and with the project—are provided in Appendix F of this document and summarized in Table 3.9-9 below. The modeling assumptions assume a direct line of sight, with no reductions assumed for topographical, vegetative, fencing, or structural screening.

Based on the traffic noise modeling results, the loudest projected traffic noise levels would occur under cumulative year 2035 conditions with implementation of the project. Under these conditions, the proposed residential land uses for the northern parcel of the proposed project would be exposed to maximum daily average traffic noise levels ranging up to 54.6 dBA CNEL from traffic on Coffee Street. The northern parcel of the project site is located, at the nearest point, approximately 1,600 feet from the centerline of SR-99. At this distance, traffic noise levels under year 2035 conditions would range up to 58.1 dBA CNEL at the northern parcel's nearest project boundary to SR-99, and up to 57.6 dBA CNEL from traffic on SR-99. The resulting combined traffic noise levels from traffic on Coffee Street and SR-99 would range up to 59.7 dBA CNEL at the nearest proposed residential façade to SR-99. These levels are below the City's maximum allowable threshold for transportation noise for new residential land use development. However, some residential land uses on the northern parcel would also experience noise levels ranging up to 65.3 dBA CNEL from traffic on Gerard Avenue. These noise levels would exceed the City's maximum allowable noise exposure threshold for transportation noise of 60 dBA CNEL for new residential development. This would be considered a significant impact. Therefore, mitigation must be incorporated into the project to reduce on-site traffic noise impacts.

Proposed hotel land uses on the southern parcel would be located approximately 735 feet from the centerline of SR-99. These land uses would be exposed to maximum daily average traffic noise levels ranging up to 64.6 dBA CNEL from traffic on Coffee Street and approximately 64.8 dBA CNEL from traffic on SR-99, with a resulting combined traffic noise level of approximately 67.7 dBA CNEL. These noise levels would exceed the City's maximum allowable noise exposure threshold for transportation noise of 65 dBA CNEL for new transient lodging types of land use development. This would be considered a significant impact. Therefore, mitigation must be incorporated into the project to reduce on-site traffic noise impacts.

Proposed commercial land uses on both the northern and southern parcels would be exposed to maximum daily average traffic noise levels ranging up to 72.2 dBA CNEL from traffic on Campus Parkway. However, the City does not have a maximum allowable exposure threshold for commercial land uses. Therefore, these traffic noise levels as measured at these proposed commercial land uses would not exceed established standards and would be considered a less than significant impact.

Table 3.9-9: Existing and Future Modeled Roadway Noise Levels[1]

Roadway Segment	L_{dn} (dBA) 50 feet from Centerline of Outermost Lane					
	EPAP[2] No Project	EPAP Plus Project	Increase over EPAP No Project (dBA)	Year 2035 No Project	Year 2035 Plus Project	Increase over Year 2035 No Project (dBA)
Campus Parkway–Coffee Street to Central Avenue	65.1	69.4	4.3	72.4	72.2	-0.2
Campus Parkway–Central Avenue to Pluim Drive	65.1	66.0	0.9	72.4	71.5	-0.9
Campus Parkway–Pluim Drive to Gerard Avenue	65.1	65.8	0.7	71.3	71.5	0.2
Coffee Street–Gerard Avenue to Parsons Avenue	50.9	52.5	1.6	54.2	54.6	0.4
Coffee Street–Parsons Avenue to Campus Parkway	61.9	65.9	4.0	65.2	66.1	0.9
Coffee Street–Campus Parkway to Mission Avenue	58.2	63.3	5.1	62.2	64.6	2.4
Parsons Avenue–Gerard Avenue to Coffee Street	61.3	60.9	-0.4	63.9	61.1	-2.8
Gerard Avenue–West of Coffee Street	58.3	59.4	1.1	63.6	63.9	0.3
Gerard Avenue–Coffee Street to Pluim Drive	56.0	58.9	2.9	65.4	65.3	-0.1
Gerard Avenue–Pluim Drive to Campus Parkway	57.3	59.4	2.1	66.0	66.6	0.6
SR-99–at Mission Avenue	80.0	80.3	0.3	80.8	81.0	0.2

Notes:
[1] Modeling results do not take into account mitigating features such as topography, vegetative screening, fencing, building design, or structure screening. Rather it assumes a worst case of having a direct line of site on flat terrain.
[2] EPAP = Existing plus approved projects scenario as described in the traffic analysis.
Source: FirstCarbon Solutions, 2015.

In order to reduce traffic noise impacts to the proposed residential land uses, the project shall incorporate a minimum 8-foot-high soundwall along Gerard Avenue bordering the proposed residential land use portion of the project. The soundwall should wrap around the west end of the residential portion of the project, along Coffee Street, for a minimum of 50 feet. In addition, the soundwall should wrap around the eastern end of the residential portion of the project, bordering the project entrance south of Daffodil Street, for a minimum distance of 50 feet. This measure would effectively reduce ground floor exterior noise levels at these receiving residential land uses to below 60 dBA CNEL.

However, these residential land uses are proposed to be multi-story, and therefore upper floors could still be exposed to traffic noise levels in excess of the City's interior noise standard of 45 dBA CNEL for residential land uses. Based on the EPA's Protective Noise Levels (EPA 550/9-79-100, November 1978), with a combination of walls, doors and windows, standard construction for northern California residential buildings would provide approximately 25 dBA in exterior to interior noise reduction with windows closed, and approximately 15 dBA with windows open. With windows open, interior living spaces for the proposed residential land uses for the northern parcel would not

meet the interior noise standard of 45 dBA CNEL (65.3 dBA–15 dBA = 50.3 dBA). Therefore, all proposed residential units with a direct line of sight to Gerard Avenue would require an alternative ventilation system, such as air conditioning, to ensure that windows can remain closed for a prolonged period of time in order to meet the interior noise standard. This noise reduction feature, as required by Mitigation Measure NOI-2, would reduce traffic noise impacts to meet the City's interior residential living space noise level standard of 45 dBA CNEL (65.3 dBA–25 dBA = 40.3 dBA) and would reduce on-site traffic noise impacts to less than significant.

In order to reduce traffic noise impacts to the proposed hotel land uses, the project must meet the City's maximum allowable noise exposure interior noise level standard of 45 dBA CNEL. Based on the EPA's Protective Noise Levels (EPA 550/9-79-100, November 1978), with a combination of walls, doors and windows, standard construction for northern California hotel buildings would provide approximately 25 dBA in exterior to interior noise reduction with windows closed, and approximately 15 dBA with windows open. With windows open, interior spaces for the proposed hotel land uses for the southern parcel would not meet the interior noise standard of 45 dBA CNEL (67.7 dBA–15 dBA = 52.7 dBA). Therefore, the proposed hotel land use would require an alternative ventilation system, such as air conditioning, to ensure that windows can remain closed for a prolonged period of time in order to meet the interior noise standard. This noise reduction feature, as required by Mitigation Measure NOI-2, would reduce traffic noise impacts to meet the City's interior noise level standard of 45 dBA CNEL (67.7 dBA–25 dBA = 42.7 dBA) for transient lodging land uses and would reduce on-site traffic noise impacts to less than significant.

Stationary Noise Impacts

A significant impact would occur if the project would include stationary operational noise sources that would result in noise levels in excess of 55 dBA $L_{eq(h)}$ between 7:00 a.m. and 10:00 p.m., or in excess of 45 dBA $L_{eq(h)}$ between 10:00 p.m. and 7:00 a.m. as measured at the outdoor active use areas of any residential land use.

The proposed project would generate noise from truck delivery, loading/unloading activities at the commercial loading areas, and parking lot activities such as people conversing, doors slamming, engine startup, and slow-moving vehicles, as well as from new exterior mechanical equipment sources, such as rooftop ventilation systems on proposed commercial land uses.

Representative parking activities, such as vehicles cruising at slow speeds, door slamming, or cars starting, would generate approximately 60 dBA to 70 dBA L_{max} at 50 feet. Conversation between two persons at a distance of 3 to 5 feet apart would generate a noise level of 60 dBA L_{eq} at 5 feet, or approximately 40 dBA L_{eq} as measured at 50 feet. The closest residential land use to the proposed project parking lots would be the single-family residential land use north of the project site on Petunia Court. This land use is located approximately 180 feet from the project's proposed commercial parking areas. At this distance and with a direct line of sight, parking lot activity could result in intermittent noise levels of up to 59 dBA L_{max}. However, this land use is shielded from direct line of sight to the project site by an approximately 8-foot-high soundwall, which would provide a minimum of 6 dBA reduction in noise levels from the activities at the proposed parking lots, resulting in a maximum exposure of 53 dBA L_{max} as measured at this off-site receptor. The on-site proposed residential land uses would also be exposed to noise from commercial parking lot activities. These

uses are located approximately 200 feet from the nearest proposed commercial parking areas, and would thus be exposed to noise levels from parking lot activities ranging up to 58 dBA L_{max}. Parking lot activities would be expected to occur sporadically throughout the day, as customers and employees arrive and leave the parking lot areas. As a result, noise from these activities, when averaged over an hour, would not result in an exceedance of the City's daytime exterior noise performance threshold of an hourly average of 55 dBA L_{eq}, as measured at any sensitive receptor in the project vicinity. In addition, because commercial uses would primarily not operate during nighttime hours, parking lot noise levels would not exceed the City's nighttime threshold of an hourly average of 45 dBA L_{eq}, as measured at any sensitive receptor in the project vicinity. Therefore, project-related parking lot activities would not result in exposure of persons to noise levels in excess of established standards.

Noise would also be generated by truck delivery, and loading/unloading activities at the loading areas of the proposed commercial uses. Typical noise levels from larger delivery truck loading and unloading activities can range from 75 dBA to 85 dBA L_{max} as measured at 50 feet. The typical truck unloading process takes an average of 15 to 20 minutes per hour, typically generating noise levels of up to approximately 60 dBA L_{eq} at a distance of 50 feet. The closest noise sensitive receptor to the proposed commercial loading areas would be the proposed residential land uses on the northern parcel. These land uses would be located approximately 300 feet from the project's proposed commercial loading areas. At this distance, activity at the project's loading areas could result in intermittent noise levels of up to 69.5 dBA L_{max} and a combined hourly average noise level of up to 44.5 dBA L_{eq}. This is below the City's daytime and nighttime exterior noise performance thresholds of an hourly average of 55 dBA L_{eq} and 45 dBA L_{eq}, respectively. Therefore, commercial truck loading/unloading activities would not result in exposure of persons to noise levels in excess of established standards.

At the time of preparation of this analysis, details were not available pertaining to mechanical ventilation systems for the commercial land uses of the proposed project. Therefore, a reference noise level for typical rooftop mechanical ventilation systems was used. Noise levels from typical rooftop mechanical ventilation equipment range up to approximately 60 dBA L_{eq} at a distance of 25 feet. The closest noise sensitive land use to potential commercial land use mechanical ventilation systems would be the proposed residential land uses on the northern parcel. Rooftop mechanical ventilation systems could be located as close as 200 feet from these residential land uses. At this distance, noise from rooftop mechanical ventilation equipment operation would attenuate to approximately 42 dBA L_{eq}. These noise levels are below the City's exterior daytime and nighttime noise performance thresholds of 55 dBA and 45 dBA L_{eq}, respectively. Therefore, noise from operation of mechanical ventilation systems for the commercial land uses of the proposed project would not result in exposure of persons to noise levels in excess of established standards.

In summary, on-site stationary operational noise levels would not exceed existing established thresholds and related impacts would be less than significant.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM NOI-1 To reduce potential construction noise impacts, the following multi-part mitigation measure shall be implemented for the project:

- The construction contractor shall ensure that all internal combustion engine-driven equipment is equipped with mufflers that are in good condition and appropriate for the equipment.
- The construction contractor shall locate stationary noise-generating equipment as far as feasible from sensitive receptors when sensitive receptors adjoin or are near a construction disturbance area. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- The construction contractor shall prohibit unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes is prohibited).
- The construction contractor shall locate, to the maximum extent practical, on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- The construction contractor shall limit all noise producing construction activities, including deliveries and warming up of equipment, to the hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday. No such work shall be permitted on Sundays or federal holidays without prior approval from the City.

MM NOI-2 To reduce potential traffic noise impacts, the following multi-part mitigation measure shall be implemented for the project:

- The project shall incorporate a minimum 8-foot-high soundwall along the Gerard Avenue bordering the proposed residential land use portion of the project. The soundwall shall wrap around the west end of the residential portion of the project, along Coffee Street, for a minimum of 50 feet. In addition, the soundwall should wrap around the eastern end of the residential portion of the project, along the project entrance south of Daffodil Street, for a minimum distance of 50 feet. The building plans approved by the City shall reflect this requirement.
- All proposed residential units with a direct line of sight to Gerard Avenue would require an alternative ventilation system, such as air conditioning, to ensure that windows can remain closed for a prolonged period of time. The building plans approved by the City shall reflect this requirement.
- The proposed hotel land use located on the southern parcel of the project site shall include an alternate form of ventilation, such as an air conditioning system, in order to ensure that windows can remain closed for a prolonged period of time. The building plans approved by the City shall reflect this requirement.

Level of Significance After Mitigation

Less than significant impact.

Exposure of People to or Generation of Excessive Groundborne Vibration or Noise

Impact NOI-2: The project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels.

Impact Analysis

This analysis discusses short-term construction and operational vibration impacts. Each is discussed separately below.

Short-Term Construction Vibration Impacts

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of a construction site respond to these vibrations with varying results, ranging from no perceptible effects at the low levels, to slight damage at the highest levels. Table 3.9-3 gives approximate vibration levels for particular construction activities. The data in Table 3.9-3 provides a reasonable estimate for a wide range of soil conditions.

Out of the variety of equipment used during construction, large vibratory rollers that would be used in the paving phase of construction would produce the greatest groundborne vibration levels. While impact pile drivers generate higher groundborne vibration levels, they are not expected to be used as a construction method for this project because site soil conditions do not warrant such structural engineering. Large vibratory rollers produce groundborne vibration levels ranging up to 0.21 inch per second (in/sec) peak particle velocity (PPV) at 25 feet from the operating equipment. The nearest off-site receptor is the school land use on the west side of Coffee Street, approximately 100 feet from the nearest project construction footprint where heavy construction equipment would be operating. At that distance, groundborne vibration levels would attenuate to below 0.03 in/sec PPV from operation of a large vibratory roller at the nearest project construction footprint. This vibration level is well below the industry standard vibration damage criteria of 0.2 in/sec PPV for buildings of this type of construction (see Table 3.9-6). Therefore, construction-related groundborne vibration impacts would be less than significant.

Operational Vibration Impacts

Implementation of the project is not expected to include any permanent sources that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any existing sensitive land use in the project vicinity. In addition, there are no existing significant permanent sources of groundborne vibration in the project vicinity to which the project would be exposed. Therefore, project operational groundborne vibration impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance Before Mitigation

Less than significant impact.

Permanent Increase in Ambient Noise Levels

Impact NOI-3:	**The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.**

Impact Analysis

Significant noise impacts to off-site receptors would occur if the project would result in a substantial increase in ambient noise levels, compared with noise levels existing without the project. A change of 3 dB is the lowest change that can be perceptible to the human ear in outdoor environments, while a change of 5 dBA is considered the minimum readily perceptible change to the human ear in outdoor environments. Therefore, for purposes of this analysis, an increase of 5 dBA or greater in ambient noise levels, or an increase that would result in an exceedance of the City's maximum allowable noise exposure standards, would be considered a potential substantial increase.

Project-related traffic and stationary noise source impacts are each discussed separately below.

Traffic Noise Impacts to Off-Site Receptors

Based on the traffic noise modeling results summarized in Table 3.9-9, the only roadway segment that would experience a substantial (5 dBA or greater) increase in traffic noise levels with implementation of the project is the segment of Coffee Street from Campus Parkway to Mission Avenue.

As shown in Table 3.9-9, the segment of Coffee Street from Campus Parkway to Mission Avenue, under EPAP plus project conditions, would experience traffic noise levels ranging up to 63.3 dBA CNEL, an increase of 5.1 dBA compared with conditions that would exist without the project. However, there are no existing receptors along this roadway segment, and therefore this increase in traffic noise levels would not be considered significant.

It should be noted that, as shown in Table 3.9-9, some modeled roadway segments would actually experience a slight decrease in traffic noise levels with implementation of the project compared with noise levels that would exist without the project. This is due to trip diversion that would occur with implementation of the project.

Stationary Source Noise Impacts to Off-Site Receptors

Implementation of the project will include new noise sources such as truck delivery, loading/unloading activities at the commercial loading areas, parking lot activities such as people conversing, doors slamming, engine startup, and slow-moving vehicles, as well as new exterior mechanical equipment noise sources, such as rooftop ventilation systems on proposed commercial land uses.

As noted in the Impact NOI-1 discussion, noise levels from project stationary noise sources would result in maximum noise levels of up to 69.5 dBA L_{max} with a maximum hourly average of 44.5 dBA L_{eq} as measured at any nearest sensitive receptor. When averaged over a 24-hour period, these

noise levels would be well below the traffic noise levels that are currently experienced along all surrounding roadway segments in the project vicinity, as shown in Table 3.9-9. Therefore, long-term operational noise associated with implementation of the project would not result in a substantial permanent increase in ambient noise levels, and impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Temporary or Periodic Increase in Ambient Noise Levels

Impact NOI-4:	**The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.**

Impact Analysis

Construction noise impacts were analyzed in the Impact NOI-1 discussion above. As discussed previously, project-related construction noise levels at the closest noise-sensitive land use to the project site could range up to approximately 84 dBA L_{max}. The closest noise-sensitive land use is the school land use on the west side of Coffee Street. Overall average daily project construction noise levels would be much lower than this worst-case scenario, as all equipment would not always operate simultaneously, and would also be lower as the equipment operates toward the center of the project site further from off-site receptors. Therefore, although there would be a relatively high single event noise exposure potential causing intermittent noise nuisance, the effect on longer-term (hourly or daily) ambient noise levels would be small. In addition, compliance with the stated restrictions on permissible hours of construction, as well as implementation of best management noise reduction measures as outlined in Mitigation Measure NOI-1, would ensure that construction noise would not result in a substantial temporary increase in ambient noise levels as measured at sensitive receptors in the project vicinity.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measure NOI-1.

Level of Significance After Mitigation

Less than significant impact.

3.10 - Public Services and Utilities

3.10.1 - Introduction

This section describes the existing public services and utilities and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information provided by the City of Merced and the Merced Fire Department.

3.10.2 - Environmental Setting

Fire Protection and Emergency Medical Services

The Merced Fire Department provides fire protection, rescue, and emergency medical services from five stations totaling 23.32 square miles in the City of Merced. The Fire Department is headquartered at Station 51 located near the intersection of East 16th Street and G Streets.

Stations

The Fire Department Headquarters (Station 51) is located 2.9 miles from the project site and will gain access to the site using State Route 99 (SR-99) and Campus Parkway. There are four other stations in the Merced Fire Department: Station 52 is located at the Merced Regional Airport on Falcon Way; Station 53 is on Loughborough Drive adjacent to the Merced Mall; Station 54 is on E. 21st Street; and Station 55 is at the intersection of Parsons and Silverado Avenues within the Bob Carpenter Park (Merced Vision 2030 General Plan 2012).

The Merced Gateway Project includes a possible Fire Station Parcel that will improve existing and future fire-response times to this area of the City. It will have quick access to the site area and SR-99 for emergency services.

Apparatus

The Fire Department's apparatus and equipment consists of the following (Merced Fire Department 2015):

- Five engines
- One Office of Emergency Services engine
- One aerial ladder truck
- One decontamination trailer
- One rescue trailer
- One public education trailer
- One airport response firefighting vehicle
- One rehabilitation squad
- Three reserve engines and one reserve ladder truck

Staffing

There are 65 full-time fire personnel employees including one Fire Chief, one Fire Deputy Chief, three Battalion Chiefs, 57 line personnel, one Fire Inspector, and two secretaries. Personnel are typically

assigned to a three-shift, 48-hour work schedule starting at 8:00 a.m. and ending at 8:00 a.m. that provides 24 hours of coverage 7 days a week (Merced Fire Department 2015).

Response Times and Protocols

The Fire Department Facilities Master Plan establishes a goal of 4- to 6-minute response times for the first crew to arrive at the fire or medical emergency. The fire stations are strategically placed to provide a level of service that is specific to a given geographical area or district. This maintains a response time that meets the goals of the Fire Department. As the City grows, new fire protection measures will be established to provide an efficient fire protection system. This includes the relocation of facilities and establishment of new stations and personnel.

The Department is evaluated and rated by the Insurance Services Organization (ISO). The ISO issues a Fire Protection Rating System Score of 1 to 10, of which 1 is the best level of protection. Merced's Fire Department currently has an ISO score of 2, which is above the average compared to other cities. This score helps to determine insurance premiums for both commercial and residential uses throughout the City (Merced Vision 2030 General Plan 2012).

Calls for Service

The call volume for the Fire Department rises annually as result of a larger population base and other factors associated with access to services and socioeconomic factors. In 2010, the Department responded to 6,325 incidents: 6 percent of which were to fires and 57 percent to emergency and medical services. The remaining 37 percent of responses are comprised of a variety of other types of incidents (Merced Vision 2030 General Plan 2012).

Police Protection

Police protection for the City of Merced is provided by the Merced Police Department. The Police Department is divided into three districts:

- District 1 serves areas north of Bear Creek from the North Station on Loughborough Drive;
- District 2 serves the areas between SR-99 and Bear Creek from the Central Station at M and 22 Streets; and
- District 3 serves the area south of SR-99 from the South Station on W. 11th Street in McNamara Park.

The division of coverage by the Merced Police Department allows officers to be stationed closer to the neighborhoods they enforce. By doing so, police officers and citizens develop "community policing" that will be successful in combatting future crime incidences (Merced Vision 2030 General Plan 2012).

Unincorporated areas within the City of Merced sphere of influence fall under the Merced County Sheriff's Department. The Department is located at 700 West 22nd Street and employs over 80 sworn deputies to provide protection for the unincorporated areas of the County.

Organization and Staffing

The Merced Police Department employs sworn officers, non-sworn officers, and unpaid volunteers. The Department planned for a ratio of 1.32 sworn officers per 1,000 citizens in 1995. According to the Merced Vision 2030 General Plan, in 2010 there were 111 sworn officers with a city population of 80,985, which exceeds the standard of one sworn officer per 1,000 citizens (Merced Vision 2030 General Plan 2012).

Because of an increase in population, criminal activity and calls for police services will rise accordingly. Officer response incidents could realistically increase to over 130,000 annually by 2030 based on projected population growth. Police officers, equipment, and facilities will be added to accommodate for the necessary increase in police protection.

Response Times

The Merced Police Department places each call within a group ranging from priority 1 calls to priority 3 calls. Priority 1 calls are the most urgent, while priority 3 calls are non-emergency incidents. Currently, 67 percent of priority 1 calls have a response time of less than 5 minutes, while 56 percent of all priority calls have a response time of less than 5 minutes. This statistic is derived from the time it takes dispatch to send an officer to when they arrive at the scene (Merced Police Department 2016).

Potable Water

The Merced Irrigation District (MID) controls the water rights for Merced and delivers water from the Merced River via Lake Yosemite. The City relies mostly on water pulled from the deep aquifer, which is in a current state of overdraft. The surface water recharge from the Merced River affects a shallow aquifer; however, that is not the source of water for the City of Merced (Merced Vision 2030 General Plan 2012).

The Merced Water Supply Plan evaluates future water needs related to urban water growth, primarily due to population increase. The Merced Water Supply Plan identifies five goals:

- Manage groundwater resources.
- Provide a high-quality, reliable supply of water for cities.
- Protect and enhance the economic base.
- Protect MID's Merced River water rights.
- Maintain consensus on a water supply plan.

The plan has been updated since its adoption in 1995 to adapt to new conditions that could affect these long-term goals (Water Consumer Confidence Report 2014).

In 2010, the City adopted an Urban Water Management Plan (UWMP) that aimed to identify conservation practices to preserve groundwater levels and achieve a water conservation target of 20 percent by 2020. The UWMP ensures that future needs of citizens and business are met by using unit water factors to determine water needs based on housing, commercial, and population projection.

The 2010 plan is based on multiple supporting plans and agencies including Merced Area Groundwater Pool Interests (MAGPI), the previous 2005 Groundwater Management Plan, Merced Water Supply Plan Update, and the Merced Groundwater Basin Management Plan. The 2010 UWMP provides historical information mixed with projected future data to describe the water system's description, demands, and supplies. Water supply shortage and demand management measures are included to plan for normal and dry years (Merced UWMP 2010).

Recycled Water

In 2014, the Wastewater Treatment Facility (WWTF) produced 742 million gallons of recycled water used for irrigation and 475 million gallons of recycled water that was discharged into wetland habitats (Water Consumer Confidence Report 2014). In 2015, Merced received state approval to use recycled water for irrigation of the urban landscape including trees and plants within the City. This maintains the life of trees and plants while adhering to California State policy of reducing overall water usage (City of Merced 2015).

Although recycling water is a part of Merced's conservation effort, the City of Merced focuses the majority of its conservation efforts on prevention by reducing water use. This includes the implementation of high efficiency uses of water, landscape audit programs designed to examine the costs and benefits of reduced demand for potable water, and system-wide water audits and meters. The City of Merced takes many precautionary measures to limit the use of water in order to achieve high efficiency use of both potable and recycled water (Merced UWMP 2010).

The newly built facilities will pursue water-efficiency technologies in order to manage their water use effectively.

Wastewater

The City of Merced provides wastewater collection and treatment for the Merced urban area. The WWTP, located 2 miles south of the Airport, is regularly expanded in order to serve the needs of the growing population and industries (Merced Vision 2030 General Plan 2012).

Wastewater throughout the City travels through 260 miles of sewer pipes and 22 lift stations to arrive at the WWTP. The WWTP, one of the most sophisticated facilities in the state, treats up to 12 million gallons of water per day. Treated wastewater is then redistributed from the WWTP for either irrigation purposes or wildland refuge (Water Consumer Confidence Report 2014).

Storm Drainage

The City requires construction of stormwater percolation/detention basins for new developments. The City's Flood Damage Prevention Ordinance restricts developments in flood-plain areas unless special construction requirements have been met. All developments must be based on the required 100-year event flood-plain requirements.

The City of Merced adopted a Storm Water Management Program (SWMP) to limit the discharge of pollutants into the storm sewer system. The SWMP has six control measures that will result in significant reductions in the number of pollutants entering water bodies:

- Public Education and Outreach on Storm Water Impacts Program
- Public Involvement/Participation Program
- Illicit Discharge Detection and Elimination Program
- Construction Site Storm Water Runoff Control Program
- Post-Construction Storm Water Management in New Development and Redevelopment Program
- Pollution Prevention/Good Housekeeping for Municipal Operations Program

The Master Plan for the Project indicates multiple potential bioswales with catch basin filters that would drain into the existing county terminal drainage basin (Merced Gateway Master Plan 2015).

Solid Waste

The County of Merced is the contracting agency for all landfill operation and maintenance. There are two landfills owned and operated by the Merced County Regional Waste Management Authority. The Highway 59 Landfill serves the eastern end of the County, and the Billy Wright Landfill serves the western end. It is estimated that the Highway 59 Landfill, which will serve the project, has adequate capacity until 2030. The City of Merced provides services for refuse pick up including green waste, recycling, and street sweeping services (City of Merced 2015).

The Merced County Integrated Waste Management Plan (IWMP) requires recycling programs, which is expected to decrease landfill waste by 50 percent and extend the use of the two landfills. Along with landfill diversion, each landfill has resource recovery areas and a composting facility that provides collection service for green wastes. All loads brought to the landfill are inspected to ensure that recyclable materials are sent to the correct facilities (City of Merced 2015).

Energy

Pacific Gas & Electric (PG&E) is the primary electricity and natural gas provider to the northern and central parts of California, including the City of Merced.

Electricity

PG&E, which is regulated by the California Public Utilities Commission (CPUC) provides electricity to all or part of the 47 counties in California, including Merced County. PG&E charges connection and user fees for all new development, and sliding use-based rates for electrical and natural gas service. In 2014, PG&E obtained 35.8 percent of electricity from its own generation sources and the remaining 64.2 percent from outside sources. PG&E-owned generating facilities include nuclear, natural gas, and hydroelectric, with a net generating capacity of more than 7,684 megawatts. Outside suppliers to PG&E include the California Department of Water Resources, irrigation districts, renewable energy suppliers, and other fossil fuel-fired suppliers. PG&E operates approximately 141,700 circuit miles of transmission and distribution lines. PG&E is interconnected with electric power systems in the western Electricity Coordinating Council, which includes 14 western states; Alberta and British Columbia, Canada; and parts of Mexico. In 2014, PG&E delivered 86,303 gigawatt-hours of electricity to its 5.3 million electrical customers.

Natural Gas

PG&E provides natural gas to all or part of 39 counties in California comprising most of the northern and central portions of the State, including Merced County. PG&E obtains its natural gas supplies from western North America, including basins in western Canada, the Rocky Mountains, the southwestern United States, and California. PG&E operates approximately 49,100 miles of transmission and distribution pipelines, and three underground storage fields with a combined storage capacity of 48.7 billion cubic feet (Bcf). In 2014, PG&E delivered 269 Bcf of natural gas to its 4.4 million natural gas customers.

In 2009, the City accepted Energy Efficiency and Conservation Block Grant funds from the Department of Energy to implement projects to increase energy efficiency. One of the main projects included drafting a Climate Action Plan (CAP)—a community-based policy that establishes a goal to reduce emissions through enhancing conservation efforts, improving energy efficiency throughout the City, and building an efficient and healthy community (City of Merced 2015).

The City identifies two policies within the Merced Vision 2030 General Plan aimed at maximizing sustainable energy resource use in Merced:

- Promote the use of solar energy technology and other alternative energy sources.
- Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

The City aims to work with members of building and utility companies to construct a set of standards that can be used to design new building and development projects that utilize renewable resources. The City also suggests developers to maximize “passive” solar design that takes advantage of solar energy opportunities. This includes south-facing windows for winter heat gains and overhangs and shading for summer heat protection. Voluntary incentive programs can also offer opportunities for providers to utilize energy conservation features within new building designs and equipment.

3.10.3 - Regulatory Framework

State

California Fire Code and California Building Code

The International Fire Code and the International Building Code, established by the International Code Council (ICC) and amended by the State of California, prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection.

California Building Standards Code

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, is a compilation of three types of building standards from three different origins:

- Building standards that have been adopted by state agencies without change from building standards contained in national and international model codes.
- Building standards that have been adopted and adapted from the national and international model code standards to meet California conditions.

- Building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

California Occupational Safety and Health Administration

In accordance with California Code of Regulations, Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment," the California Occupational Safety and Health Administration (Cal OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include but are not limited to guidelines on the handling of highly combustible materials, fire hosing sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

California Health and Safety Code

State fire regulations are set forth in Sections 13000, et seq. of the California Health and Safety Code, which includes regulations for building standards (as set forth in the California Building Code), fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, childcare facility standards, and fire suppression training.

California Urban Water Management Planning Act

The Urban Water Management Planning Act (California Water Code Sections 10610-10656) requires that all urban water suppliers with at least 3,000 customers prepare urban water management plans and update them every 5 years. The act requires that urban water management plans include a description of water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions. Specifically, urban water management plans must:

- Provide current and projected population, climate, and other demographic factors affecting the supplier's water management planning;
- Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier;
- Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage;
- Describe plans to supplement or replace that source with alternative sources or water demand management measures;
- Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis (associated with systems that use surface water);
- Quantify past and current water use;
- Provide a description of the supplier's water demand management measures, including schedule of implementation, program to measure effectiveness of measures, and anticipated water demand reductions associated with the measures; and
- Assessment of the water supply reliability.

Model Water Efficient Landscape Ordinance

The Model Water Efficient Landscape Ordinance was adopted by the Office of Administrative Law in September 2009, and requires local agencies to implement water efficiency measures as part of its review of landscaping plans. Local agencies can either adopt the Model Water Efficient Landscape Ordinance or incorporate provisions of the ordinance into its own code requirements for landscaping. For new landscaping projects of 2,500 square feet or more that require a discretionary or ministerial approval, the applicant is required to submit a detailed "Landscape Documentation Package" that discusses water efficiency, soil management, and landscape design elements.

California Public Utilities Commission

The CPUC regulates privately owned telecommunication, electric, natural gas, water, railroad, rail transit, and passenger transportation companies. It is the responsibility of the CPUC to (1) assure California utility customers safe, reliable utility service at reasonable rates; (2) protect utility customers from fraud; and (3) promote a healthy California economy. The Public Utilities Code, adopted by the legislature, defines the jurisdiction of the CPUC.

California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of by transformation and land disposal, the State Legislature passed Assembly Bill (AB) 939, the California Integrated Waste Management Act of 1989, effective January 1990. The legislation required each local jurisdiction in the State to set diversion requirements of 25 percent by 1995 and 50 percent by 2000; established a comprehensive statewide system of permitting, inspections, enforcement, and maintenance for solid waste facilities; and authorized local jurisdictions to impose fees based on the types or amounts of solid waste generated. In 2007, Senate Bill (SB) 1016, Wiggins, Chapter 343, Statutes of 2008, introduced a new per capita disposal and goal measurement system that moves the emphasis from an estimated diversion measurement number to using an actual disposal measurement number as a per capita disposal rate factor. As such, the new disposal-based indicator (pounds per person per year) uses only two factors: (1) a jurisdiction's population (or in some cases employment): and (2) its disposal as reported by disposal facilities.

Title 24, California's Energy Efficiency Standards for Residential and Nonresidential Buildings

Title 24, Part 6, of the California Code of Regulations establishes California's Energy Efficiency Standards for Residential and Nonresidential Buildings. The standards were updated in 2013. The 2013 standards set a goal of reducing growth in electricity use by 561.2 gigawatt-hours per year (GWh/y) and growth in natural gas use by 19 million therms per year. The savings attributable to new nonresidential buildings are 151.2 GWh/y of electricity savings and 3.3 million therms. For nonresidential buildings, the standards establish minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., heating, ventilation, and air conditioning [HVAC]; and water heating systems), indoor and outdoor lighting, and illuminated signs.

California Water Code Sections 10910-10915

California Water Code Sections 10910 through 10915 requires that a Water Supply Assessment (WSA) be prepared for any Project meeting one or more of the following characteristics:

- A residential development of more than 500 dwelling units;
- A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
- A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
- A proposed hotel or motel, or both, having more than 500 rooms;
- An industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
- A mixed-use Project that includes one or more of the Projects specified above; and
- A Project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit Project.

The WSA must evaluate a project's anticipated water demands and determine if the local water supplier has adequate supplies to serve the project and meet existing and projected obligations.

Local

City of Merced

General Plan

The City of Merced General Plan sets forth the following goals, policies, and programs that are relevant to public services and utilities:

Public Facilities and Services

- **Goal:** Maintenance and Improvement of Merced's Existing Infrastructure
- **Policy P-1.1:** Provide adequate public infrastructure and municipal services to meet the needs of future development.
- **Action 1.1.a:** Through development review and long range planning efforts, ensure that utilities are adequately sized to accommodate the proposed development and, if applicable, allow for extensions for future developments, consistent with master plans.
- **Action 1.1.d:** Construct the storm water drainage, water and sewer systems in accordance with adopted master plans.
- **Goal:** New development which includes a full complement of infrastructure and municipal public facilities.
- **Policy 1.3:** Require new development to provide or pay for its fair share of municipal public facility and infrastructure improvements.
- **Action 1.3.a:** Prepare and adopt adequate fee schedules commensurate with the cost of planned improvements and services, with annual review and update.
- **Action 1.3.c:** All new development shall contribute its fair share of the cost of on-site and off-site public infrastructure and municipal services as appropriate.
- **Action 1.3.d:** The City may require developments to install off-site facilities, which also benefit other properties.

- **Action 1.3.e:** Master Plans, Community Plans, General Plan amendments, pre-zoning, and annexation proposals, through the Development Agreement process, shall ensure that infrastructure development and public facilities and municipal services are consistent with overall local public agency plans, and that the local public agencies can reasonably provide and/or extend services within the proposed development time frame of implementation.
- **Goal:** Maximum crime and fire protection services
- **Policy 2.1:** Maintain and enhance public protection facilities, equipment, and personnel to the maximum extent feasible within the resource constraints of the City to serve the City's needs.
- **Action 2.1.a:** Periodically review existing and potential station facilities, equipment and staffing levels in light of protection service needs.
- **Action 2.1.b:** Determine that new development is adequately served by fire and police protection services.
- **Action 2.1.c:** Fire station sites should be selected based on the distribution of land uses and population projected when the area is fully developed.
- **Action 2.1.d:** Ease of access should be a primary consideration in selecting a fire station site.
- **Action 2.1.h:** Assure that new development utilizes modern public protection concepts in their design and development.
- **Goal:** An adequate storm drainage collection and disposal system in Merced.
- **Policy 5.1:** Provide effective storm drainage facilities for future development.
- **Action 5.1.a:** Continue to implement, the City's Storm Water Master Plan and the Storm Water Management Plan and its control measures.
- **Action 5.1.b:** Work with the Merced Irrigation District (MID) and the County to update the City's Storm Water Master Plan to account for changes in expected storm drainage runoff due to expanded land uses within the Merced area.
- **Action 5.1.c:** Continue to require all development to comply with the Storm Water Master Plan and any subsequent updates.
- **Action 5.1.d:** Installation or design of facilities necessary to provide services to development projects will be based on the full build-out scenario.
- **Policy 5.2:** Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.
- **Action 5.2.a:** Provide drainage channels in transportation or canal easement areas to the extent feasible.
- **Action 5.2.b:** Storm water facilities shall be designed and constructed in accordance with the standards in the Parks and Open Space Master Plan and the Storm Water Master Plan.
- **Goal:** Solid waste management services that accommodate the local population without causing significant damage to environmental resources.
- **Policy 6.2:** Minimize the potential impacts of waste collection, transportation and disposal facilities upon the residents of Merced.
- **Action 6.2.b:** Cooperate with Merced County Regional Waste Management Authority to implement recommendations for source reduction programs which have the least environmental and economic impacts on the City and its residents.
- **Goal:** Sustainable energy resource use in the City of Merced.
- **Policy SD-3.1:** Promote the use of solar energy technology and other alternative energy resources.

- **Policy SD-3.2:** Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

3.10.4 - Methodology

FCS reviewed information about public services and utilities providers in the project vicinity. The City of Merced General Plan and agency websites were reviewed for relevant information. In addition, FCS reviewed the website for the Merced Fire Department for information about current staffing and response times, and interviewed police department and WWTP personnel regarding current response times and capacity.

3.10.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, public services and utilities impacts resulting from the implementation of the proposed project would be considered significant if the project would:

> . . . 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:
>
> a) Fire Protection?
> b) Police Protection?
> c) Schools? (Refer to Section 7, Effects Found not to be Significant.)
> d) Parks? (Refer to Section 7, Effects Found not to be Significant.)
> e) Other public facilities? (Refer to Section 7, Effects Found not to be Significant.)

To determine whether impacts to utilities and services are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?
- 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?

- Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?
- Comply with federal, state, and local statutes and regulations related to solid waste?
- Result in inefficient, wasteful, or unnecessary consumption of energy?

3.10.6 - Project Impacts and Mitigation Measures

Fire Protection and Emergency Medical Services

Impact PSU-1:	**Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded fire facilities or adverse impacts on fire protection.**

Impact Analysis

The Merced Fire Department provides fire protection and emergency medical services to the Master Plan area.

The Master Plan includes a maximum of 178 multi-family residential units and up to 601,127 square feet of commercial uses. The increase of residential population and commercial uses will require an increase in fire protection and emergency services. According to the Merced Fire Department 2014 Annual Report, the department reported general response times of 4 minutes and 55 seconds, which meets the goal of first response in 4 to 6 minutes as established in the Fire Department Facilities Master Plan. The proposed project would not cause response times to increase to unacceptable levels.

The Master Plan represents planned growth as stated in the Urban Expansion chapter in Merced's General Plan. An implementing action states the City will adequately plan for public improvements/services, including fire protection, to support designated land uses for all areas as they become suitable for development (Merced Vision 2030 General Plan 2015). The City will expand fire protection personnel and facilities as needed to support the growing population.

Development impact fees imposed on the project will help to remodel and construct new fire protection services. Fees, updated January 1, 2016, amounting to $7,283 per 1,000 square feet for commercial uses and $3,332 per dwelling unit for residential uses would be applied to the project, totaling $4,970,179. As the City grows, these fees, subject to annual increases, will fund needed public facilities and infrastructure.

Along with expected growth of fire protection personnel and facilities, the Master Plan includes a proposed site for a future fire station that will serve the area.

The proposed Master Plan shows a 9,000-square-foot Fire Station Parcel located in the north site adjacent to Gerard Avenue. This location, combined with the future development of a station, will provide fire protection and emergency service to the site area, and has access to SR-99 for quick response to other areas located near the Master Plan area.

The proposed project would not create a need for an expansion of any existing fire protection facilities, as it will provide a site for an addition of a new fire station within the Master Plan Area. This Draft EIR is a program-level document, and future construction of the fire station will be subject to further CEQA review as required by the City of Merced. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Police Protection

Impact PSU-2:	**Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded police facilities that result in physical impacts on the environment, insufficient response time, or overall police protection.**

Impact Analysis

The Merced Police Department provides police protection services to the Master Plan area. The Central Station located at 611 W. 22nd Street will serve the Master Plan Area. The location is approximately 5.3 miles from the site area and will have access to the area using SR-99.

The addition of 178 multi-family units and 601,127 square feet of commercial uses would result in an increase in calls for service. These additional calls for service will impact response times and other police services.

The Merced Police Department places each call within a group ranging from priority 1 calls to priority 3 calls. Priority 1 calls are the most urgent, while priority 3 calls are non-emergency incidents. Currently, 67 percent of priority 1 calls have a response time of less than 5 minutes, while 56 percent of all priority calls have a response time of less than 5 minutes. This statistic is derived from the time it takes dispatch to send an officer to when the officer arrive at the scene. These response times meet accepted standards, and the Police Department reported that the proposed project would not cause response times to increase to unacceptable levels (Merced Police Department 2016).

The Merced General Plan projects Merced's population to grow to over 154,000 by 2030. The General Plan provides an Urban Expansion chapter that establishes an implementing action to adequately plan for public improvements/services to support designated land uses for all areas as they become suitable for development. This includes revising master plans to provide municipal services for all new growth areas (Merced Vision 2030 General Plan 2015). The proposed project is within the growth projections the City has provided and police services will grow as the City's sphere of influence grows. Development impact fees imposed on the project will help to remodel and construct new police protection services. Fees, updated January 1, 2016, amounting to $7,283 per

1,000 square feet for commercial uses and $3,332 per dwelling unit for residential uses would be applied to the project, totaling $4,970,179. As the City grows, these fees, subject to annual increases, will fund needed public facilities and infrastructure.

The planned growth of police services in coordination with urban expansion along with unaffected response times indicate impacts on police services would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Potable Water

Impact PSU-3:	**Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded potable water facilities that result in physical impacts on the environment.**

Impact Analysis

The main supply of potable water for the City of Merced is from groundwater supply from the underlying Merced subbasin; therefore, this analysis focuses on the project's potential to deplete groundwater in evaluating the potential need for new or expanded potable water facilities.

As discussed in the WSA prepared by Balance Hydraulics (Appendix H), the City of Merced relies almost exclusively on local groundwater from the Merced Subbasin to supply its customers. The City maintains 19 wells throughout its service area with rated capacities between 1,200 and 4,000 gallons per minute.

The Merced Subbasin is listed as a "critically overdrafted" groundwater basin by the State. The subbasin has experienced a more than 60-foot decrease in groundwater levels since 1970. Although groundwater levels have decreased, the City of Merced's ability to pump from the subbasin has not been adversely affected. Moreover, the City and the Merced Irrigation District have implemented groundwater management efforts since 1997 to slow the decline of overdraft including direct recharge and in-lieu recharge. In 2008, both agencies adopted a Groundwater Management Plan for the subbasin that sets forth strategies to optimize use of the groundwater resource to eliminate the overdraft.

The WSA prepared by Balance Hydrologics estimated project water demand to be 150 acre-feet per year at buildout. For comparison purposes, "worst case" total demand for the City of Merced municipal water system service area is estimated to range from 39,977 acre-feet per year in 2020 to 54,649 acre-feet per year in 2030. Thus, the proposed project's demand would represent 0.3 to 0.4 percent of total citywide demand. The WSA indicated that adequate potable water supplies are

expected to be available under all water year scenarios, taking into account the water demands of the proposed project.

The uses associated with the proposed project were accounted for by the Merced Vision 2030 General Plan, which currently designates the project site as "Medium to High Density Residential" and "Regional Community Commercial." Although the proposed project would change the acreage allocations of these designations (increasing the amount of commercial acreage by 12 acres and reducing the amount of residential acreage by approximately 12 acres), the Master Plan would include a 178-unit, multi-family residential complex (21 units per acre), which results in a total number of units consistent with the anticipated unit count in the General Plan. In summary, the project site was contemplated for this type of development by the General Plan, and, therefore, the future number of water service connections and future potable water usage was indirectly accounted for by the General Plan and UWMP.

Moreover, the WSA noted that the City of Merced experienced a net decrease in water demand in 2014 and 2015 in response to the mandatory water use reduction measures issued by the State. This serves to demonstrate that the City has the ability to manage its municipal water supply such that it can provide adequate water supplies in periods of extended drought.

Finally, the proposed project would be required to use metered connections, comply with the City water efficiency requirements for landscaping, and any temporary or permanent mandatory water conservation measures that are in effect. All of these requirements would serve to reduce potable water demand.

Although the Merced Subbasin is in a state of overdraft, the overdraft in itself is not a limitation on the City's ability to draw water from the aquifer. Additionally, the project would implement measures to reduce demand for potable water. Lastly, the City and Merced Irrigation District are proactively managing the subbasin to reverse the overdraft trend and the project is consistent with those efforts. Therefore, impacts related to the need for new or expanded potable water facilities would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Recycled Water

Impact PSU-4: **Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded recycled water facilities that result in physical impacts on the environment.**

Impact Analysis

The City does not rely on recycled water as a regular source of water and does not have the capability or infrastructure to use it for widespread irrigation. The recycled water that is used is collected from the WWTP for limited agricultural use and wildland management. In response to the recent drought years, the City has begun to use its treated water for irrigation for public parks.

The Master Plan involves the use of drought-tolerant landscaping design to limit water use throughout the site area. Climate-appropriate, drought-tolerant species are required, and ornamental and specialty plant materials may supplement the drought-tolerant plant palette. A water budget will be developed to conform to Merced's local water landscape ordinance or with the California Department of Resources Model Water Efficient Landscape Ordinance, whichever is more stringent. The use of permeable paving will help to reduce runoff and replenish water supply within the site area (Merced Gateway Application 2015).

Overall, the Master Plan will use water-restricting methods in order to reduce the use of potable water wherever possible. This will limit the need for recycled water, and impacts will be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Wastewater

Impact PSU-5: **Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded wastewater facilities that result in physical impacts on the environment.**

Impact Analysis

The City's WWTP is located in the southwest part of Merced near the airport. The WWTP provides treatment for all wastewater throughout the City. Throughout the years, the WWTP has undergone many additions of equipment and facilities in order to provide service for the growing City of Merced. The City initiated an expansion plan for the WWTP in 2006 that will ultimately double the capacity from 10 million gallons per day (mgd) to 20 mgd by 2030. The City elected to construct initial expansion to 12 mgd, which coincides with the relatively slow near-term growth of the City.

Expansions after this will occur at 4 mgd increments, and the WWTP will be able to support the expected wastewater volume of 19.35 mgd by 2025 (Merced WWTP EIR 2006).

Treated water is disposed of in several ways. Seventy-five percent of the water is discharged into Hartley Slough, a tributary to the San Joaquin River. The rest of the water is used for land application throughout City-owned wetland and agricultural areas. The City negotiated with the MID for an exchange of surface water for effluent from the WWTP. This benefits the City by using exchange surface water for irrigation uses allowing for more conservation of the depleted groundwater basin.

Wastewater generated by the proposed uses in the Master Plan area will be treated by the WWTP. Based on a factor of 90 percent of potable water usage, the wastewater expected to be produced by the site would equal 12,052 gallons per day, less than 1 percent of the plant's current capacity of 12 mgd. According to the WWTP, only about 6.5 to 7 mgd are being treated by the plant per day; therefore, there is immediate capacity for the project's wastewater. Discharge of wastewater from the proposed project will not exceed the current or future capacity of the WWTP, and, physical impacts will be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Storm Drainage

Impact PSU-6:	**Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded storm drainage facilities that result in physical impacts on the environment.**

Impact Analysis

The project site is located within the Doane Lateral Canal watershed. The canal parallels the west side of Campus Parkway before entering a culvert under the roadway and continuing south in an open channel to Miles Creek. There are currently no municipal storm drainage facilities within the project site. Runoff from the project site either ponds on-site or sheet flows to the canal.

The City of Merced Storm Drainage Master Plan contemplates a future storm drainage line that would run along the eastern boundary of the project site in a north-south direction. The storm drainage line would begin as a 36-inch-diameter pipeline on the north side of Campus Parkway, upsize to a 54-inch-diameter pipe south of the parkway, and finally upsize to a 60-inch-diameter pipe at Mission Avenue before discharging to an existing stormwater basin at the Doane Lateral Canal crossing of Mission Avenue.

In lieu of constructing the storm drainage facilities contemplated by the Storm Drainage Master Plan, the project applicant is proposing to develop a storm drainage system that would convey runoff to an off-site stormwater basin located at the intersection of Mission Avenue/Coffee Street. This basin is owned and maintained by the County of Merced and was developed in conjunction with the SR-99/Campus Parkway interchange.

The preliminary stormwater runoff analysis shows 615,855 cubic feet of runoff volume that will be conveyed through drainage bioswales into inlets that will be equipped with catch basin filters and piped to the existing basin. Pursuant to the County's drainage design standards, the applicant would be required to excavate the basin to increase capacity to meet the design standard of accommodating a 100-year storm plus 20 percent over capacity. This would be equivalent to 13.6 acre-feet. The City will require the project's drainage plan to meet performance standards so that the amount of water leaving the site will not exceed the capacity of the storm drain basin. These requirements are discussed further in Section 3.7, Hydrology. In addition, up to 20 bioswales equipped with catch basins will be included throughout the site to filter pollutants and limit runoff volume.

Collectively, these measures would serve to slow, reduce, and meter the volume of runoff leaving the project site and ensure that downstream storm drainage facilities are not inundated with project-related stormwater. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Solid Waste

Impact PSU-7:	**Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded solid waste facilities that result in physical impacts on the environment.**

Impact Analysis

The Merced County Regional Waste Management Authority controls solid waste. There are two landfills that serve Merced County: Billy Wright Road Landfill and Highway 59 Landfill. The Highway 59 landfill will serve the Master Plan area and is expected to have capacity until at least 2030. Required recycling programs help to reduce landfill use by 50 percent. Both landfills also have resource recovery areas that detect materials that should be sent to a composting facility. Each arriving load is inspected to ensure that recycling and compost waste arrives in the correct facility.

The Merced Refuse Division is responsible for all solid waste collection within the City. The Refuse Division will collect solid waste from the site area and dispose the waste at the Highway 59 landfill.

The overall design capacity of the Highway 59 landfill is currently 30,012,352 cubic yards, of which 24,000,000 cubic yards of unused capacity was available as of 2014. Currently, the peak tonnage per day allowed is 1,500 tons per day. Highway 59 Landfill reported that it accepts on average 900 tons per day with a capacity for 600 more tons per day. Normal population growth will cause the projected daily tonnage of waste to be handled by the landfill to grow incrementally through 2035. The City has initiated an expansion project that will modify the current Solid Waste Facility Permit to increase the monthly average tonnage per day to 1,400 tons and the peak tonnage per day to 2,000 tons. Further expansions of the landfill are expected in order to meet these growing needs.

The proposed project contains 659,188 square feet of residential uses and 601,127 square feet of commercial uses. The United States Environmental Protection Agency provides construction and operational waste generation rates. The non-residential construction rate is 3.89 pounds per square foot while the residential construction rate is 4.38 pounds per square foot. This would total approximately 2,612 tons of solid waste from project-related construction. This tonnage would be spread out over the length of the Master Plan buildout, and actual volumes of disposal would not be more than several tons at a time.

The operational rates are 0.1 pound per square foot per day for non-residential uses and 10 pounds per square foot per day for residential uses. The daily tonnage would total approximately 31 tons per day of solid waste, which is well within the available capacity of the Highway 59 Landfill. In addition, recycling and waste reduction policies will reduce this figure. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Energy

Impact PSU-8:	**Development and land use activities contemplated by the Master Plan would not result in a need for new or expanded energy facilities that result in physical impacts on the environment.**

Impact Analysis

The City of Merced plans to take multiple steps moving toward sustainable development as seen in the Merced Vision 2030 General Plan. Cooperation with other agencies such as the San Joaquin Valley Air Pollution Control District and private developers is intended to form a cohesive plan to support sustainable growth and energy use.

The Master Plan area is currently served with electricity and natural gas provided by PG&E. Using consumption figures provided by PG&E and the United States Energy Information Administration, the proposed project's estimated building electricity and natural gas consumption following project construction is summarized in Table 3.10-1.

Table 3.10-1: Electricity and Natural Gas Consumption

Use	Energy Source	Annual Consumption Rate	Count	Estimated Annual Consumption
Non-residential	Electricity	15.7 kWh/ square foot	601,127 square feet	9.5 million kWh
	Natural Gas	58.3 cubic feet/ square foot		35 million cubic feet
Residential	Electricity	5,961 kWh/ dwelling unit	178 dwelling units	1 million kWh
	Natural Gas	45,000 cubic feet/ dwelling unit		8 million cubic feet
Note: kWh = kilowatt-hour				

As shown in the table, the Master Plan uses would demand 10.5 million kilowatt-hours of electricity and 43.5 million cubic feet of natural gas at buildout. All new residential and non-residential development within the Master Plan boundaries would be subject to the latest adopted edition of the Title 24 energy efficiency standards, which are among the most stringent in the United States. As such, implementation of the Master Plan would not result in the unnecessary, wasteful, or inefficient use of energy.

According to the California Energy Commission, the total energy usage in Merced County in 2014 was 3,020 million kilowatt-hours (kWh). Although numbers for the City of Merced were not available, the County numbers still help to compare the energy needs that the project would create. Since the project will only create a need for a total of 10.5 million kWh per year, this is not a significant increase in energy consumption within the area. A total of 12.6 billion cubic feet of natural gas is used per year in Merced County. The increase of 43 million cubic feet of natural gas use estimated by the project will also not cause a significant increase in energy consumption within the Merced County area. PG&E should not have a problem providing electricity and natural gas to the area, and additional energy facilities to serve the area would be minimal.

Therefore, since the substantial addition of energy facilities is likely unnecessary to provide the site area with the energy needed for operation, impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

3.11 - Transportation

3.11.1 - Introduction

This section describes the existing transportation setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information provided by the Traffic Impact Analysis prepared by K.D. Anderson & Associates, Inc. The Traffic Impact Analysis is provided in Appendix I.

3.11.2 - Existing Conditions

Roadway Network

The following are summaries of the roadway network in the project vicinity. Exhibit 3.11-1 depicts the roadway network in the project vicinity.

State Route 99

State Route 99 (SR-99) is the primary north-south route through the eastern San Joaquin Valley and the major point of access to the City of Merced. SR-99 is generally a controlled access freeway with local connections limited to grade separated interchanges. SR-99 has four to six mainline travel lanes at various locations in Merced County. In the south Merced area of the project, relatively recent construction has provided a 6-lane facility at the Mission Avenue–Campus Parkway intersection. The speed limit on SR-99 is posted at 65 miles per hour (mph).

The most recent traffic volume counts published by Caltrans reveal an Annual Average Daily Traffic (AADT) volume of 40,000 vehicles per day in the area of the project. Trucks comprise roughly 27 percent of the daily traffic volume on SR-99 in this area.

Campus Parkway

Campus Parkway is a north-south expressway that is being incrementally constructed to link SR-99 in south Merced with Yosemite Avenue in the area of the University of California Merced campus. Currently, Campus Parkway extends from the SR-99/Mission Avenue interchange to its interim terminus at Childs Avenue. This portion of Campus Parkway is a 4-lane facility with a landscaped median. A multi-use pathway is located on the north side of the roadway. The posted speed limit on Campus Parkway is 55 mph.

Mission Avenue

Mission Avenue is an east-west street that traverses southern Merced. Mission Avenue begins at the SR-59/Dickenson Ferry Road intersection and continues easterly to its interchange on SR-99. East of the freeway Mission Avenue continues easterly from an intersection on Marino Way into rural Merced County. Mission Avenue is designated an Arterial Street in the General Plan Circulation Element. Today the portion of Mission Avenue adjoining the project is a two-lane undivided roadway with a speed limit of 55 mph.

Coffee Street

Coffee Street is a north-south Collector that extends from an intersection on Baker Drive south of SR-140 to Campus Parkway. However, the route is discontinuous as the portion of Coffee Street between Gerard Avenue and Parsons Avenue is closed to through traffic and only provides access to Pioneer Elementary School. Coffee Street is generally a two-lane street, but the segment from Campus Parkway to Parsons Avenue has a continuous two-way left turn lane. The segment of Coffee Street along the project frontage consists of a two-lane undivided roadway with curb, gutter, sidewalk, and street lighting on the west side of the roadway. The posted speed limit on Coffee Street is 35 mph.

Gerard Avenue

Gerard Avenue is an east-west Collector that extends across southern Merced but is bisected by SR-99. The eastern portion begins at an intersection on Parsons Avenue and continues to an intersection on Campus Parkway before reaching its eastern terminus near Planada. Gerard Avenue is a two-lane roadway with a posted speed limit of 45 mph, but a 25-mph school zone exists near Pioneer Elementary School. The segment of Gerard Avenue along the project frontage consists of a two-lane undivided roadway with curb, gutter, sidewalk, and street lighting on the north side of the roadway. The south side of the roadway is unimproved.

Marino Way

Marino Way is the southerly extension of Coffee Street beyond Mission Avenue. This two-lane street continues south along SR-99 to an intersection on Arboleda Drive near the Le Grand Road/SR-99 interchange.

Childs Avenue

Childs Avenue is an east-west Arterial that extends from an intersection on SR-59 across SR-99 to an eastern terminus near Planada. Childs Avenue is generally a two-lane road with a posted speed limit of 40 mph. Twenty-five-mph school zones exist on Childs Avenue in the vicinity of Weaver Middle School and near Golden Valley High School.

Parsons Avenue

Parsons Avenue is a north-south Collector-Arterial that links southern Merced with the downtown area. Today Parsons Avenue is discontinuous. The southern portion begins at an intersection on SR-140 and continues south along Golden Valley High School and across Childs Avenue before following SR-99 to an intersection on Coffee Street near the project. In the area of the project west of Coffee Street, Parsons Avenue is a divided four-lane road, and the route transitions to a two-lane facility west of its intersection with Alfarata Boulevard. The speed limit on Parsons Avenue is a posted at 45 mph.

Pluim Drive

Pluim Drive is a north-south Collector street in the residential neighborhood north of the project site. Under the General Plan, Pluim Drive will be extended southerly across Gerard Avenue to a signalized intersection on Campus Parkway and south to an intersection on Marino Way.

Source: KD Anderson & Associates, Inc. 2016

FirstCarbon SOLUTIONS

Exhibit 3.11-1
Project Vicinity and Study Intersections

THIS PAGE INTENTIONALLY LEFT BLANK

Level of Service

Level of Service (LOS) analysis provides a basis for describing existing traffic conditions and for evaluating the significance of project traffic impacts. Level of Service measures the quality of traffic flow and is represented by letter designations from A to F, with a grade of A referring to the best conditions, and F representing the worst conditions. The characteristics associated with the various LOS for intersections are presented in Table 3.11-1.

Table 3.11-1: Level of Service Criteria

Level of Service	Signalized Intersection	Unsignalized Intersection
A	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/vehicle
B	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/vehicle and ≤ 15 sec/vehicle
C	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/vehicle and ≤ 25 sec/vehicle
D	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/vehicle and ≤ 35 sec/vehicle
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/vehicle and ≤ 50 sec/vehicle
F	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/vehicle
Source: Transportation Research Board 2010.		

Intersection Level of Service Methodology

Intersection Level of Service was calculated for this traffic impact study using two methodologies.

Because current traffic volumes are low, existing conditions were evaluated using the methodology contained in the Highway Capacity Manual 2010 (Transportation Research Board 2010) using Synchro 8.0 software. HCM techniques generally treat each intersection as an isolated location, which is applicable today. In each case, HCM techniques identify the average length of delays and use that information to determine the operating Level of Service. An overall average delay and Level of Service is determined for intersections controlled by traffic signals or all-way stops. At locations controlled by side street stops, delays can be determined for each movement that must yield the right of way, and the "worst case" delay is employed for analysis.

Under future conditions traffic volumes will increase and a more sophisticated approach has been taken in order to account for the effects of intersection spacing. Simtraffic simulation was employed to identify the magnitude of delays occurring at each location, including assessment of the effects of spillover queuing to adjoining intersections. Simtraffic is a stochastic model, i.e. randomness is present when running simulations, and the results will vary within each scenario and between scenarios. The simulation results contained herein reflect the average of the mean ten 1-hour simulation runs selected from a 20-run sample. Each run employed a 10-minute seeding period.

Roadway Segment Level of Service Methodology

The Merced Vision 2030 General Plan presents daily traffic volume Level of Service thresholds that can be employed on a planning level basis; refer to General Plan Table 4.3. These thresholds are summarized in Table 3.11-2.

Table 3.11-2: Roadway Level of Service Criteria

Roadway Type	Daily Roadway Segment Level of Service Thresholds				
	LOS A	LOS B	LOS C	LOS D	LOS E
6-lane Freeway	25,900	42,600	57,800	68,400	76,000
4-lane Freeway	40,000	65,800	89,200	105,600	117,400
2-lane Expressway	—	—	16,800	23,200	24,400
4-lane Expressway	—	3,000	27,800	36,000	37,800
6-lane Expressway	—	5,900	38,900	48,900	51,300
2-lane Arterial	—	—	11,600	16,000	16,800
4-lane Arterial	—	4,100	26,800	33,700	35,400
2-lane Collector	—	—	4,800	10,300	13,200
4-lane Collector	—	—	11,300	22,200	26,400
Source: KD Anderson & Associates, Inc., 2016					

Study Intersections

The quality of traffic flow is typically governed by the operation of major intersections. Based on direction from City staff, thirteen existing intersections were analyzed for this traffic study. The locations of the study intersections are shown on Exhibit 3.11-1. The study area will also include another seven future project access intersections that do not exist today.

1. Childs Avenue/Parsons Avenue—Traffic Signal
2. Childs Avenue/Coffee Street—Traffic Signal
3. Gerard Avenue/Coffee Street—All-Way Stop
4. Gerard Avenue/Pluim Drive—SB Stop Sign
5. Gerard Avenue/Campus Parkway—Traffic Signal
6. Coffee Street/Pioneer ES North—EB Stop

7. Coffee Street/Pioneer ES Middle—EB Stop
8. Coffee Street/Pioneer ES South—EB Stop
9. Coffee Street/Parsons Avenue—All-Way Stop
10. Mission Avenue/SB SR-99 ramps—Traffic Signal
11. Mission Avenue/NB SR-99 ramps—Traffic Signal
12. Campus Parkway/Coffee Street—All-Way Stop
13. Coffee Street/Mission Avenue—WB Stop
14. Gerard Avenue/Project Access—NB Stop
15. Coffee Street/Central Access—WB Stop
16. Campus Parkway/Central Access—NB/SB Stop
17. Campus Parkway/Pluim Drive—NB/SB Stop
18. Coffee Street/South Access—WB Stop
19. Mission Avenue/Central Access—SB Stop
20. Mission Avenue/Pluim Drive—SB Stop

Childs Avenue/Parsons Avenue

The Childs Avenue/Parsons Avenue intersection is controlled by a traffic signal. The intersection is configured with separate left turn lanes on each approach, and the north, east and west legs of the intersection have separate right turn lanes as well. Crosswalks are striped across each leg of the intersection.

Childs Avenue/Coffee Street

The Childs Avenue/Coffee Street intersection is controlled by a traffic signal. The intersection is configured with separate left turn lanes on each approach, and crosswalks are striped across each leg of the intersection.

Gerard Avenue/Coffee Street

The Gerard Avenue/Coffee Street intersection is controlled by an all-way stop. The intersection itself is slightly off-center since improvements have been made to opposite sides of Gerard Avenue east and west of the intersection. Crosswalks are striped on the west and north legs of the intersection.

Gerard Avenue/Pluim Drive

The Gerard Avenue/Pluim Drive intersection is a "tee" controlled by a stop sign on the southbound Pluim Drive approach. Each approach has a single lane.

Gerard Avenue/Campus Parkway

The Gerard Avenue/Campus Parkway intersection is controlled by a traffic signal. Each approach has dual left turn lanes and a free right turn lane. Crosswalks are striped across each leg of the intersection.

Pioneer Elementary School Driveways

The Pioneer Elementary School driveways on Coffee Street are "tee" intersections that are controlled by stop signs on the school exits. Each approach is a single lane. The current traffic pattern

employed before and after school features inbound only traffic at the northern driveway and outbound traffic at the middle and southern driveways.

Coffee Street/Parsons Avenue

Only two legs of the Coffee Street/Parsons Avenue intersection are in operation today. Each approach has a single lane, and the intersection is controlled by an all-way stop. A crosswalk is striped on the western leg of the intersection.

Mission Avenue/Southbound SR-99 Ramps

The Mission Avenue/Southbound SR-99 ramps intersection is controlled by a traffic signal. The two-lane off ramp is configured as separate right turn and left turn lanes. A separate westbound right turn lane accommodates traffic headed to Southbound SR-99. There are two through lanes in each direction on Mission Avenue. There are no crosswalks at this intersection.

Mission Avenue/Northbound SR-99 Ramps

The Mission Avenue/Northbound SR-99 ramps intersection is controlled by a traffic signal. The off ramp has separate left turn and right turn lanes. A separate westbound right turn lane leads to Northbound SR-99 as does an eastbound left turn lane. A crosswalk is striped on the south leg of the intersection.

Campus Parkway/Coffee Street

The Campus Parkway/Coffee Street intersection is controlled by an all-way stop. The intersection is configured with two through lanes in each direction on Campus Parkway, and the exiting wide median is striped with a single left turn lane. The northbound Coffee Street approach has two lanes configured as left turn and thru/right turn lanes. The southbound approach is a single lane. A crosswalk is striped on the south leg of the intersection.

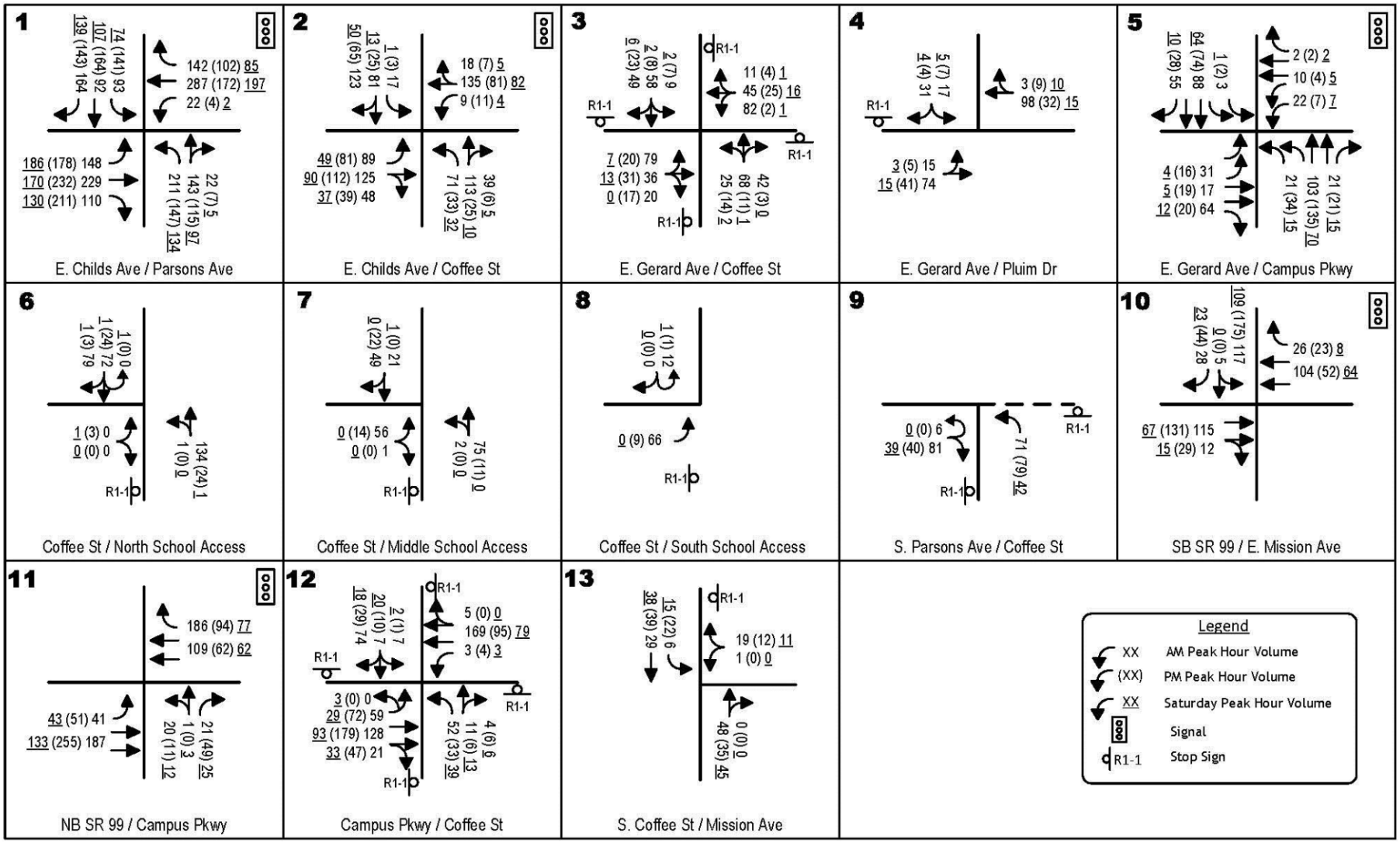
Mission Avenue/Coffee Street/Marino Way

The Mission Avenue/Coffee Street/Marino Way intersection is a “tee” controlled by a stop sign on the westbound Mission Avenue approach. A southbound left turn lane exists, and there are no crosswalks.

Existing Traffic Conditions

Traffic Counts

Traffic count data for the AM peak-hour, PM peak-hour and Saturday midday peak periods were collected for the traffic impact study at the existing study intersections on Wednesday, August 26, 2015 and Saturday, August 29, 2015. Weekday counts were conducted when local schools were in session (including Pioneer Elementary School). Count data were collected in 15-minute intervals for the period from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m. on weekdays and from noon to 2:00 p.m. on Saturdays. The contiguous one-hour period within each period with the highest volumes was used in this traffic impact study as the peak hour. Exhibit 3.11-2 presents the existing lane configurations and existing AM, PM, and Saturday peak-hour traffic volumes at the existing study intersections.



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-2
Existing Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

The extent to which traffic within the hour was concentrated into any particular 15-minute period was determined based on the Peak Hour Factor (PHF) at each intersection. The PHF was incorporated into the LOS analysis to address the specific peaking characteristics of traffic near area schools.

Intersection Levels of Service

Table 3.11-3 presents existing AM peak-hour, PM peak-hour and Saturday peak-hour LOS at the existing study intersections. The worksheets presenting the calculation of LOS and signal warrants under all development conditions including Existing Conditions are included in Appendix I. As indicated in Table 3.11-3, all intersections operate at acceptable LOS during all three time periods. It is important to note that traffic conditions in the immediate vicinity of schools can include congestion that may not appear to be consistent with LOS calculation. Delays created by the operation of a school's drop-off and loading areas that result in queuing back onto public streets is not reflected in intersection Level of Service calculation.

Table 3.11-3: Existing Peak Hour Intersection Levels of Service

#	Intersection	Control	AM Peak Hour		PM Peak Hour		Saturday	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	26.2	C	20.3	C	19.7	B
2	Childs Avenue/Coffee Street	Signal	16.2	B	13.5	B	12.4	B
3	Gerard Avenue/Coffee Street	AWS	10.8	B	7.3	A	7.1	A
4	Gerard Avenue/Pluim Drive SB approach EB left turn	SB Stop	 10.0 7.6	 B A	 8.9 7.3	 A A	 8.7 7.3	 A A
5	Gerard Avenue/Campus Parkway	Signal	13.7	B	10.9	B	9.7	A
6	Coffee Street/North School Access EB approach NB left turn	EB Stop	 0.0 7.8	 — A	 8.9 0.0	 A —	 8.5 0.0	 A —
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 10.7 7.5	 B A	 8.7 0.0	 A —	 0.0 0.0	 — —
8	Coffee Street/South School Access EB approach	EB Stop	 0.0	 —	 0.0	 —	 0.0	 —
9	Coffee Street/Parsons Avenue	AWS	7.8	A	7.4	A	7.1	A
10	Mission Avenue/SB SR-99 ramps	Signal	6.5	A	6.8	A	6.3	A
11	Mission Avenue/NB SR-99 ramps	Signal	7.1	A	6.7	A	6.9	A
12	Campus Parkway/Coffee Street	AWS	10.0	A	8.5	A	8.0	A
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 8.6 7.3	 A A	 8.5 7.3	 A A	 8.6 7.3	 A A

Note:
BOLD = values are Levels of Service in excess of LOS D.
Source: KD Anderson & Associates, Inc., 2016

Roadway Segment Level of Service

Table 3.11-4 identifies current daily traffic volumes on study area roads and compares those volumes to General Plan LOS thresholds. As indicated, all segments operate at LOS C or better, which satisfies the City's minimum LOS D standard.

Table 3.11-4: Existing Roadway Segments Volumes and Levels of Service

Roadway	From	To	Classification	Daily Volume	LOS
Campus Parkway	SR-99	Coffee Street	4 lane Expressway	5,385	C
	Coffee Street	Gerard Avenue	4 lane Expressway	3,490	C
	Gerard Avenue	Childs Avenue	4 lane Expressway	2,998	B
Coffee Street	Childs Avenue	Gerard Avenue	2 lane Collector	2,182	C
SR-99	Childs Avenue	Mission Avenue	6 lane Freeway	40,000	B
	Mission Avenue	South	6 lane Freeway	40,000	B
Source: KD Anderson & Associates, Inc., 2016.					

Traffic Signal Warrants

Table 3.11-5 summarizes the results of review of current peak-hour traffic volumes in comparison to MUTCD peak-hour warrant requirements. As indicated, no un-signalized location carries traffic volumes that reach the level that would satisfy traffic signal warrants.

Table 3.11-5: Existing Traffic Signal Warrant Status

#	Intersection	Peak Hour Warrant Satisfied?		
		AM	PM	Saturday
3	Gerard Avenue/Coffee Street	No	No	No
4	Gerard Avenue/Pluim Drive	No	No	No
12	Campus Parkway/Coffee Street	No	No	No
13	Coffee Street/E. Mission Avenue	No	No	No
Source: KD Anderson & Associates, Inc., 2016.				

Alternative Transportation

Public Transit

The City of Merced is served by a local public bus system known as Merced Transit System (MTS)/City Shuttle. The bus system includes a number of fixed routes within the City, including Route M5 that serves the project vicinity.

Route M5

Route M5–Merced South-East serves the area of the proposed project. This route originates at the downtown Transportation Center on 16th Street and extends east on 2nd Street to the SR-140/Parsons Avenue intersection. From that point the route continues south on Parsons Avenue to Childs Avenue where it begins a counterclockwise loop incorporating Childs Avenue, Campus Parkway and Gerard Avenue that take the route along the project site on Gerard Avenue. Route M5 runs from 6:30 a.m. to 11:00 p.m. Monday thru Friday on roughly 1-hour headways. The route runs from 8:00 a.m. to 6:00 p.m. Saturday and Sunday.

Bicycles

The City of Merced General Plan includes the Bicycle Master Plan which identifies existing and planned facilities. Bicycle facilities are divided into three classes:

- **Class I (Bike Paths or Trails)** which are a completely separate right-of way designated for the exclusive use of bicycles and pedestrians
- **Class II (Bike Lanes)** which provide restricted right-of-way on the street for the exclusive or semi-exclusive use of bicycles.
- **Class III (Bike Routes)** where bicycles are encouraged but bike lanes are not provided and motor vehicles and bicyclists share the right of way.

A Class I path exists along the north side of Campus Parkway.

Class II lanes exist along Parsons Avenue and are planned along Gerard Avenue, Childs Avenue and on Coffee Street north of Gerard Avenue.

Pedestrians

Sidewalks are generally absent along rural Merced County roads but are constructed as properties are annexed into the City of Merced and developed. The following discussion describes the availability of pedestrian facilities in the study area:

Mission Avenue

- South side from a point 0.25 mile west of the SR-99 interchange to the northbound ramps intersection.

Campus Parkway

- South side from the northbound ramps intersection to Coffee Street
- North–West side Trails from Coffee Street to Childs Avenue

Coffee Street

- West side from Campus Parkway to Gerard Avenue
- East side from Gerard Avenue to Childs Avenue

Gerard Avenue

- Both sides from Parsons Avenue to Alfarata Boulevard
- South side from Alfarata Boulevard to Coffee Street
- North side from Coffee Street to Campus Parkway

3.11.3 - Regulatory Setting

State

Caltrans

Caltrans is the state agency responsible for overseeing the state highway system, including SR-99 and SR-140 in the project vicinity. Caltrans maintains a volume monitoring program and reviews local agencies' planning documents to assist in its forecasting of future volumes and congestion points. The Guide for the Preparation of Traffic Impact Studies, published by Caltrans, is intended to provide a consistent basis for evaluating traffic impacts to state facilities. According to this document, Caltrans strives to maintain service levels on state facilities at the transition between LOS C and LOS D.

Regional

Merced County Regional Transportation Plan

The Merced County Association of Governments (MCAG) adopted the 2014 Regional Transportation Plan on September 25, 2014. The plan is a long-range planning document that provides a framework for investment in roads, freeways, public transit, and bike trails in Merced County over a 25-year planning horizon. It also sets forth a Countywide Sustainable Communities Strategy in order to comply with State legislation. The following study facilities fall under the jurisdiction of the Regional Transportation Plan: SR-99, Campus Parkway, and Mission Avenue.

Local

City of Merced

Merced Vision 2030 General Plan

The General Plan Amendment also includes an amendment to the Circulation Element to: (1) eliminate a planned extension of Pluim Drive (collector level street) along the east side of the site; and, (2) to add right turn in and out driveways along the Campus Parkway Expressway (see discussion under "Circulation Alterations"). The existing General Plan Circulation Element is shown in Exhibit 2-6(a) and the proposed General Plan Circulation Element is shown in Exhibit 2-6(b).

3.11.4 - Methodology

K.D. Anderson & Associates, Inc. prepared a Traffic Impact Analysis that evaluated the transportation-related impacts of the proposed project. The Traffic Impact Analysis is provided in Appendix I. The Traffic Impact Analysis methodology is summarized below.

Traffic Study Scenarios

This analysis is intended to evaluate the relative traffic impacts of the project within a range of relevant scenarios as required under City of Merced guidelines. The analysis considers traffic

conditions occurring during weekday AM and PM peak hours, as well as midday peak conditions on Saturdays.

At the City of Merced's direction, the traffic study considers the following scenarios:

- Existing Conditions
- Existing Conditions Plus Project Build Out with Circulation as proposed
- Existing Conditions Plus Project Build Out with General Plan Circulation System
- Existing Plus Approved Projects (EPAP) Conditions without the proposed Project
- EPAP Conditions with Project Build Out with Circulation as proposed
- Year 2035 Cumulative Conditions with Project Build Out and Circulation as proposed
- Year 2035 Cumulative Conditions with Project Build Out and General Plan Circulation System.

The traffic analysis also addresses project impacts to alternative transportation modes, including evaluation of relative impacts to circulation in the vicinity of Pioneer Elementary School and truck access.

Project Use/Access Characteristics

The Merced Gateway Master Plan includes a variety of specific land uses located north and south of Campus Parkway. The development plan includes twelve points of access that are also evaluated in this analysis.

Trip Generation Rates

The number of vehicle trips that are expected to be generated by development of the proposed project has been estimated using trip generation rates based on the nature and size of project land uses. Data compiled by the Institute of Transportation Engineers (ITE) and presented in the publication Trip Generation, 9th Edition (Institute of Transportation Engineers 2012) is the source of trip generation rates for the uses within the proposed project. The trip generation rates used in this analysis are presented in Table 3.11-6.

A conservative approach has been taken to estimate project trip generation which yields a "worst case" assessment. As indicated, available rates have been employed for those areas with a specific land use designation, including those areas designated for food services, gasoline sales, supermarket, and movie theater. Those areas broadly designated as "retail" have been assigned trip generation rates based on the ITE "Shopping Center" designation and use of the regression equations accompanying land use category 820.

Trip Generation Forecasts

Table 3.11-7 identifies the results of applying the identified trip generation rates to the land use inventory. As indicated, buildout of the plan would result in a "gross" total of 39,460 daily trips, with 2,146 trips occurring in the AM peak hour, 3,250 trips expected in the weekday PM peak hour, and 4,768 trips occurring in the Saturday peak hour.

A portion of these trips would likely be made between uses on the site; 5 percent of the gross trips have been assumed to be internal.

Similarly, many of the trips associated with retail uses are drawn from the stream of background traffic passing the site as part of another trip. Because existing traffic volumes in the area of the project are relatively small, these "pass-by" trips would represent a very minor share of the project's total trip generation under "Existing Plus Project" conditions. However, Table 3.11-7 identifies the typical share of the trips associated with various retail uses when background conditions are more favorable, as would be the case under long term Year 2035 conditions. Under Year 2035 conditions, after discount for "pass-by" trips, the project could be expected to result in 26,643 net new trips on a daily basis, with 1,283 new trips in the AM peak hour, 2,229 new trips in the PM peak hour, and 3,200 new trips in the peak Saturday hour.

Table 3.11-6: Merced Gateway Trip Generation Rates

Code	Description	Unit	Trip Generation Rates per Unit									
				AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
			Daily	In	Out	Total	In	Out	Total	In	Out	Total
220	Multiple Family Residential	Dwelling Unit	6.65	20%	80%	0.51	65%	35%	0.62	50%	50%	0.52
—	Fire Station	Firefighter	4.34	50%	50%	2.00	50%	50%	2.00	5%	50%	0.50
—	Transit Center	each	20	50%	50%	2.00	50%	50%	2.00	—	—	—
934	Fast Food Restaurant with drive-thru	ksf	496.12	51%	49%	45.42	52%	48%	32.65	51%	49%	59.00
946	Gasoline Sales with C-store	Fueling Position	152.84	51%	49%	11.84	51%	49%	13.86	50%	50%	19.46
932	Sit Down Restaurant	ksf	127.15	55%	45%	10.81	60%	40%	9.95	53%	47%	14.07
850	Supermarket	ksf	102.24	62%	38%	3.40	51%	49%	9.48	51%	49%	10.65
861	Sporting Goods Superstore	ksf	18.40	62%	38%	0.91	48%	52%	1.84	51%	49%	3.84
810	Tractor Supply Store	ksf	14.0	62%	38%	0.91	47%	53%	1.40	49%	51%	3.17
820	SC Retail (400 ksf+)	ksf	41.80	62%	38%	0.91	48%	52%	3.79	52%	48%	5.38
445	Movie Theater	ksf	62.65	—	—	—	62%	38%	4.91	75%	25%	4.70
310	Motel/Hotel	room	8.17	59%	41%	0.53	51%	49%	0.60	56%	44%	0.72

Notes:
sf = square feet; ksf = thousand square feet
Source: KD Anderson & Associates, Inc., 2016.

Table 3.11-7: Merced Gateway Trip Generation Forecasts

Description	Quantity	Trip Generation Rates per Unit									
		Daily	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
			In	Out	Total	In	Out	Total	In	Out	Total
North											
Multiple Family Residential	178 du	1,183	18	73	91	72	38	110	46	47	93
Fire Station	4 fire fighters	17	4	4	8	4	4	8	1	1	2
Transit Center	1	20	1	1	2	1	1	2	0	0	0
Sit-Down Restaurants (5)	26.62 ksf	3,385	158	130	288	149	100	249	199	176	375
Movie Theater	38.77 ksf	2,429	0	0	0	118	72	190	137	45	182
Supermarket	54.18 ksf	5,540	114	70	184	262	252	514	294	283	577
Retail	242.61 ksf	10,141	137	84	221	441	478	919	679	626	1,305
Total		**22,715**	**432**	**362**	**794**	**1,047**	**945**	**1,992**	**1,356**	**1,178**	**2,534**
South											
Fast Food Restaurant with drive-thru (4)	21.45 sf	10,642	497	477	974	364	336	700	645	621	1,266
Gasoline Sales with C-store	12 Fueling Position	1,834	72	70	142	85	81	166	117	117	234
Sit Down Restaurant (1)	4.33 ksf	551	26	21	47	25	16	41	32	29	61
Sporting Good Superstore	131.19 ksf	2,414	74	45	119	116	125	241	257	247	504
Tractor Supply Store	21.28 ksf	298	12	7	19	14	16	30	33	34	67
SC Retail (400 ksf+)	8.24 ksf	344	5	3	8	15	16	31	23	21	44
Hotel	81 rooms	662	25	18	43	25	24	49	33	25	58
Total		**16,745**	**711**	**641**	**1352**	**644**	**614**	**1,258**	**1,140**	**1,094**	**2,234**
Total Project Trips—Gross		39,460	1,143	1,003	2,146	1,691	1,559	3,250	2,496	2,272	4,768

Table 3.11-7 (cont.): Merced Gateway Trip Generation Forecasts

Description	Quantity	Trip Generation Rates per Unit								
			AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Daily	In	Out	Total	In	Out	Total	In	Out	Total
Less Internal Trips (5%)		1,973	57	50	107	85	78	163	125	114	239
External Trips		**37,487**	**1,086**	**953**	**2,039**	**1,606**	**1,481**	**3,087**	**2,371**	**2,158**	**4,529**
Pass-By Trips											
Fast Food Restaurants (50% of external)		4,789	236	227	463	173	160	333	306	295	601
Gasolines sales (50% of external)		871	34	33	67	40	38	78	56	56	112
Sit Down Restaurants (35% of external)		1,309	61	50	111	58	39	97	77	68	145
Supermarket (36% of external)		1,994	39	24	63	90	86	176	101	97	198
All other Retail (15% of external)		1,881	32	20	52	79	90	174	141	132	274
Total Pass-By		10,844	402	354	756	440	413	858	681	648	1330
Total Net New External Trips		**26,643**	**684**	**599**	**1,283**	**1,166**	**1,068**	**2,229**	**1,690**	**1,510**	**3,200**

Notes:
sf = square feet; ksf = thousand square feet
Source: KD Anderson & Associates, Inc., 2016.

Trip Distribution

The geographic distribution of vehicle trips associated with the proposed project has been determined from review of select zone analysis results from the MCAG regional travel demand forecasting model, consideration of the nature of land uses in each area, and consideration of current travel patterns. For example, many of the south area uses are "convenience oriented" uses that will be more likely to be drawn off traffic on SR-99 than the community-oriented uses in the northern area. Thus, the share of trips oriented south on SR-99 is greater for the south area than for the north. Table 3.11-8 summarizes the trip distribution assumptions.

Because the eventual extension of Campus Parkway will have a tangible effect on circulation choices, select zone analysis was conducted for a model Year 2010 scenario that reflects Campus Parkway's current terminus at Childs Avenue and for a Year 2035 condition that assumes Campus Parkway is extended to Yosemite Avenue.

Table 3.11-8: Merced Gateway Commercial Uses Trip Distribution Assumptions

Direction	Percent of Total Trips			
	North Area		South Area	
	EPAP	Year 2035	EPAP	Year 2035
North on SR-99	54%	29%	48%	27%
South on SR-99	12%	22%	23%	31%
West on Mission Avenue	7%	10%	6%	8%
West on Childs Avenue	3%	5%	3%	4%
North on Parsons Avenue	4%	2%	4%	2%
North on Coffee Street	2%	2%	0%	1%
North on Campus Parkway	0%	21%	0%	19%
East of Childs Avenue	4%	1%	3%	1%
East on Gerard Avenue	1%	1%	1%	1%
Residential Areas South of SR-140 and East of SR-99	8%	5%	5%	4%
East on Mission Avenue	0%	1%	1%	1%
South on Marino Way	0%	1%	1%	1%
Internal	5%	0%	5%	0%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Source: KD Anderson & Associates, Inc., 2016.				

Trip Assignment

Exhibit 3.11-3 and Exhibit 3.11-4 illustrate "project only" trips through study area intersections and at project driveways under the short term future condition (i.e., Existing Plus Project and EPAP Plus Project conditions with the project access as proposed).

Exhibit 3.11-5 and Exhibit 3.11-6 present "project only" trips under a short-term condition that assumes the project was re-configured to be consistent with the General Plan Circulation Element. Under this alternative the proposed Central Access on Campus Parkway would be closed and full access would be created at the Campus Parkway/Pluim Drive intersection.

Project Improvements—Proposed Circulation

As part of the project, an extension of Parson Avenue would be constructed through the north area. The roadway would extend from the intersection of Coffee Street/Parsons Avenue to the project's eastern boundary.

Additionally, the proposed project would install frontage improvements along Gerard Avenue, Coffee Street, and Mission Avenue. The proposed project includes development of right turn only access to Campus Parkway at two locations on the north and south sides of the street. The conceptual plan indicates that the Campus Parkway access will be accompanied by right turn acceleration and deceleration lanes, and that the westbound acceleration from the central access will continue into a separate westbound right turn lane at the Campus Parkway/Coffee Street intersection.

The Coffee Street/Parsons Avenue intersection is assumed to have separate left turn lanes on the northbound and westbound approaches and will be controlled by an all-way stop.

No additional improvements that would alter existing roadway geometry have been assumed under the "Access as Proposed" alternative.

Project Improvements—General Plan Circulation Access Alternative

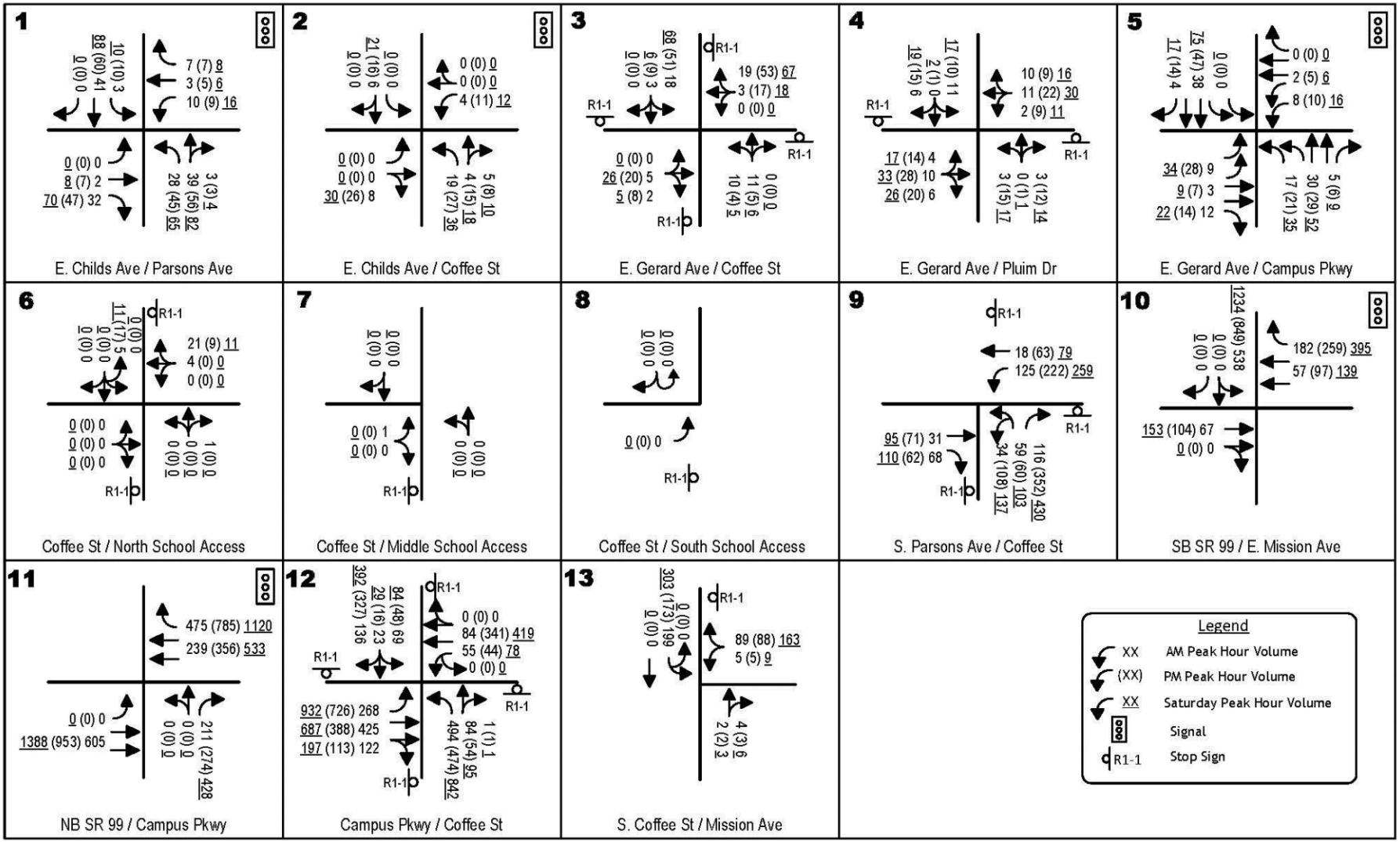
Alternative improvements have been assumed under the General Plan circulation system access alternative. The Campus Parkway/Pluim Drive intersection is assumed to be configured with separate left turn and right turn lanes on each approach, and the intersection is assumed to be controlled by stop signs on the Pluim Drive approaches. Separate left turn lanes have again been assumed at the Coffee Street/Parsons Avenue intersection.

The Campus Parkway/Coffee Street would be reconfigured to limit the northbound and southbound Coffee Street approaches to right turn entrance and exit only, while eastbound and westbound left turns from Campus Parkway will occur.

Truck Access—Proposed Project

Trucks serving the proposed project would exit SR-99 at the Mission Boulevard interchange and head east to the intersection of Campus Parkway/Coffee Street. Trucks serving the north area would turn left at Coffee Street and enter the site at one of the driveways on this roadway or the Parsons Avenue extension. Trucks exiting the north area would turn right at Campus Parkway and travel west to SR-99.

Trucks serving the south area would either enter the site at one of the Campus Parkway driveways or turn right of Coffee Street and enter the site at one of the driveways along this roadway. Trucks existing the south area would turn onto Coffee Street and turn left at Campus Parkway in order to travel to SR-99.

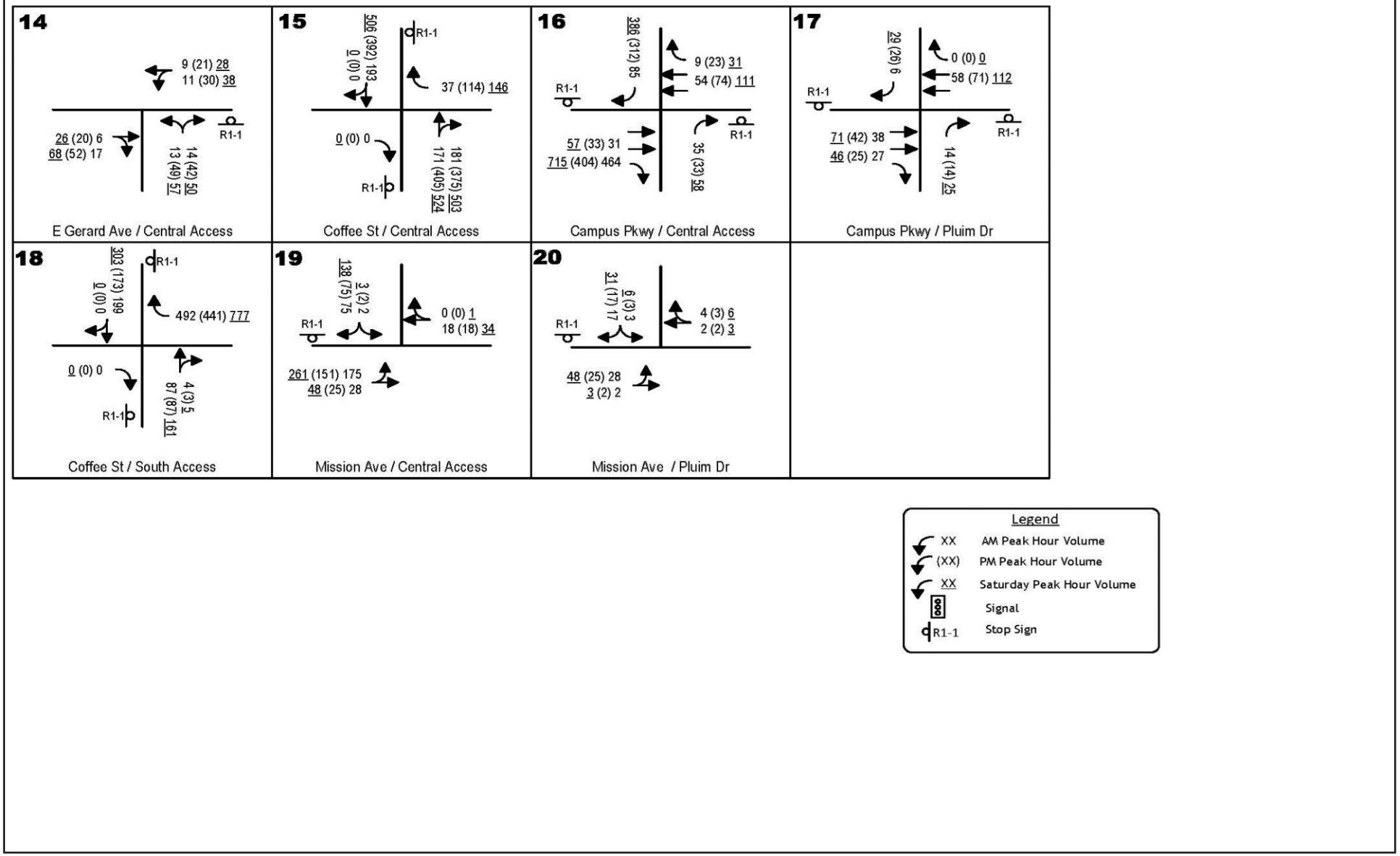


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-3
Project Only / Access as Proposed Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

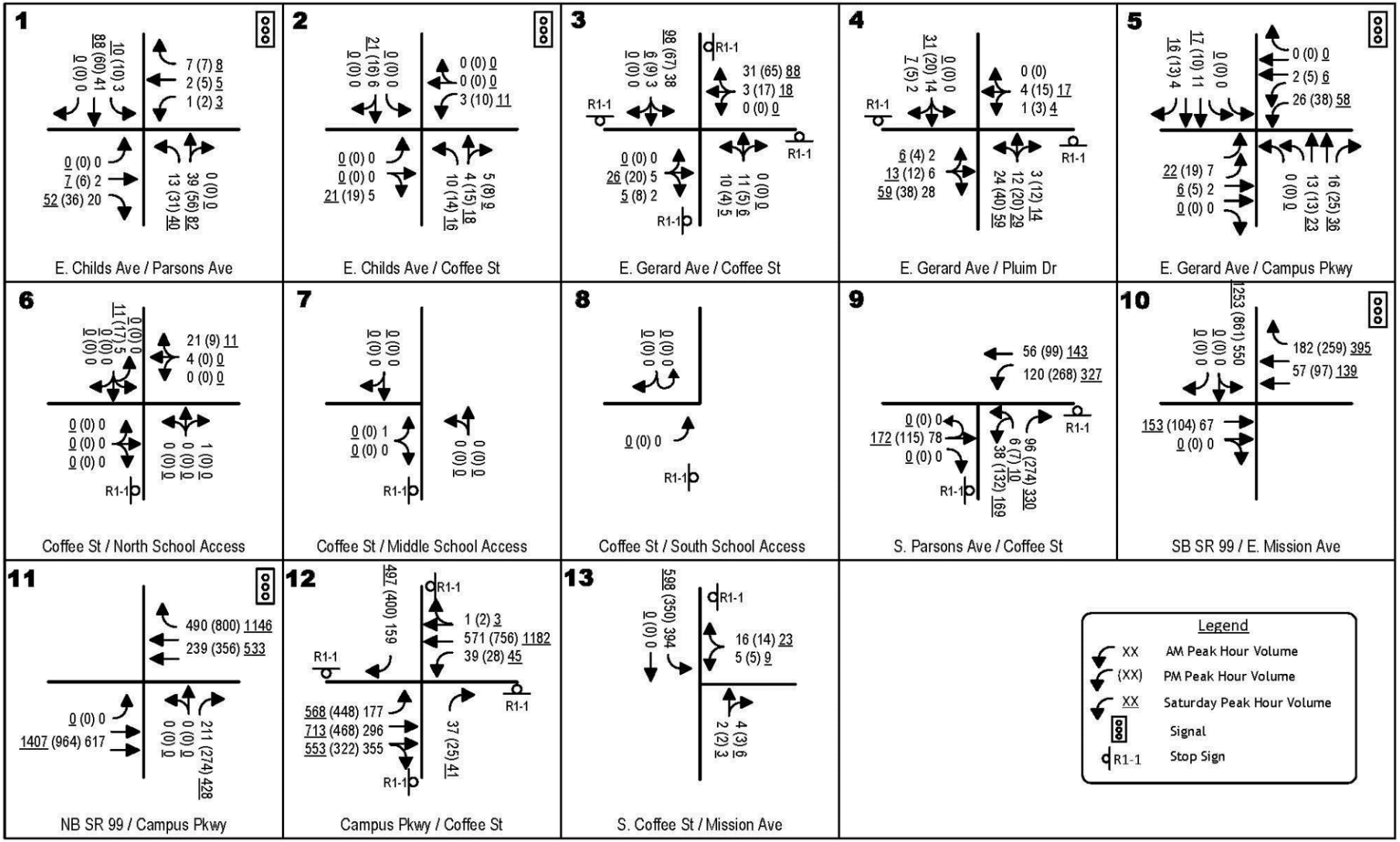


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-4
Project Only/ Access as Proposed Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

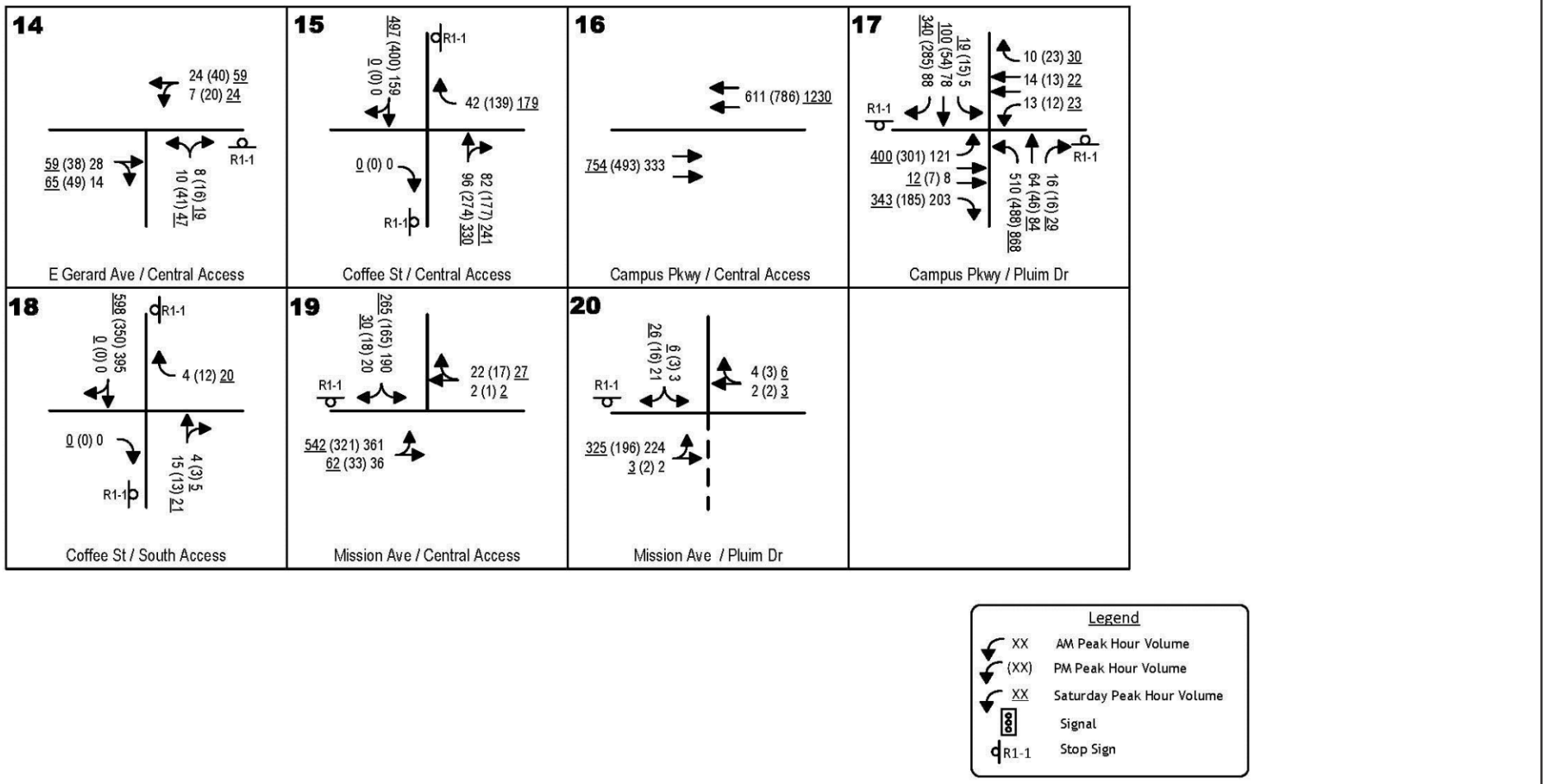


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-5
Project Only With General Plan Streets Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-6
Project Only With General Plan Streets Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

The rear of the supermarket illustrated in the northern commercial area is accessible from the Parsons Avenue extension, via the eastern connection to Campus Parkway, and to a lesser extent via the eastern connection to Gerard Avenue. Outbound truck traffic could use the same points of access.

Truck Access—General Plan Circulation Alternative

It is likely that the site would be reconfigured under the General Plan alternatives with a public road (Pluim Drive) along the eastern project boundary leading to a signalized intersection on Campus Parkway. Building orientations may change. However, it is possible that major stores with truck access requirements would be positioned to allow loading docks ready access to the Pluim Drive extension, and full access would be available at the signalized Campus Parkway/Pluim Drive intersection.

Under this scenario, trucks serving the north area (and the future Business Park uses) would travel to and from SR-99 on Campus Parkway and turn at the signalized Pluim Drive intersection.

3.11.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether transportation and traffic impacts are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? (Refer to Section 7, Effects Found not to be Significant)

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

e) Result in inadequate emergency access?

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

In the context of Checklist questions a) and b), the following methods were employed to determine the significance of Level of Service are noted in the General Plan and in Merced's traffic study guidelines.

Implementing Action T-1.8.b of the Merced Vision 2030 General Plan (City of Merced 2010) establishes an acceptable LOS of D for intersections and roadways. Action T-1.8.b states:

> 1.8.b: Use peak-hour Level of Service "D" ("Tolerable Delays") as the design standard for new streets and intersections in new growth areas.
>
> The preferred LOS levels are typically "C" and "D," particularly for larger roads and major intersections. With LOS C the road provides stable operation but is still underutilized to some degree. LOS D represents a fine balance between the relatively large number of vehicles served and the generally acceptable level of service provided. It is the intent of the City's standards and policies for new and most upgraded intersections and road segments to be designed and built so as not to drop below LOS D ("tolerable delay") during peak traffic periods.

Therefore, LOS A through D are considered acceptable for signalized intersections, while LOS E and F are unacceptable.

At two-way stop-sign-controlled intersections (or one-way stop T intersections), Level of Service can be calculated for each movement where motorists yield the right of way, as well as for the intersection as a whole. Significance is based on the length of the average delay experienced by motorists on the worst case movement, which is typically a left turn made from the stop-sign-controlled approach to the intersection. It should be noted that overall intersection average LOS at unsignalized intersections is often much better than LOS on the worst single movement.

Under City of Merced guidelines; however, a poor "worst case" LOS is not necessarily significant unless the intersection also carries traffic volumes which satisfy peak-hour traffic signal warrant requirements. Traffic signal warrants are a series of several standards that provide guidelines for determining if a traffic signal is appropriate. Signal warrant analyses are typically conducted at intersections of uncontrolled major streets and stop sign-controlled minor streets. If one or more signal warrants are met, signalization of the intersection may be appropriate. However, a signal should not be installed if none of the warrants are met, since the installation of signals would increase delays on the previously-uncontrolled major street, and may increase the occurrence of particular types of accidents.

Consistent with the California Environmental Quality Act (CEQA), the City will use the traffic analysis to determine the project's impact to two broad CEQA checklist topics: (1) substantial increases in traffic; and (2) changes to level-of-service. Each of these broad categories have distinct thresholds of significance (described below) and are to be utilized in the traffic study.

1. **Topic: Substantial Increase in Traffic Levels**
   A. Arterial Level Road: The threshold of significance is a project ADT contribution equal or greater than 5% of the current ADT for an "arterial roadway" that is, or will be, operating at an unacceptable LOS "E" or "F".
   B. Collector Level Road: The threshold of significance is an amount where the Project contributes more than 20% of the current ADT on roads carrying at

least 3,000 ADT. Thus, a significant impact would occur if a Project adds 601 ADT to a collector road that currently has 3,000 ADT. [3,000(.20)]

2. **Topic: Change in Level of Service (LOS) Rating**
   Merced Vision 2030 General Plan Policy T-1.8 states: Use A Minimum Peak Hour Level of Service (LOS) "D" As a Design Objective for All New Streets in New Growth Areas and for Most Existing City Streets Except Under Special Circumstances. To implement this Policy, the City focuses on four different street system categories, each described in greater detail below: (A) roadways; (B) signalized intersections; (C) unsignalized intersections; and (D) roads within established neighborhoods.

3.11.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.

Existing Plus Project Traffic

Impact TRANS-1: **The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing Plus Project Conditions.**

Impact Analysis

This analysis scenario assumes that the Merced Gateway Project precedes the other approved projects listed in Table 3.11-20 and is fully built out. (The Merced Gateway Project, in conjunction with other approved projects, is addressed in Impact TRANS-2.)

Traffic Volumes

Traffic Diversions

Under the General Plan Circulation Alternative, traffic that today turns left onto Campus Parkway at Coffee Street or continues across the expressway would be diverted, primarily to the Campus Parkway/Pluim Drive intersection. The diverted hourly volumes are tabulated in Table 3.11-9.

Table 3.11-9: Short-term Traffic Diversion

Movements	Hourly Volume Diverted		
	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Northbound Coffee Street Diversion to Pluim Drive under GP Circulation Alternative	63 vph	39 vph	52 vph
Southbound Coffee Street Diversion to Pluim Drive under GP Circulation Alternative	14 vph	11 vph	22 vph

Existing Plus Project Traffic Volumes

Exhibit 3.11-7 and Exhibit 3.11-8 present resulting AM, PM, and Saturday peak-hour volumes, assuming the project is built out with access as proposed. Exhibit 3.11-9 and Exhibit 3.11-10 illustrate corresponding volume assuming the project proceeds with the adopted General Plan Circulation layout.

Intersection Level of Service

Table 3.11-10, Table 3.11-11, and Table 3.11-12 present the AM, PM, and Saturday peak-hour Level of Service at each study intersection under Existing Plus Project conditions under both access scenarios (i.e., Access as Proposed and with adopted General Plan Circulation).

Table 3.11-10: Existing Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour					
			Existing		Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	26.2	C	27	C	25	C
2	Childs Avenue/Coffee Street	Signal	16.2	B	18	B	18	C
3	Gerard Avenue/Coffee Street	AWS	10.8	B	7	A	7	A
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 10.0 — 7.6 —	 B — A —	 3 3 1 1	 A A A A	 6 5 1 1	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	13.7	B	7	A	7	A
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 0.0 — 7.8 —	 — — A —	 0 32 3	 — A A A	 — 3 2 3	 A A A A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 10.7 7.5	 B A	 5 0	 A A	 5 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 0.0	 —	 5	 A	 5	 A
9	Coffee Street/Parsons Avenue	AWS	7.8	A	4	A	5	A
10	Mission Avenue/SB SR-99 ramps	Signal	6.5	A	76	**F**	12	B
11	Mission Avenue/NB SR-99 ramps	Signal	7.1	A	74	**F**	8	A
12	Campus Parkway/Coffee Street	AWS	10.0	A	108	**F**	13	B

Table 3.11-10 (cont.): Existing Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour					
			Existing		Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 8.6 7.3	 A A	 30 1	 D A	 4 2	 A A
14	Gerard Avenue/Project Access NB approach WB left	NB Stop	 —	 —	 3 1	 A A	 3 1	 A A
15	Coffee Street/Central Access EB approach	WB Stop	 —	 —	 3	 A	 3	 A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 —	 —	 2 2	 A A	 —	 —
17	Campus Parkway/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	 —	 —	 1 2	 A A	 **265** 20 3 4	 **F** C A A
18	Coffee Street/South Access WB approach	WB Stop	 —	 —	 160	 **F**	 2	 A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 —	 —	 5 2	 A A	 14 2	 B A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	 —	 —	 1 1	 A A	 2 **45**	 A **E**

Source: KD Anderson & Associates, Inc., 2016.

Table 3.11-11: Existing Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour					
			Existing		Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	20.3	C	24	C	24	C
2	Childs Avenue/Coffee Street	Signal	13.5	B	12	B	12	B
3	Gerard Avenue/Coffee Street	AWS	7.3	B	5	A	6	A
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 — 8.9 7.3 —	 — A A —	 3 2 1 1	 A A A A	 5 6 1 1	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	10.9	B	7	A	7	A
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 8.9	 A —	 5 4 0 3	 A A — A	 5 1 0 2	 A A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 8.7 0.0	 B —	 4 0	 A —	 4 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 0.0	 —	 4	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	7.4	A	94	F	6	A
10	Mission Avenue/SB SR-99 ramps	Signal	6.8	A	713	**F**	32	C
11	Mission Avenue/NB SR-99 ramps	Signal	6.7	A	128	**F**	14	B
12	Campus Parkway/Coffee Street	AWS	8.5	A	154	**F**	32	D

Table 3.11-11 (cont.): Existing Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour					
			Existing		Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 8.5 7.3	 A A	 94 1	 **F** A	 5 7	 A B
14	Gerard Avenue/Project Access NB approach WB left	NB Stop	—	—	 3 1	 A A	 3 1	 A A
15	Coffee Street/Central Access EB approach	WB Stop	—	—	 15	 C	 4	 A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	—	—	 2 75	 A F	—	—
17	Campus Parkway/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	—	—	 1 2 0 0	 A A — —	 **519** 19 4 4	 **F** C A A
18	Coffee Street/South Access WB approach	WB Stop	—	—	 **187**	 **F**	 2	 A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	—	—	 24 2	 C A	 **127** 21	 **F** C
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	—	—	 1 1	 A A	 2 **399**	 A **F**

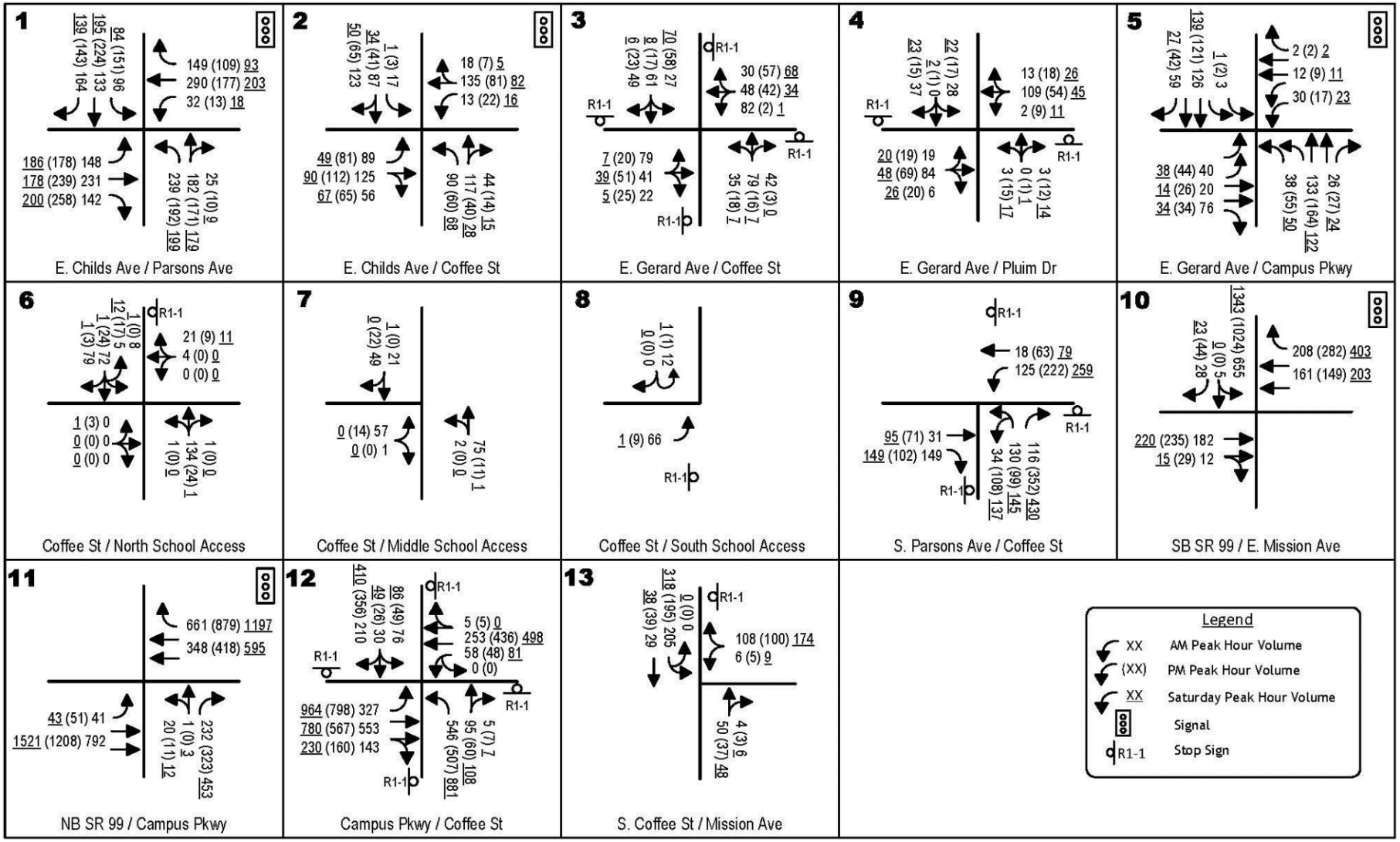
Source: KD Anderson & Associates, Inc., 2016.

Table 3.11-12: Existing Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour					
			Existing		Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	19.7	B	23	C	22	B
2	Childs Avenue/Coffee Street	Signal	12.4	B	12	B	10	B
3	Gerard Avenue/Coffee Street	AWS	7.1	A	4	A	5	A
4	Gerard Avenue/Pluim Drive	NB/SB Stop						
	SB approach		—	—	3	A	6	A
	NB approach		8.7	A	2	A	6	A
	EB left turn		7.3	A	1	A	1	A
	WB left turn		—	—	1	A	1	A
5	Gerard Avenue/Campus Parkway	Signal	9.7	A	7	A	6	A
6	Coffee Street/North School Access	EB/WB Stop						
	EB approach		8.5	A	0	—	0	—
	WB approach		—	—	1	A	1	A
	NB left turn		—	—	0	—	0	—
	SB left turn		—	—	3	A	3	A
7	Coffee Street/Central School Access	EB Stop						
	EB approach		0.0	—	0	—	0	—
	NB left turn		0.0	—	0	—	0	—
8	Coffee Street/South School Access	EB Stop		—				
	EB approach		0.0		0	A	0	A
9	Coffee Street/Parsons Avenue	AWS	7.1	A	**266**	**F**	8	A
10	Mission Avenue/SB SR-99 ramps	Signal	6.3	A	**748**	**F**	**115**	**F**
11	Mission Avenue/NB SR-99 ramps	Signal	6.9	A	**142**	**F**	**95**	**F**
12	Campus Parkway/Coffee Street	AWS	8.0	A	**163**	**F**	**63**	**F**

Table 3.11-12 (cont.): Existing Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour					
			Existing		Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 8.6 7.3	 A A	 **163** 1	 **F** A	 4 25	 A D
14	Gerard Avenue/Project Access NB approach WB left	NB Stop	 —	 —	 4 2	 A A	 3 2	 A A
15	Coffee Street/Central Access EB approach	WB Stop	—	—	28	D	4	A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	—	—	2 **136**	A **F**	—	—
17	Campus Parkway/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	—	—	1 2 — —	A A — —	**541** **48** 4 5	**F** **E** A A
18	Coffee Street/South Access WB approach	WB Stop	—	—	**292**	**F**	2	A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	—	—	72 2	F A	**279** **44**	**F** **E**
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	—	—	1 1	A A	2 **538**	A **F**

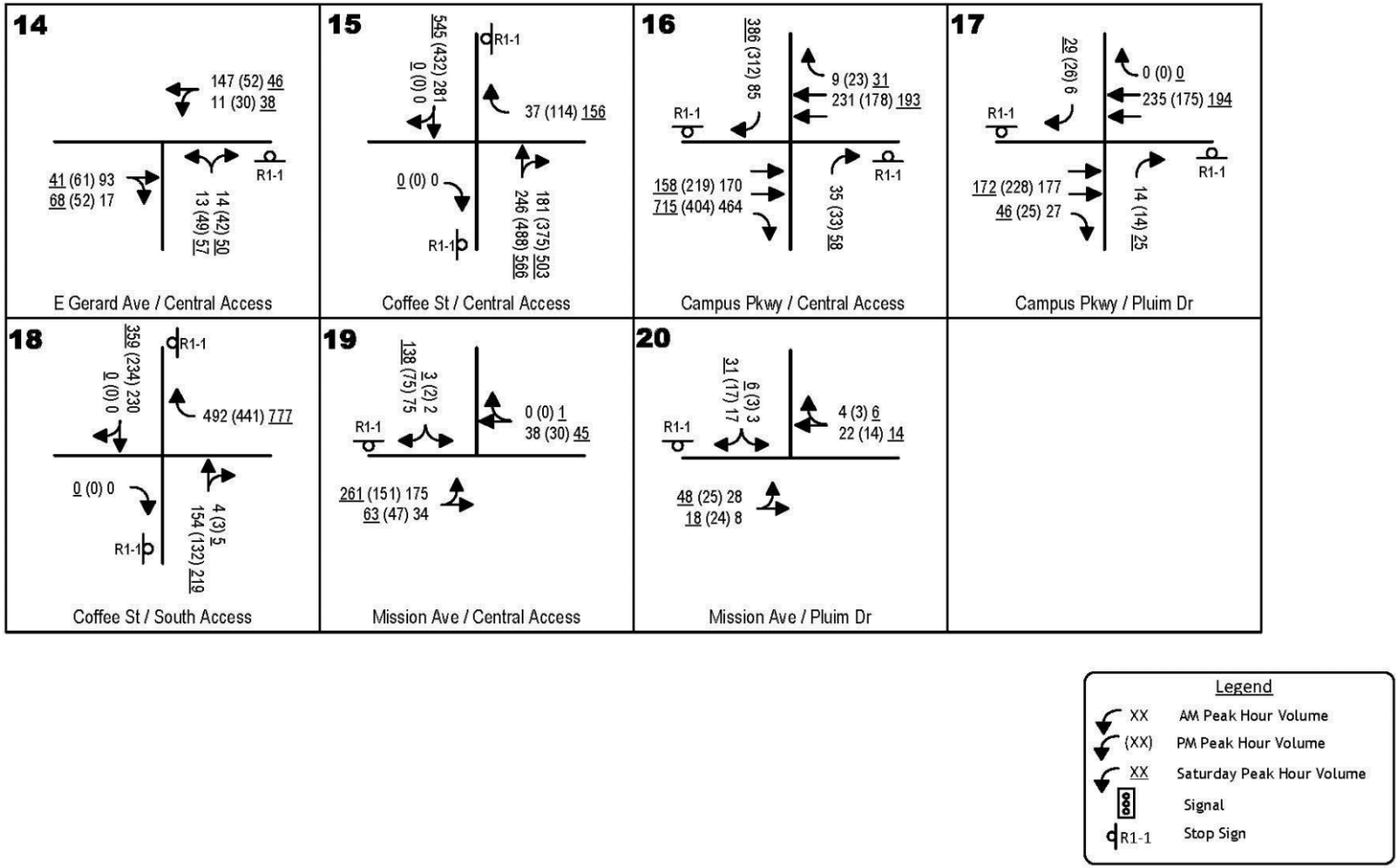


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-7
Existing Plus Project / Access as Proposed Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

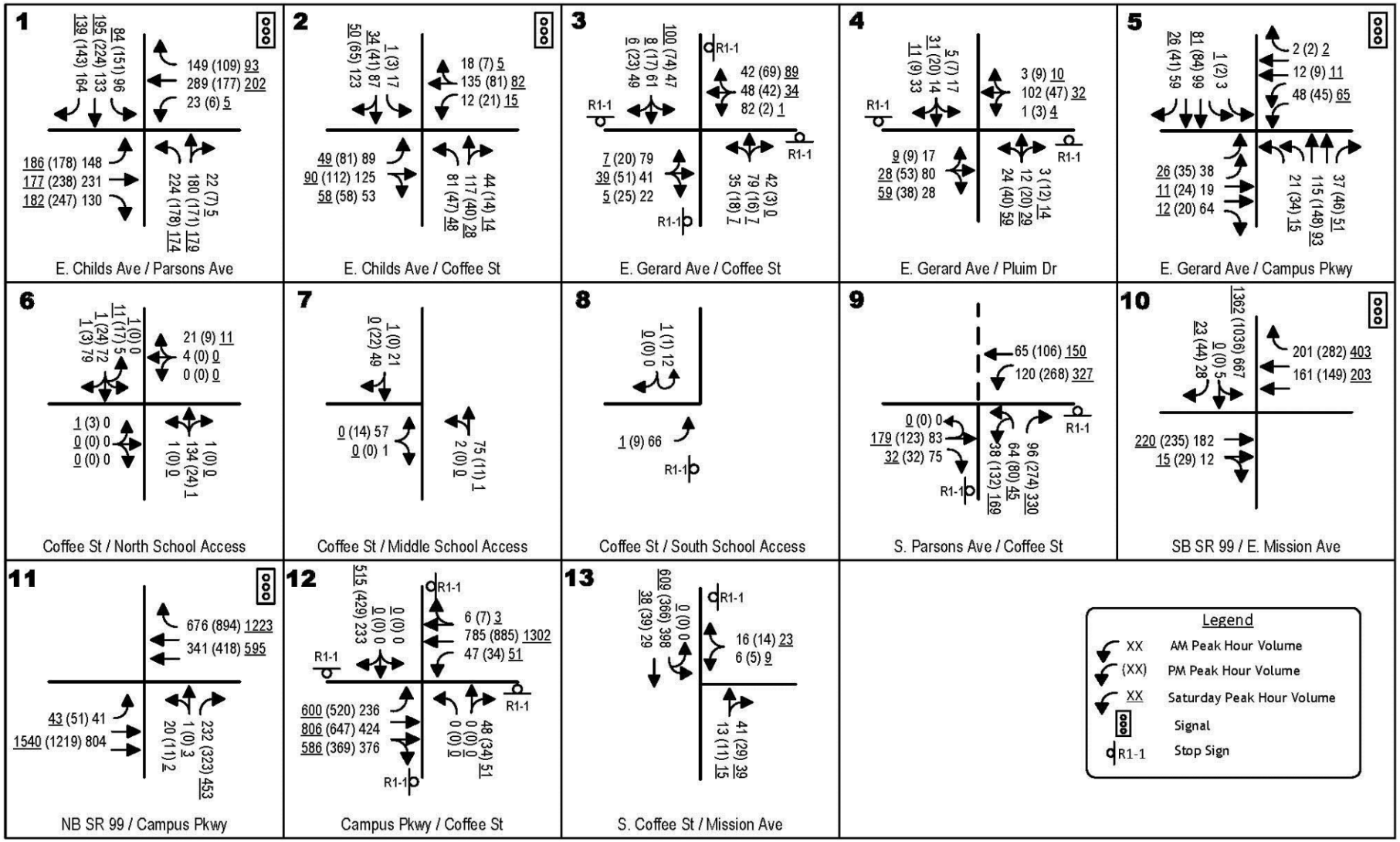


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-8
Existing Plus Project / Access as Proposed Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

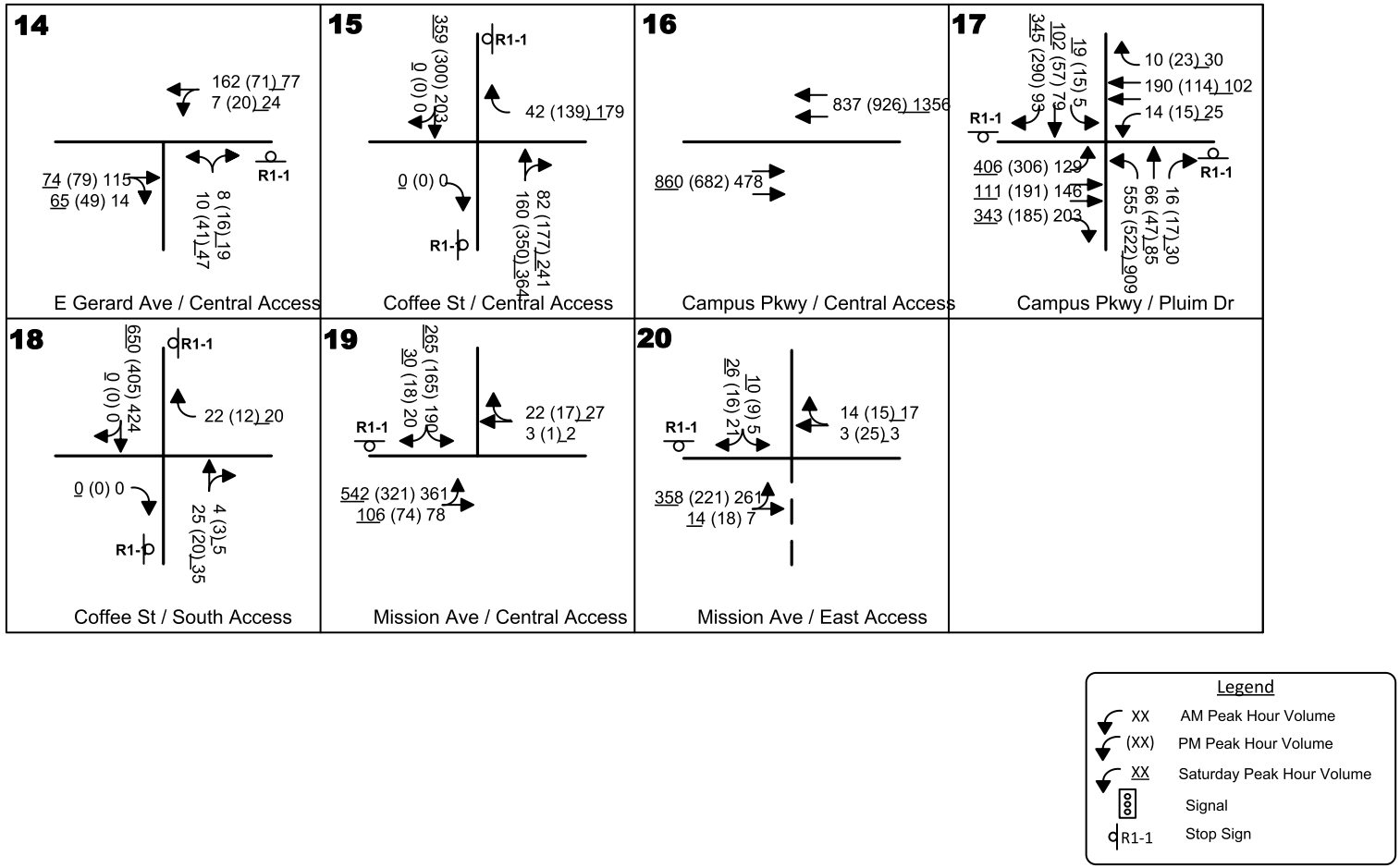


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-9
Existing Plus Project With General Plan Streets Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon SOLUTIONS

Exhibit 3.11-10
Existing Plus Project With General Plan Streets
Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

Condition with Access as Proposed

If the project is developed with access as proposed and no additional improvements are made, then the following intersections are projected to operate with Levels of Service that exceed the minimum LOS D standard, as noted in Table 3.11-13. As indicated, eight intersections or driveways will operate with Level of Service that exceeds the LOS D minimum, that is, at E or F.

It is important to note that the conditions at many locations are not the result of traffic volumes in excess of intersection capacity. Instead, simulation results indicate that queueing from adjoining major intersections extends to many locations and results in overall delays that are in excess of the standard. The primary factor in this regard is the capacity of the all-way stop control at the Campus Parkway/Coffee Street intersection. Peak period queues from this intersection extend north in all directions and result in deficient Level of Service as noted in Table 3.11-13.

Table 3.11-13: Summary of LOS Deficiencies Existing Plus Project Conditions

#	Intersection	LOS in Excess of LOS D					
		Access as Proposed			General Plan Circulation		
		AM	PM	Saturday	AM	PM	Saturday
9	Coffee St/Parsons Ave	—	Yes	Yes	—	—	—
10	Mission Ave/SB SR-99	Yes	Yes	Yes	—	—	Yes
11	Mission Ave/NB SR-99	Yes	Yes	Yes	—	—	Yes
12	Campus Pkwy/Coffee St	Yes	Yes	Yes	—	—	Yes
13	Coffee St/Mission Ave	—	Yes	Yes	—	—	—
16	Campus Pkwy/Central Access	—	Yes	Yes	—		
17	Campus Pkwy/Pluim Dr	—	—	—	Yes	Yes	Yes
18	Coffee St/South Access	Yes	Yes	Yes	—	—	—
19	Mission Ave/Central Access	—	—	Yes	—	Yes	Yes
20	Mission Ave/Pluim Dr	—	—	—	Yes	Yes	Yes

Source: KD Anderson & Associates, Inc., 2016.

General Plan Circulation Plan Access

Table 3.11-13 also summarizes the locations with Level of Service in excess of LOS D if the project is built out with circulation that is consistent with the General Plan Circulation Element. Six intersections or driveways would have a deficient Level of Service. The all-way stop-controlled Campus Parkway/Coffee Street intersection and Campus Parkway/Pluim Drive intersection would operate at LOS F and queueing associated with these intersections would result in conditions in excess of LOS D at other locations. Three locations would carry traffic volumes that satisfy traffic signal warrants. The Mission Avenue/SR-99 ramps intersections would be affected on Saturday, and queuing from Campus Parkway would extend to the driveway on Mission Avenue.

Roadway Segment Level of Service

Table 3.11-14 compares existing daily traffic volumes with the volumes occurring if the proposed project is built out with access as proposed, and if the General Plan Circulation diagram is implemented. As indicated, in either case the daily traffic volume on Campus Parkway between SR-99 and Coffee Street would be indicative of LOS D or better conditions under the General Plan LOS thresholds.

If the proposed project is built out with the roads as proposed, then the daily traffic volume on Coffee Road between Parsons Avenue and Campus Parkway would operate at LOS F under the General Plan LOS thresholds. All other segments would operate at LOS D or better.

If the project proceeds with the General Plan Circulation system, all segments would operate at LOS C or D.

Table 3.11-14: Existing Plus Merced Gateway Daily Traffic Volumes and Level of Service

Street	From	To	Classification	Existing Conditions		Existing Plus Project Access as Proposed		
						Daily Volume		
				Daily Volume	LOS	Added	Total	LOS
Campus Parkway	SR-99	Coffee Street	4 lane Expressway	5,385	C	28,600	33,985	D
	Coffee Street	Central Access	4 lane Expressway	3,490	C	10,000	13,490	C
	Central Access	Pluim Drive	4 lane Expressway	3,490	C	2,050	5,540	C
	Pluim Drive	Gerard Avenue	4 lane Expressway	3,490	C	1,600	5,090	C
	Gerard Avenue	Childs Avenue	4 lane Expressway	2,998	B	1,450	4,448	C
Coffee Street	Childs Avenue	Gerard Avenue	2 lane Collector	2,182	C	1,200	3,382	C
	Parson Avenue	Campus Parkway	2 lane Collector	1,230	C	13,400	**14,630**	**F**
	Campus Parkway	Mission Avenue	2 lane Collector	1,060	C	9,400	10,460	D
SR-99	Childs Avenue	Mission Avenue	6 lane Freeway	40,000	B	19,750	59,750	C
	Mission Avenue	south	6 lane Freeway	40,000	B	6,600	46,600	C

Street	From	To	Classification	Existing Conditions		Existing Plus Project General Plan Circulation		
						Daily Volume		
				Daily Volume	LOS	Added	Total	LOS
Campus Parkway	SR-99	Coffee Street	4 lane Expressway	5,385	C	28,960	34,345	D
	Coffee Street	Central Access	4 lane Expressway	3,490	C	15,940	19,430	C
	Central Access	Pluim Drive	4 lane Expressway	3,490	C	15,940	19,430	C
	Pluim Drive	Gerard Avenue	4 lane Expressway	3,490	C	1,050	4,540	C
	Gerard Avenue	Childs Avenue	4 lane Expressway	2,998	B	700	3,698	C

Table 3.11-14 (cont.): Existing Plus Merced Gateway Daily Traffic Volumes and Level of Service

Street	From	To	Classification	Existing Conditions		Existing Plus Project General Plan Circulation		
						Daily Volume		
				Daily Volume	LOS	Added	Total	LOS
Coffee Street	Childs Avenue	Gerard Avenue	2 lane Collector	2,182	C	1,725	3,907	C
	Parson Avenue	Campus Parkway	2 lane Collector	1,230	C	9,600	10,830	D
	Campus Parkway	Mission Avenue	2 lane Collector	1,060	C	4,875	6,035	D
SR-99	Childs Avenue	Mission Avenue	6 lane Freeway	40,000	B	19,950	59,990	C
	Mission Avenue	south	6 lane Freeway	40,000	B	6,600	46,600	C

Traffic Signal Warrants

Table 3.11-15 summarizes the results of peak-hour signal warrant evaluation for Existing Plus Project volumes. As shown, with access as proposed, the volume of traffic at five locations would reach the level that satisfied warrants during at least one time period. However, three of those locations are "right turn only" driveways where traffic signals would not normally be anticipated.

If the project is developed with General Plan access, then three locations would carry traffic volumes that satisfy traffic signal warrants.

Table 3.11-15: Existing Plus Project Traffic Signal Warrant Status

#	Intersection	Peak Hour Warrant Satisfied?								
		Existing			Ex Plus Project			Ex Plus Project General Plan Streets		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
3	Gerard Ave/Coffee St	N	N	N	N	N	N	N	N	N
4	Gerard Ave/Pluim Dr	N	N	N	N	N	N	N	N	N
9	Coffee Street/Parsons Ave	N	N	N	N	Yes	Yes	N	Yes	Yes
12	Campus Pkwy/Coffee St	N	N	N	Yes	Yes	Yes	Yes	Yes	Yes
13	Coffee St/Mission Ave	N	N	N	N	N	N	N	N	N
14	Gerard Ave/Central Access	—			N	N	N	N	N	N
15	Coffee St/Central Access				N	N	Yes	N	N	N
16	Campus Pkwy/Central Access				N	N	Yes	N	N	N
17	Campus Pkwy/Pluim Drive				N	N	N	Yes	Yes	Yes
18	Coffee St/South Access				N	N	Yes	N	N	N
19	Mission Ave/Central Access				N	N	N	N	N	N
20	Mission Ave/East Access				N	N	N	N	N	N

Impacts and Mitigation Measures

Existing Plus Project

Level of Service Impacts

The Traffic Impact Analysis concludes that without improvements, eight intersections will operate with Levels of Service that exceed the minimum LOS D standard during some time period. Table 3.11-16, and Exhibit 3.11-11 and Exhibit 3.11-12 identified mitigations needed under Existing Plus Project conditions. As summarized in Table 3.11-17, Table 3.11-18, and Table 3.11-19 these mitigations would achieve the LOS D standard under AM and PM peak-hour conditions.

Table 3.11-16: Mitigations for Existing Plus Project Conditions

#	Intersection	Improvements	
		Access As Proposed	General Plan Circulation Alternative
1	Childs Avenue/Parsons Avenue	None	**None**
2	Childs Avenue/Coffee Street	None	None
3	Gerard Avenue/Coffee Street	Enhance Pedestrian Crossing	Enhanced Pedestrian Crossing
4	Gerard Avenue/Pluim Drive	None	None
5	Gerard Avenue/Campus Parkway	None	None
6	Coffee Street/North School Access	None	None
7	Coffee Street/Central School Access	None	None
8	Coffee Street/South School Access	None	None
9	Coffee Street/Parsons Avenue	Traffic signal based on warrants	None
10	Mission Avenue/SB SR-99 ramps	Add 2nd SB left turn lane	Reconfigure SB right turn lane to allow left turns
11	Mission Avenue/NB SR-99 ramps	Add 3rd EB thru lane and make NB right turn lane and WB right turn lane "free"	Make NB right turn lane and WB right turn lane "free"
12	Campus Pkwy/Coffee Street	Traffic signal and add third EB Thru lane, 2nd EB and WB left turn lanes; 3rd WB thru lane and WB right turn lane; 2nd NB left turn lane; separate SB left turn and thru lanes, with overlap phase on SB right turn. Widen Coffee Street north and south of Campus Pkwy to provide two receiving lanes for left turns from Campus Pkwy.	Add Traffic Signal, 2nd EB left turn lane; 3rd WB thru lane. Widen Coffee Street north of Campus Parkway to provide two receiving lanes for left turns.
13	Coffee Street/E. Mission Avenue	None	None
14	Gerard Avenue/Project Access	None	None
15	Coffee Street/Central Access	None	None
16	Campus Parkway/Central Access	None	—

Table 3.11-16 (cont.): Mitigations for Existing Plus Project Conditions

#	Intersection	Improvements	
		Access As Proposed	General Plan Circulation Alternative
17	Campus Parkway/Pluim Drive	None	Add traffic signal and 2nd EB left turn lane; add second NB left turn lane;
18	Coffee Street/South Access	None	None
19	Mission Avenue/Central Access	None	All-Way Stop
20	Mission Avenue/Pluim Drive	None	None
—	Coffee Road from Parsons Avenue to Campus Parkway	4 lane section	None

Table 3.11-17: Mitigated Existing Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	27	C	25	C
2	Childs Avenue/Coffee Street	Signal	17	B	17	C
3	Gerard Avenue/Coffee Street	AWS	7	A	7	A
4	Gerard Avenue/Pluim Drive					
	SB approach	NB/SB Stop	3	A	6	A
	NB approach		2	A	4	A
	EB left turn		1	A	1	A
	WB left turn		1	A	1	A
5	Gerard Avenue/Campus Parkway	Signal	7	A	8	A
6	Coffee Street/North School Access					
	EB approach	EB/WB Stop	0	—	—	A
	WB approach		3	A	3	A
	NB left turn		0	—	2	A
	SB left turn		3	A	3	A
7	Coffee Street/Central School Access					
	EB approach	EB Stop	4	A	5	A
	NB left turn		2	A	0	—
8	Coffee Street/South School Access					
	EB approach	EB Stop	4	A	5	A
9	Coffee Street/Parsons Avenue	AWS	5	A	5	A
10	Mission Avenue/SB SR-99 ramps	Signal	12	B	10	B
11	Mission Avenue/NB SR-99 ramps	Signal	6	A	6	B
12	Campus Parkway/Coffee Street	Signal	30	C	10	B

Table 3.11-17 (cont.): Mitigated Existing Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 3 2	 A A	 4 2	 A A
14	Gerard Avenue/Project Access NB approach WB left	NB Stop	 3 1	 A A	 3 1	 A A
15	Coffee Street/Central Access EB approach	WB Stop	 4	 A	 3	 A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 2	 A A	 —	 —
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	 1 1	 A A	 —	 —
	Overall intersection	Signal	—	—	16	B
18	Coffee Street/South Access WB approach	WB Stop	 14	 B	 2	 A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 3 2	 A A	 15 2	 C A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	 1 1	 A A	 2 3	 A A

Table 3.11-18: Mitigated Existing Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	24	C	23	C
2	Childs Avenue/Coffee Street	Signal	12	B	12	B
3	Gerard Avenue/Coffee Street	AWS	5	A	6	A
4	Gerard Avenue/Pluim Drive					
	SB approach	NB/SB Stop	2	A	5	A
	NB approach		3	A	6	A
	EB left turn		1	A	1	A
	WB left turn		1	A	1	A
5	Gerard Avenue/Campus Parkway	Signal	7	A	9	A
6	Coffee Street/North School Access					
	EB approach	EB/WB Stop	5	A	4	A
	WB approach		2	A	1	A
	NB left turn		0	—	0	—
	SB left turn		2	A	2	A
7	Coffee Street/Central School Access					
	EB approach	EB Stop	4	A	4	A
	NB left turn		0	—	0	—
8	Coffee Street/South School Access	EB Stop				
	EB approach		4	A	4	A
9	Coffee Street/Parsons Avenue	AWS	6	A	7	A
10	Mission Avenue/SB SR-99 ramps	Signal	13	B	11	B
11	Mission Avenue/NB SR-99 ramps	Signal	6	A	7	B
12	Campus Parkway/Coffee Street	Signal	35	D	12	D

Table 3.11-18 (cont.): Mitigated Existing Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 3 1	 A A	 4 2	 A A
14	Gerard Avenue/Project Access NB approach WB left	NB Stop	 4 1	 A A	 3 1	 A A
15	Coffee Street/Central Access EB approach	WB Stop	 9	 A	 5	 A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 5	 A A	 —	 —
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	 1 2	 A A	 —	 —
	—	Signal	—	—	27	C
18	Coffee Street/South Access WB approach	WB Stop	 9	 A	 2	 A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 3 2	 A A	 13 3	 B A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	 1 1	 A A	 2 3	 A A

Table 3.11-19: Mitigated Existing Plus Project Conditions—Saturday

#	Intersection	Control	Saturday Peak Hour			
			Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	23	C	22	B
2	Childs Avenue/Coffee Street	Signal	11	B	10	B
3	Gerard Avenue/Coffee Street	AWS	5	A	5	A
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 3 3 1 1	 A A A A	 6 6 1 1	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	7	A	8	A
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 5 1 0 1	 A — A	 0 1 0 3	 — A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 0 0	 — —	 0 0	 — —
8	Coffee Street/South School Access EB approach	EB Stop	 2	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	8	A	9	A
10	Mission Avenue/SB SR-99 ramps	Signal	20	B	17	C
11	Mission Avenue/NB SR-99 ramps	Signal	49	D	24	D
12	Campus Parkway/Coffee Street	Signal	**78**	**E**	44	D

Table 3.11-19 (cont.): Mitigated Existing Plus Project Conditions—Saturday

#	Intersection	Control	Saturday Peak Hour			
			Existing Plus Project		Existing Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 4 1	 A A	 9 25	 A D
14	Gerard Avenue/Project Access B approach B left	NB Stop	 4 3	 A A	 3 2	 A A
15	Coffee Street/Central Access EB approach	WB Stop	 11	 B	 6	 A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 **36**	 A **E**	 —	 —
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	 1 2	 A A	 —	 —
	—	Signal	—	—	31	C
18	Coffee Street/South Access WB approach	WB Stop	 **82**	 **F**	 2	 A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 3 2	 A A	 —	 —
—	—	AWS	—	—	16	C
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	 1 1	 A A	 2 4	 A A

Three locations would operate with Level of service in excess of LOS D in the Saturday peak hour. These improvements would yield LOS E at the Campus Parkway/Coffee Street intersection (12) during the Saturday peak hour, and further improvements do not appear feasible. The Campus Parkway/Central Access intersection (16) is projected to operate at LOS E. Review of simulation results indicate that these conditions relate to the delay experienced by motorists waiting for a gap in traffic in order to cross through traffic to reach the westbound left turn lane at the Coffee Street intersection. While it is likely that some motorists could elect to use the eastern access rather than wait at this location and that diversion would improve the Level of service, no physical improvement to deliver LOS D is feasible. The project access on south Coffee Street (18) would operate at LOS F, even though this location is limited to right turns only. Measures to reduce delay at this driveway would involve traffic controls on northbound Coffee Street, such as traffic signals, which are not feasible at this location. The project access on the south Coffee Street (18) would operate at LOS F, even though this location is limited to right turns only. Measures to reduce delay at this driveway would involve traffic controls on northbound Coffee Street, such as traffic signals, which are not feasible at this location.

Existing Plus Project With General Plan Access

Level of Service Impacts

The Traffic Impact Analysis concludes that without improvements, six intersections will operate with Levels of Service that exceed the minimum LOS D standard during some time period. Table 3.11-15 and Exhibit 3.11-13 and 3.11-14 identify mitigations needed under Existing Plus Project conditions with General Plan Access. As was summarized in Table 3.11-17, Table 3.11-18, and Table 3.11-19, these mitigations would achieve the LOS D standard under AM, PM, and SAT peak-hour conditions.

Conclusion

The proposed project would contribute new trips to intersection and roadway segments that would operate at unacceptable levels during Existing Plus Project conditions. Feasible mitigation measures are proposed that would improve operations at most—but not all—facilities. Additionally, certain facilities are outside the jurisdictional control of the City of Merced, and, therefore, uncertainty exists regarding whether the improvements would be implemented as contemplated. For these reasons, the residual significance of this impact is significant and unavoidable.

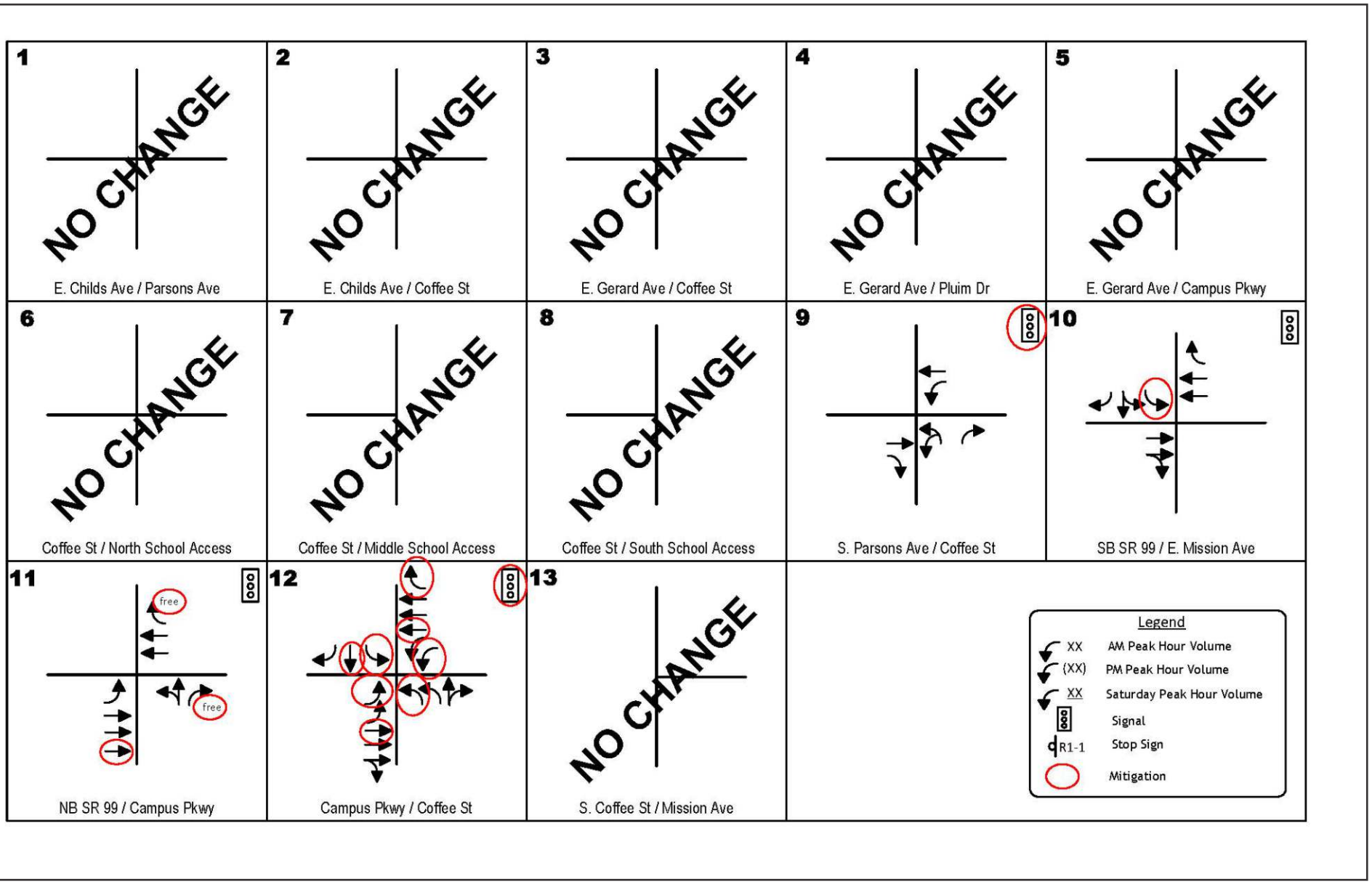
Level of Significance Before Mitigation

Potentially significant impact

Mitigation Measures

MM TRANS-1a In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Gerard Avenue/Coffee Street (3) with an enhanced pedestrian crossing.

MM TRANS-1b In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the segment of Coffee Road from Parsons Avenue to Campus parkway to a four-lane roadway. The improved roadway shall be designed and constructed in accordance with City of Merced engineering standards.

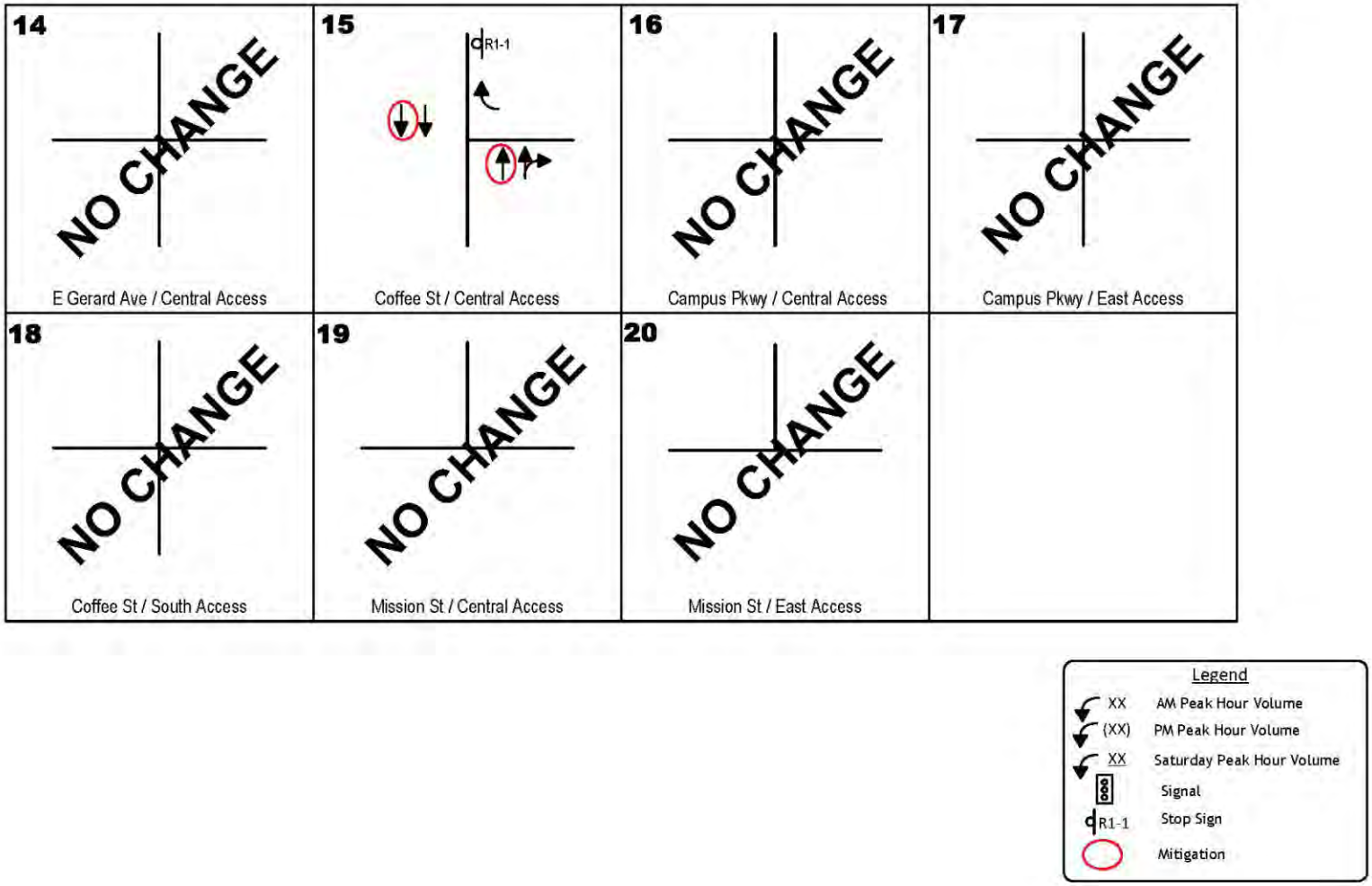


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-11
Mitigations Existing Plus Project / Access as Proposed Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

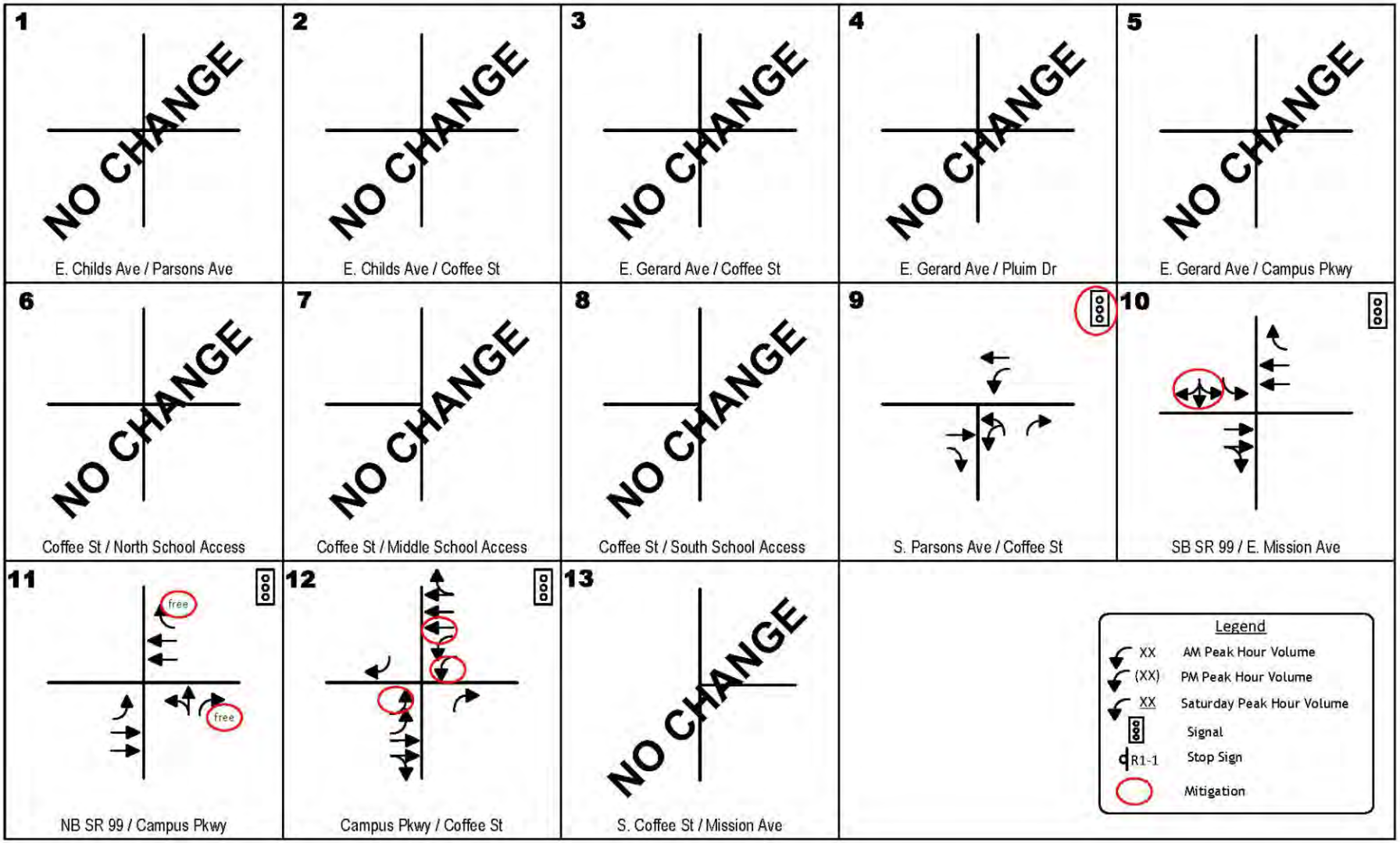


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-12
Mitigations Existing Plus Project / Access
as Proposed Traffic Volumes Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

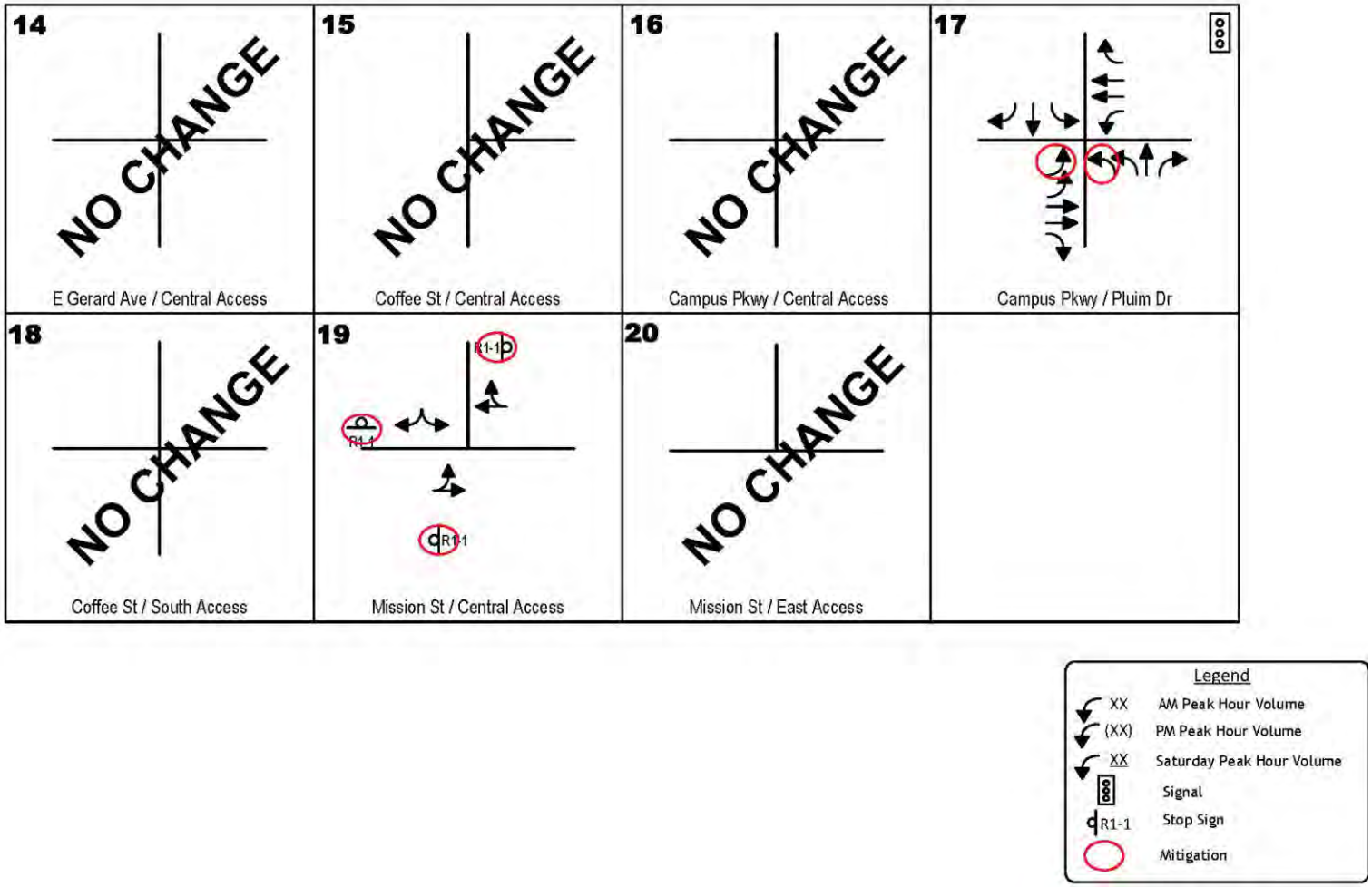


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-13
Mitigations Existing Plus Project with General Plan Streets Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-14
Mitigations Existing Plus Project with General Plan Streets Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

MM TRANS-1c In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Coffee Street/Parsons Avenue (9). The intersection shall be improved with a traffic signal.

MM TRANS-1d In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Mission Avenue/Southbound SR-99 Ramps (10). The intersection shall be improved with a second southbound left turn lane by reconfiguring the existing right turn lane to become a left-turn/right-turn lane.

MM TRANS-1e In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Mission Avenue/Northbound SR-99 Ramps (11). The intersection shall be improved by adding a third eastbound through lane and converting the northbound right turn lane and westbound right turn lane to "free" right turn lanes.

MM TRANS-1f In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Campus Parkway/Coffee Street (12). The intersection shall be improved with a signal, a third eastbound through lane, a second eastbound left turn lane and westbound left turn lane, a third westbound through lane, a westbound right turn lane, a second northbound left turn lane, and separate southbound left turn and through lanes, with overlap phase on southbound right turn. Coffee Street shall be widened north and south of Campus Parkway to provide two receiving lanes for left turns from Campus Parkway.

MM TRANS-1g A transportation improvement phasing plan shall be prepared by the City of Merced as a part of the Merced Gateway Planned Development Master Plan. The transportation improvement phasing plan shall specify, based on vehicle trip generation volumes or other accepted metric, when intersection, road segment, alternative transportation improvements, or other transportation improvements shall be implemented in order to ensure acceptable levels of service at each affected intersection or roadway segment. The plan will also indicate the costs, fair-share or otherwise, of the improvement to be borne by the applicant.

Level of Significance After Mitigation

Significant unavoidable impact: Campus Parkway/Coffee Street (12), Campus Parkway/Central Access (16), Coffee Street/South Access (18).

Less than significant impact: Coffee Street between Parsons Avenue and Campus Parkway (segment), Coffee Street/Parsons Avenue (9), Mission Ave/SB SR-99 ramps (10), Mission Ave/NB SR-99 ramps (11), and Mission Avenue/Central access (19).

Existing Plus Approved Projects Plus Project Traffic

Impact TRANS-2: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing Plus Approved Projects Plus Project Conditions.

Impact Analysis

The analysis of the near term conditions is intended to consider the impact of the project within the context of the "Existing Plus Approved Projects" (EPAP) conditions. The City's traffic impact protocols assume all existing improvement and development commitments in the project vicinity are completed.

Land Use Assumptions

Approved projects in the vicinity of the project site were identified by City staff. These projects are listed in Table 3.11-20 along with their respective trip generation estimates.

For those projects that were the subject of a prior traffic analysis, the trip generation estimates made previously were employed. Institute of Transportation Engineers (ITE) rates were employed for those projects without a traffic study. In the case of retail uses, the net new trips associated with that project are noted.

As indicated, the identified approved projects would be expected to generate 20,143 daily trips, with 1,344 trips generated in the AM peak hour, 2,557 trips occurring in the PM peak hour, and 2,313 trips generated in the peak Saturday hour.

This analysis considers the impacts of the project within the context of the short-term future traffic volumes accompanying other approved projects, as was described previously.

Trip Distribution Assumptions

The trips associated with approved projects were assigned to the study area street system, as indicated in Tables 7, 8, 9, and 10 in the Traffic Impact Analysis and shown in Exhibit 3.11-15. The distribution assumptions made for the Walmart Distribution center were taken from that project's DEIR. The assumptions made for the Steiner GPA and approved residential projects were taken from review of MCAG regional travel demand model select zone analysis based on daily volumes.

Traffic Volumes

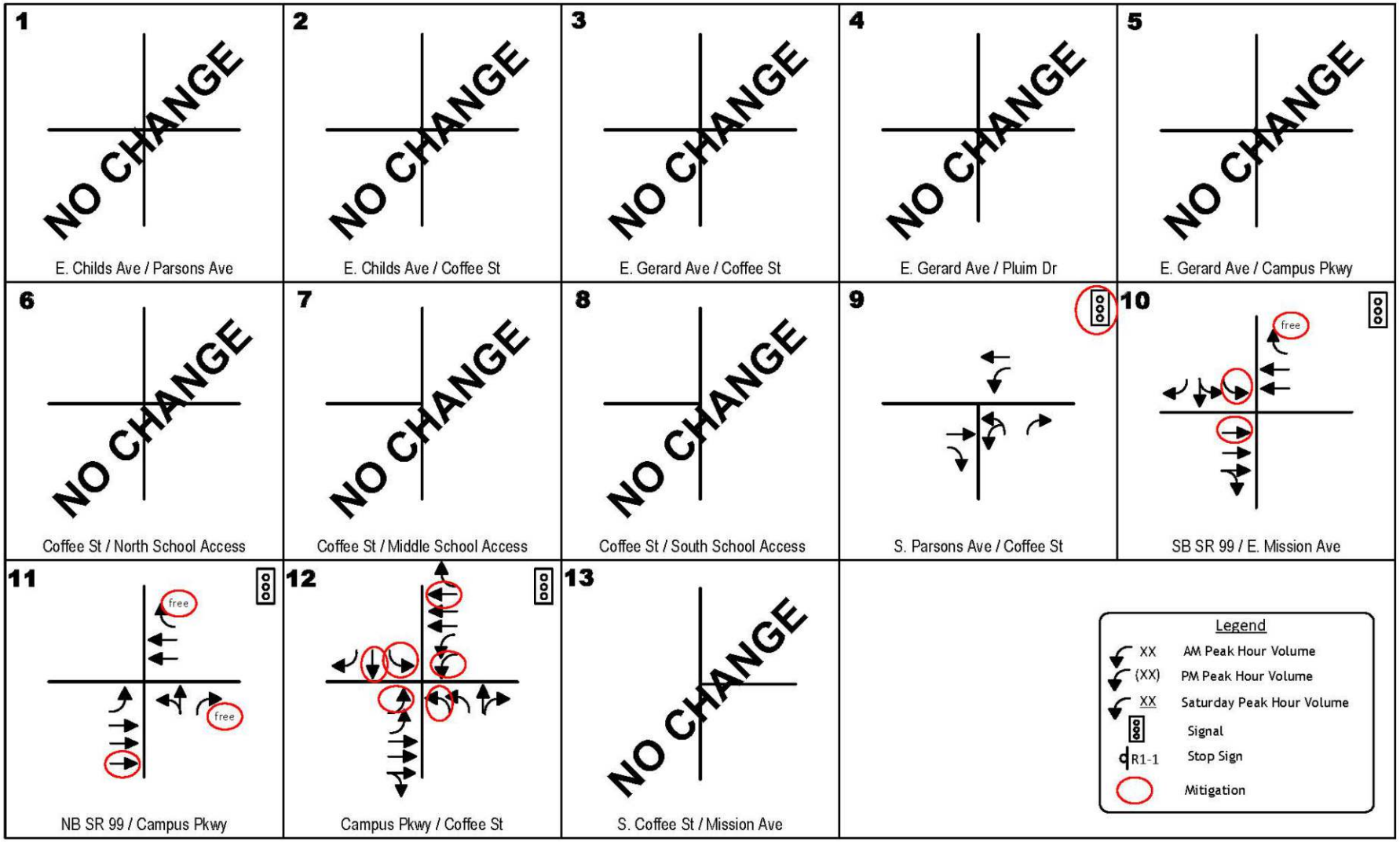
EPAP plus Project traffic volumes were created by superimposing project traffic onto the EPAP baseline condition identified earlier. Exhibit 3.11-16 and Exhibit 3.11-17 identify resulting AM, PM, and Saturday traffic volumes. The resulting intersection levels of service are shown in Table 3.11-21 and Table 3.11-22.

Table 3.11-20: Approved Projects

Name	Description	Location	Trip Generation			
			Daily	AM Peak Hour	PM Peak Hour	Saturday Peak Hour
Towne Place Suites	97 unit hotel	Parsons Ave south of Childs Ave	776	58	52	61
(30) Sierra Vista Sub	74 vacant lots	North of Childs Ave east of Coffee St	704	56	704	69
(31) Renaissance II	158 vacant lots	North of Childs Ave east of Coffee St	1,504	119	158	147
(32) The Crossings at River Oaks	277 vacant lots	South of Childs Ave and east of Coffee St	2,637	208	277	258
(33) Hartley Crossings	22 vacant lots	South of Childs Ave and west of Coffee St	209	17	22	20
(36) Tuscany East	47 vacant lots	North of Childs Ave and east of Coffee St	447	35	47	44
(64) Summerfield	252 vacant lots	South of Childs Ave and west of Coffee St	2,399	189	252	234
Walmart Distribution Center[1]	—	North of Gerard Ave and east of Campus Pkwy	2,399	143	328	328*
Steiner GPA—North[2]	19.5 acre retail center	West of Coffee St and south of Parsons Ave	7,507	321	609	867
Steiner GPA—South[2]	7.8 acre retail center	West of Coffee St and south of Campus Pkwy	2,337	198	108	285
Total			**20,919**	**1,344**	**2,557**	**2,313**

Notes:
* Saturday peak hour assumed to be equal to weekday PM peak hour
1 trip generation estimate from Walmart DEIR Traffic Impact Analysis
2 trip generation estimate from Initial Study
Source: KD Anderson & Associates, Inc., 2016.

THIS PAGE INTENTIONALLY LEFT BLANK

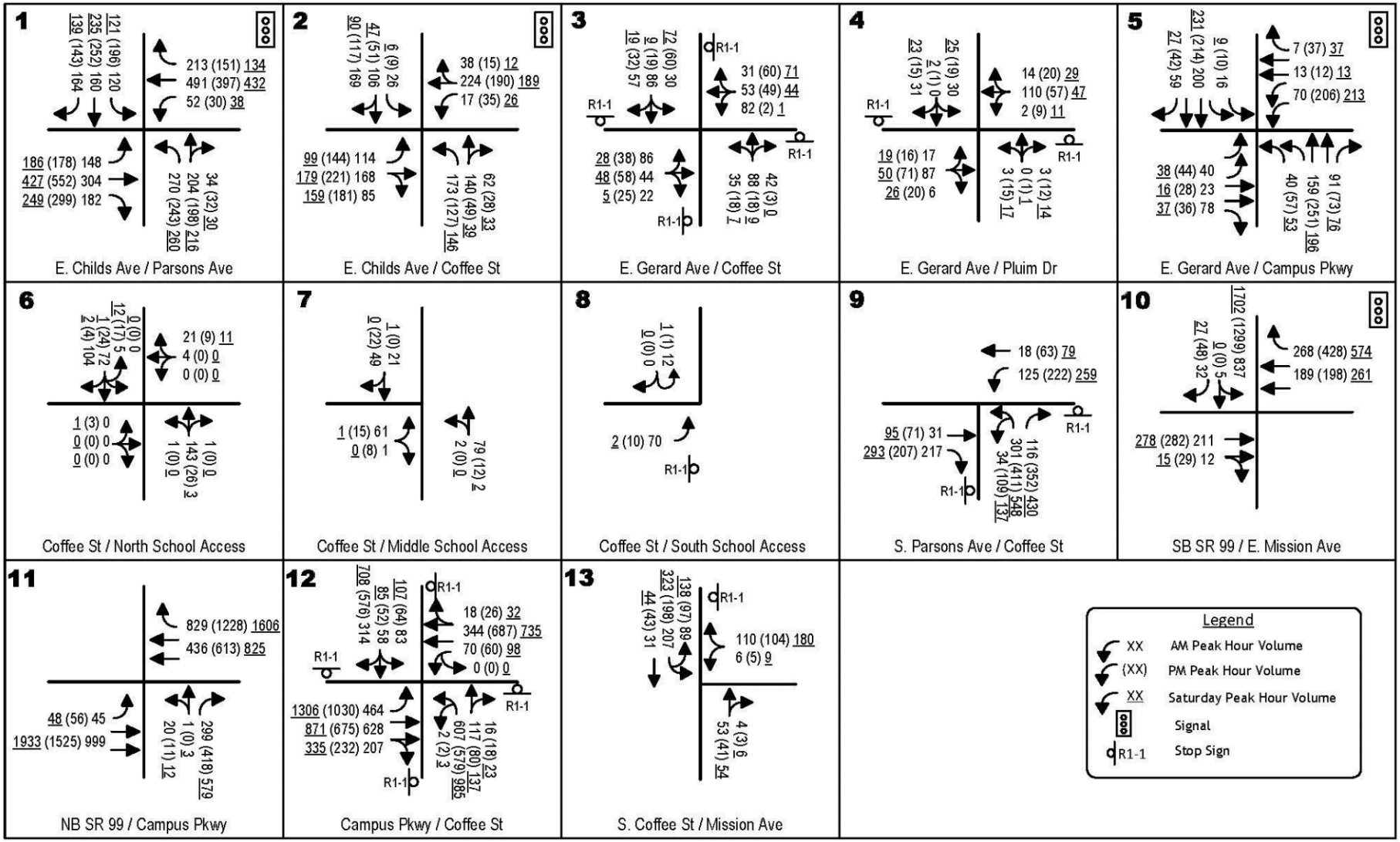


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-15
Existing plus Approved Projects (EPAP) Peak Hour Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

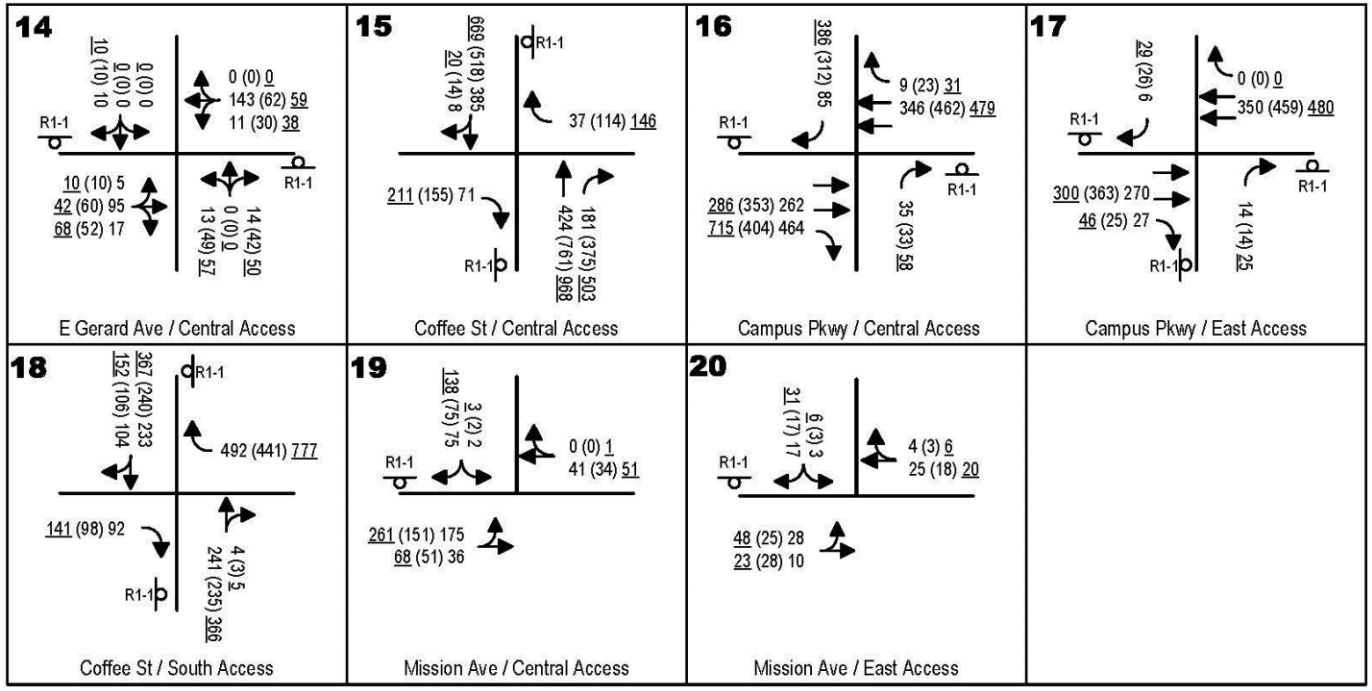


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-16
Existing Plus Approved Projects (EPAP) Plus Project Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-17
Existing Plus Approved Projects (EPAP) Plus Project Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

Table 3.11-21: Peak Hour Intersection Levels of Service Existing Plus Approved Projects (EPAP) Conditions

#	Intersection	Control	AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	**61**	**E**	31	C	28	C
2	Childs Avenue/Coffee Street	Signal	21	B	19	C	16	B
3	Gerard Avenue/Coffee Street	AWS	6	A	4	A	3	A
4	Gerard Avenue/Pluim Drive SB approach EB left turn	SB Stop	 4 3	 B A	 4 3	 A A	 3 1	 A A
5	Gerard Avenue/Campus Parkway	Signal	9	A	12	B	10	B
6	Coffee Street/North School Access EB approach NB left turn	EB Stop	 0 0	 A —	 4 0	 A —	 3 0	 A —
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 4 2	 A A	 4 0	 A —	 3 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 4	 A	 4	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	5	A	5	A	6	A
10	Mission Avenue/SB SR-99 ramps	Signal	7	A	8	A	8	A
11	Mission Avenue/NB SR-99 ramps	Signal	6	A	6	A	6	A
12	Campus Parkway/Coffee Street	AWS	10	B	16	B	26	D
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 3 2	 A A	 3 3	 A A	 3 2	 A A

Source: KD Anderson & Associates, Inc., 2016.

Table 3.11-22: Existing Plus Approved Projects Daily Traffic Volumes and Level of Service

Street	From	To	Classification	Existing Conditions		Existing Plus Approved Projects		
						Daily Volume		
				Daily Volume	LOS	Added	Total	LOS
Campus Parkway	SR-99	Coffee Street	4 lane Expressway	5,385	C	10,110	15,495	C
	Coffee Street	Gerard Avenue	4 lane Expressway	3,490	C	3,400	5,890	C
	Gerard Avenue	Childs Avenue	4 lane Expressway	2,998	B	1,875	4,873	C
Coffee Street	Childs Avenue	Gerard Avenue	2 lane Collector	2,182	C	2.240	4,422	C
SR-99	Childs Avenue	Mission Avenue	6 lane Freeway	40,000	B	6,400	46,400	C
	Mission Avenue	South	6 lane Freeway	40,000	B	3,200	43,200	C

Source: KD Anderson & Associates, Inc., 2016.

Impacts and Mitigation Measures

Existing Plus Approved Projects

With one exception, all intersections will operate at LOS D or better when identified background projects are occupied as shown in Table 3.11-21. The Childs Avenue/Parsons Avenue intersection will operate at LOS E during the AM peak hour.

Recommended Improvements

Because the area around the Childs Avenue/Parsons Avenue intersection is generally built out, alternatives for increasing the capacity of the intersection are limited. Reconfiguring the eastbound approach to allow left turns from the through lane is an option, but would not appreciably improve conditions during this time period.

All other study area roadway segments carry daily traffic volumes that are indicative of LOS C conditions, and no improvements are needed.

Existing Plus Approved Projects Plus Merced Gateway Access as Proposed

Level of Service Impacts

The Traffic Impact Analysis concludes that without improvements, nine intersections will operate with Levels of Service that exceed the minimum LOS D standard during some time period. Tables 3.11-23, 3.11-24, and 3.11-25 show the resulting intersection levels of service from the addition of the project's traffic to the existing plus approved projects (EPAP) condition. Table 3.11-26 shows the traffic signal warrants status for the EPAP plus the Merced Gateway Project condition. Five locations carry volumes that reach the level that satisfy signal warrants. However, three are "right turn only" locations that would not normally require signalization. Table 3.11-27 shows the effect of the EPAP plus Project traffic volumes on the level of service for roadway segments in the project area. Coffee Street will have an LOS of F between Parsons Avenue and Campus Parkway and LOS of E between Campus Parkway and Mission Avenue.

Table 3.11-28, Exhibit 3.11-18, and Exhibit 3.11-19 identify mitigations needed under EPAP Plus Project conditions with access as proposed. As is summarized in Table 3.11-29, these mitigations would achieve the LOS D standard at several locations. However, six locations would remain deficient after implementation of feasible improvements.

The identified improvements would still result in LOS F at the Coffee Street/Central Access intersection (15) on Saturday peak hour. This location is a right turn only, and further improvement is not feasible as all-way stop control and traffic signalization cannot be installed near the Coffee Street/Campus Parkway intersection. Similarly, the Coffee Street/South Access intersection (18) is projected to operate at LOS F in the AM, PM, and Saturday peak hours. This location is a right turn only, and further improvement is not feasible as all-way stop control and traffic signalization cannot be installed near the Coffee Street/Campus Parkway intersection. The SR99 SB Ramps (10) and NB Ramps (11), and the Coffee Street/Campus parkway (12) intersection would all remain in an LOS F condition. No identified improvement would change the LOS at the Childs Avenue/Parsons Avenue intersection (1), so it would remain at LOS F in the AM peak hour.

Roadway Segment Impacts. The segment of Coffee Road from Parsons Avenue to Campus Parkway will need to be improved to a four-lane section to deliver LOS D or better conditions and to accommodate the intersection geometry prescribed for the Campus Parkway/Coffee Street and Coffee Street/Parsons Avenue intersections.

Table 3.11-23: EPAP Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	**61**	**F**	**101**	**F**
2	Childs Avenue/Coffee Street	Signal	21	C	23	C
3	Gerard Avenue/Coffee Street	AWS	6	A	6	A
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 4 2 3 0	 A A A A	 5 4 1 2	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	9	A	9	A
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 0 — 0 —	 — A — A	 0 4 0 3	 — A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 4 2	 A A	 4 3	 A A
8	Coffee Street/South School Access EB approach	EB Stop	 4	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	5	A	**125**	**F**
10	Mission Avenue/SB SR-99 ramps	Signal	7	A	**149**	**F**
11	Mission Avenue/NB SR-99 ramps	Signal	6	A	**128**	**F**
12	Campus Parkway/Coffee Street	AWS	10	B	**140**	**F**
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 3 2	 A A	 3 2	 A A
14	Gerard Avenue/Project Access NB approach SB approach EB left WB left	NB/SB Stop	 —	 —	 4 3 3 1	 A A A A

Table 3.11-23 (cont.): EPAP Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
15	Coffee Street/Central Access WB approach EB approach	EB/WB Stop	—	—	**89** **404**	**FA** **F**
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	—	—	1 3	A A
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	—	—	1 3	A A
18	Coffee Street/South Access EB approach WB approach	EB/WB Stop	—	—	5 **218**	A **F**
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	—	—	1 2	A A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	—	—	2 2	A A

Table 3.11-24: EPAP Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	31	C	**57**	**E**
2	Childs Avenue/Coffee Street	Signal	19	B	**21**	**C**
3	Gerard Avenue/Coffee Street	AWS	4	A	4	A
4	Gerard Avenue/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	— 4 3 —	— A A —	4 4 1 1	A A A A
5	Gerard Avenue/Campus Parkway	Signal	12	B	20	B

Table 3.11-24 (cont.): EPAP Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/SB Stop	 4 — 0 —	 A — — —	 5 2 0 2	 A A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 4 0	 A —	 4 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 4	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	5	A	**397**	**F**
10	Mission Avenue/SB SR-99 ramps	Signal	8	A	**888**	**F**
11	Mission Avenue/NB SR-99 ramps	Signal	6	A	**151**	**F**
12	Campus Parkway/Coffee Street	AWS	16	C	**194**	**F**
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 3 3	 A A	 3 2	 A A
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left	NB Stop	—	—	 4 2 4 A	 A A A A
15	Coffee Street/Central Access EB Approach WB approach	EB/WB Stop	—	—	 **596** **372**	 **F** **F**
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	—	—	 1 **160**	 A **F**
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	—	—	 2 14	 A B
18	Coffee Street/South Access WB approach	WB Stop	—	—	 **203**	 **F**
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	—	—	 1 2	 A C

Table 3.11-24 (cont.): EPAP Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	— 	— 	 0 4	 A A

Table 3.11-25: EPAP Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	28	C	**59**	**E**
2	Childs Avenue/Coffee Street	Signal	16	B	18	B
3	Gerard Avenue/Coffee Street	AWS	3	A	4	A
4	Gerard Avenue/Pluim Drive NB Approach SB approach EB left turn WB left turn	NB/SB Stop	 — 3 1 —	 — A A —	 2 4 1 1	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	10	B	29	C
6	Coffee Street/North School Access EB Approach WB Approach NB left turn SB left turn	EB/WB Stop	 3 — 0 —	 A — — —	 0 3 0 3	 — A — A
7	Coffee Street/Central School Access EB Approach NB left turn	EB Stop	 3 0	 A —	 4 0	 — —
8	Coffee Street/South School Access EB Approach	EB Stop	 4	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	6	A	**701**	**F**
10	Mission Avenue/SB SR-99 ramps	Signal	8	A	**973**	**F**
11	Mission Avenue/NB SR-99 ramps	Signal	6	A	**164**	**F**
12	Campus Parkway/Coffee Street	AWS	26	D	**201**	**F**

Table 3.11-25 (cont.): EPAP Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 3 1	 A A	 21 12	 C B
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	—	—	 4 3 3 2	 A A A A
15	Coffee Street/Central Access EB approach WB approach	EB/WB Stop	—	—	 **821** **269**	 **F** **F**
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	—	—	 1 **232**	 A **F**
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	—	—	 1 **126**	 A **F**
18	Coffee Street/South Access WB approach	WB Stop	—	—	 **289**	 **F**
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	—	—	 1 2	 A A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	—	—	 2 2	 A A

Table 3.11-26: Existing Plus Approved Projects Traffic Signal Warrants Status

#	Intersection	Peak Hour Warrant Satisfied?					
		Existing Plus Approved Projects			EPAP Plus Project		
		AM	PM	Saturday	AM	PM	Saturday
3	Gerard Ave/Coffee St	N	N	N	N	N	N
4	Gerard Ave/Pluim Dr	N	N	N	N	N	N
9	Parsons Ave/Coffee St	N	N	N	N	Yes	Yes
12	Campus Pkwy/Coffee St	N	N	Yes	Yes	Yes	Yes

Table 3.11-26 (cont.): Existing Plus Approved Projects Traffic Signal Warrants Status

#	Intersection	Peak Hour Warrant Satisfied?					
		Existing Plus Approved Projects			EPAP Plus Project		
		AM	PM	Saturday	AM	PM	Saturday
13	S Coffee St/Mission Ave	N	N	N	N	N	N
14	Gerard Ave/Central Access	—			N	N	N
15	Coffee St/Central Access				N	Yes	Yes
16	Campus Pkwy/Central Access				N	Yes	Yes
17	Campus Pkwy/East Access				N	N	N
18	Coffee St/South Access				Yes	Yes	Yes
19	Mission Ave/Central Access				N	N	N
20	Mission Ave/East Access				N	N	N

Table 3.11-27: EPAP Plus Project Daily Traffic Volumes and Level of Service

Street	From	To	Classification	EPAP Conditions		EPAP Plus Proposed Project		
						Daily Volume		
				Daily Volume	LOS	Added	Total	LOS
Campus Parkway	SR-99	Coffee Street	4 lane Expressway	15,385	C	29,920	**45,415**	**F**
	Coffee Street	Central Access	4 lane Expressway	6,965	C	9,220	15,110	C
	Central Access	Pluim Drive	4 lane Expressway	6,965	C	1,200	7,090	C
	Pluim Drive	Gerard Avenue	4 lane Expressway	6,965	C	1,230	7,120	C
	Gerard Avenue	Childs Avenue	4 lane Expressway	4,923	C	1,875	4,873	C
Coffee Street	Childs Avenue	Gerard Avenue	2 lane Collector	4,422	C	2,230	6,6522	C
	Parsons Avenue	Campus Parkway	2 lane Collector	7,780	D	13,400	**21,180**	**F**
	Campus Parkway	Mission Avenue	2 lane Collector	3,610	C	9,400	**13,010**	**E**
SR-99	Childs Avenue	Mission Avenue	6 lane Freeway	46,400	C	19,750	66,150	C
	Mission Avenue	South	6 lane Freeway	43,200	C	7,780	50,980	C

Table 3.11-28: Mitigations for EPAP Plus Project Conditions

#	Intersection	Improvements	
		Existing Plus Approved Projects	EPAP Plus Merced Gateway
1	Childs Avenue/Parsons Avenue	None	None
2	Childs Avenue/Coffee Street	None	None
3	Gerard Avenue/Coffee Street	None	None
4	Gerard Avenue/Pluim Drive	None	None
5	Gerard Avenue/Campus Parkway	None	None

Table 3.11-28 (cont.): Mitigations for EPAP Plus Project Conditions

#	Intersection	Improvements	
		Existing Plus Approved Projects	EPAP Plus Merced Gateway
6	Coffee Street/North School Access	None	None
7	Coffee Street/Central School Access	None	None
8	Coffee Street/South School Access	None	None
9	Coffee Street/Parsons Avenue	None	Traffic signal
10	Mission Avenue/SB SR-99 ramps	None	Add 2nd SB left turn lane, 3rd EB thru lane and "free" WB right turn lane
11	Mission Avenue/NB SR-99 ramps	None	Add 3rd EB thru lane and make NB right turn lane and WB right turn lane "free"
12	Campus Parkway/Coffee Street	Signal based on warrants	Traffic signal and add third EB Thru lane, 2nd EB left turn lane; 3rd WB thru lane and WB right turn lane; 2nd NB left turn lane; separate SB left turn and thru lanes, with overlap phase on SB right turn. Widen Coffee Street north and south of the intersection to provide two receiving lanes for left turns
13	Coffee Street/E. Mission Avenue	None	Accommodate SB to NB U-turns
14	Gerard Avenue/Project Access	None	None
15	Coffee Street/Central Access	None	None
16	Campus Parkway/Central Access	None	None
17	Campus Parkway/Pluim Drive	None	None
18	Coffee Street/South Access	None	None
19	Mission Avenue/Central Access	None	None
20	Mission Avenue/Pluim Drive	None	None
—	Campus Parkway from SR 99 to Coffee	None	Six lane section
—	Coffee Street from Parsons Avenue to Campus Parkway	None	Four lane section

Table 3.11-28 (cont.): Mitigations for EPAP Plus Project Conditions

#	Intersection	Improvements	
		Existing Plus Approved Projects	EPAP Plus Merced Gateway
—	Coffee Street: Campus Parkway to Mission Avenue	None	Four lane section

Table 3.11-29: Mitigated EPAP Plus Project Conditions

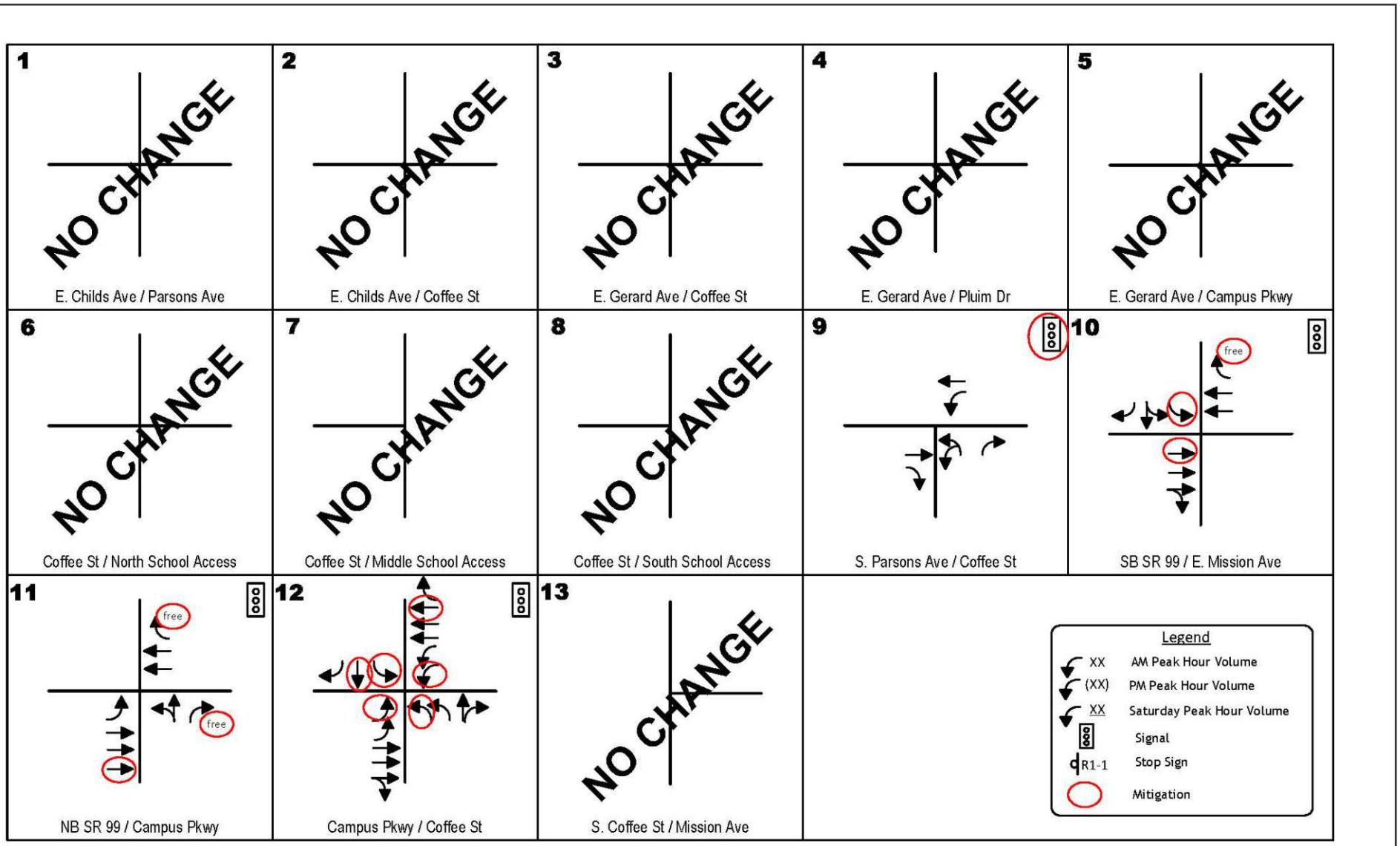
#	Intersection	Control	EPAP Plus Project					
			AM Peak Hour		PM Peak Hour		Saturday	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	**98**	**F**	44	D	39	D
2	Childs Avenue/Coffee Street	Signal	22	C	20	C	18	C
3	Gerard Avenue/Coffee Street	AWS	6	A	4	A	4	A
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 4 4 1 1	 A A A A	 4 4 1 1	 A A A A	 4 4 2 1	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	9	A	12	B	11	B
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 0 3 4 4	 — A A A	 3 3 0 2	 A A — A	 4 2 0 3	 A A — A

Table 3.11-29 (cont.): Mitigated EPAP Plus Project Conditions

#	Intersection	Control	EPAP Plus Project					
			AM Peak Hour		PM Peak Hour		Saturday	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 4 4	 A A	 4 0	 A —	 6 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 5	 A	 4	 A	 5	 A
9	Coffee Street/Parsons Avenue	Signal	17	B	17	B	21	C
10	Mission Avenue/SB SR-99 ramps	Signal	12	B	46	D	**134**	**F**
11	Mission Avenue/NB SR-99 ramps	Signal	8	A	**68**	**E**	**131**	**F**
12	Campus Parkway/Coffee Street	AWS	47	D	**83**	**F**	**104**	**F**
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 4 3	 A A	 4 2	 A A	 5 3	 A A
14	Gerard Avenue/Project Access NB approach SB approach EB left WB left	NB/SB Stop	 4 3 3 1	 A A A A	 5 3 3 2	 A A A A	 5 3 3 2	 A A A A
15	Coffee Street/Central Access WB approach EB approach	EB/WB Stop	 5 5	 A A	 9 8	 A A	 14 **292**	 B **F**
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 1 3	 A A	 1 5	 A A	 1 8	 A A

Table 3.11-29 (cont.): Mitigated EPAP Plus Project Conditions

#	Intersection	Control	EPAP Plus Project					
			AM Peak Hour		PM Peak Hour		Saturday	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
17	Campus Parkway/East Access							
	NB approach	NB/SB Stop	1	A	2	A	1	A
	SB approach		3	A	3	A	3	A
18	Coffee Street/South Access							
	EB approach	EB/WB Stop	4	A	4	A	5	A
	WB approach		**53**	**F**	**92**	**F**	**417**	**F**
19	Mission Avenue/Central Access							
	SB approach	SB Stop	1		1	A	1	A
	EB left turn		2	A	2	A	2	A
20	Mission Avenue/Pluim Drive							
	SB approach	SB Stop	2	A	0	A	2	A
	EB left turn		2	A	5	A	2	A

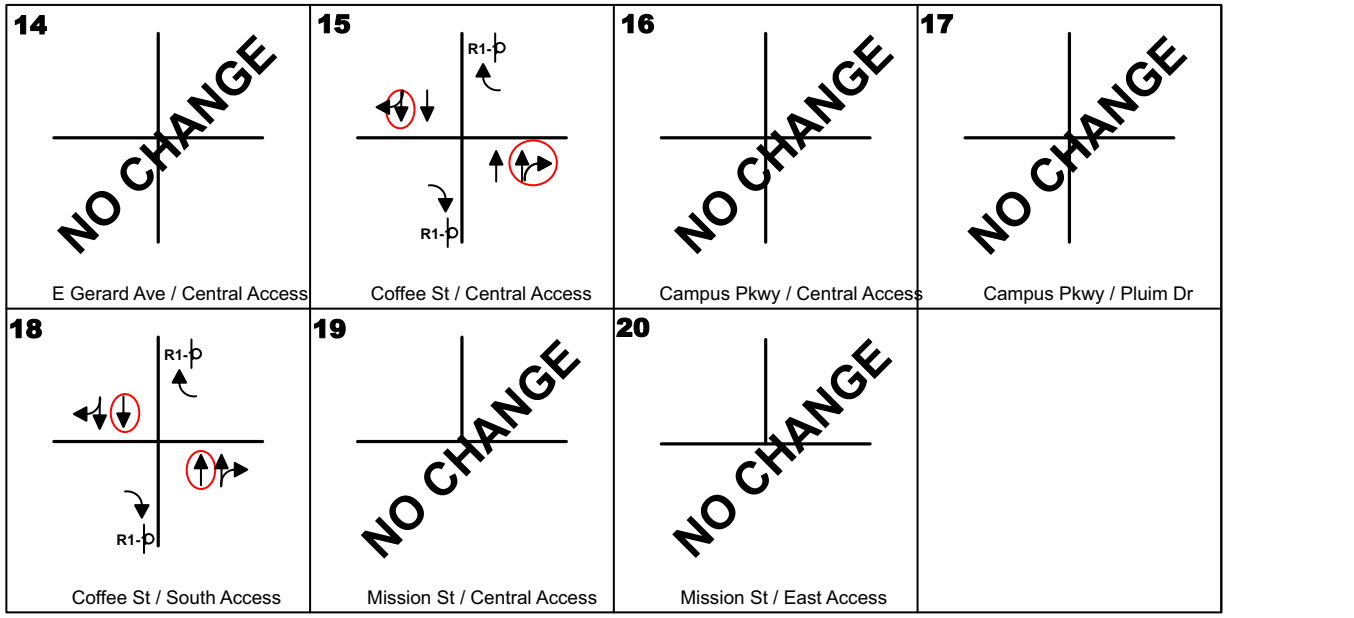


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-18
Mitigations Existing Plus Approved Projects (EPAP)
Plus Project / Access as Proposed Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-19
Mitigations Existing Plus Approved Projects (EPAP) Plus Project / Access as Proposed Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

The segment of Coffee Street from Campus Parkway to Mission Street would require similar treatment (i.e., four lanes).

The identified improvements would create three lanes in each direction on Campus Parkway between SR-99 and Coffee Street, and the resulting Level of Service on this segment would be LOS C.

Conclusion

The proposed project would contribute new trips to intersection and roadway segments that would operate at unacceptable levels during Existing Plus Approved Projects Plus Project conditions. Feasible mitigation measures are proposed that would improve operations at some—but not all—facilities. Additionally, certain facilities are outside the jurisdictional control of the City of Merced, and, therefore, uncertainty exists regarding whether the improvements would be implemented as contemplated. For these reasons, the residual significance of this impact is significant and unavoidable.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measures TRANS-1a, TRANS-1b, TRANS-1c, TRANS-1d, TRANS-1e, TRANS-1f, TRANS-1g, and:

MM TRANS-2 In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the project applicant shall improve the intersection of Mission Avenue/Southbound SR-99 Ramps (10) with a third eastbound through lane and converting the westbound right turn lane to a "free" right turn, and the segment of Mission Avenue between the ramps and Coffee shall be widened to 6 lanes total. The applicant shall be responsible for its proportional cost of the improvement.

Level of Significance After Mitigation

Significant unavoidable impact: Childs Avenue/Parsons Avenue (1), Campus Parkway/Coffee Street (12), Mission Ave/SB SR-99 ramps (10), Mission Ave/NB SR-99 ramps (11), Coffee Street/Central Access (15), and Coffee Street/South Access (18).

Less than significant impact: Coffee Street/Parsons Avenue (9), Campus Parkway/Central access (16), and Campus Parkway/Pluim Drive (17).

Cumulative Traffic

Impact TRANS-3: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Cumulative Conditions.

Impact Analysis

The cumulative Year 2035 analysis presented herein is intended to evaluate the relative difference in long-term traffic conditions under the two access alternatives, assuming implementation of long-

term circulation system improvements and continuing development in the Merced area. The MCAG regional travel demand forecasting model is the tool employed for this analysis. However, the model was refined for the south Merced area to reflect local access and circulation.

The MCAG Year 2035 model land use set was employed for the south Merced Area. However, because the model is relatively "coarse" the traffic model's Traffic Analysis Zones and link network were modified to better reflect actual conditions on the ground today as well as anticipated conditions in the future. New Traffic Analysis Zones were created north and south of Campus Parkway to reflect the project, as well as the adjoining approved retail uses.

The MCAG model reflects implementation of Tier I improvements noted in the 2014 Regional Transportation Plan. In addition, at the direction of City of Merced staff the model was refined to reflect the extension of Campus Parkway beyond SR-140 to Yosemite Avenue and the Parsons Avenue Extension.

Land Use

MCAG Year 2010 and Year 2035 land use sets were compared to identify the level of development anticipated in the study area. Based on this review it was determined that the project site was not developed in the MCAG model. Land Use (i.e., retail employees) generating daily traffic volumes equal to the project's net new trip estimate was added to the model. Similarly, land use was added to new Traffic Analysis Zones that represent the retail areas west of Coffee Street.

Approach to Developing Traffic Volume Forecasts

To provide the level of detail needed to address project driveways under long-term cumulative conditions, a three step process was developed to generate cumulative traffic volumes for both access scenarios.

For the study intersections on Childs Avenue, an incremental approach was taken to producing future traffic volumes that is intended to address the relative difference between baseline model forecasts and actual traffic counts. This approach follows these steps:

- Run the refined models for baseline and future conditions under daily and peak-hour formats.
- Compare baseline model forecasts with future forecasts to identify the incremental change in peak-hour or daily approach volume at each intersection and on each roadway segment.
- Add that increment to the existing approach or segment volumes counted in 2015 to create "adjusted future" volumes.
- Compare existing and adjusted future volumes to identify the growth rate on each approach or segment.
- Multiply each intersection approach by the growth rate and adjust the results to balance using the "Furness" techniques from the Transportation Research Board's (TRB) NCHRP Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design.

An alternative approach was taken to create forecasts for intersections on Campus Parkway as current volumes are too low to serve as the basis for projections. In this case, the share of daily

traffic occurring in each of the three analysis hours was assumed, along with the directionality relative to SR-99. AM peak-hour volumes were assumed to be 8 percent of the daily volume, with this traffic split 55 percent towards SR-99 and 45 percent to the north. The PM peak hour was assumed to contain 10 percent of the daily traffic with the directionality weighted away from SR-99. Saturday peak-hour traffic was assumed to be 11 percent of the weekday daily total, with the directionality split 50/50 with regards to the freeway.

The factors were applied to model daily turning movements at the control locations (i.e., SR-99 interchange and Gerard Avenue intersection) on either end of the study area. Project trips were then assigned based on the cumulative distribution assumptions noted earlier and the results were balanced versus entering and exiting volumes on Campus Parkway and on connecting streets.

Traffic Volumes/Intersection Improvements

Resulting Year 2035 Plus Project traffic volumes under each of the two access alternatives are presented in Exhibit 3.11-20, Exhibit 3.11-21, Exhibit 3.11-22, and Exhibit 3.11-23. These figures also identify assumed improvements to two intersections. Traffic signals are assumed at the Campus Parkway/Coffee Street intersection under the proposed project access scenario, and it was assumed that the space reserved today for a second eastbound left turn lane has been used for that purpose. Under the access consistent with the General Plan Circulation element scenario, the Campus Parkway/Coffee Street intersection is signalized but configured so as to prohibit outbound left turns and cross traffic.

Intersection Level of Service

Table 3.11-30, Table 3.11-31, and Table 3.11-32 display the AM, PM, and Saturday peak-hour Levels of Service at each study intersection under future year Cumulative conditions under the two access alternatives.

Table 3.11-30: Cumulative (Year 2035) Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Cumulative Plus Project Proposed Circulation		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	**188**	**F**	**115**	**F**
2	Childs Avenue/Coffee Street	Signal	12	B	16	B
3	Gerard Avenue/Coffee Street	AWS	15	C	15	C
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 7 6 2 4	 A A A A	 9 8 2 3	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	**80**	**E**	21	B

Table 3.11-30 (cont.): Cumulative (Year 2035) Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Cumulative Plus Project Proposed Circulation		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	— 4 0 3	— A — A	— 4 0 3	A A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	5 0	A A	5 0	A —
8	Coffee Street/South School Access EB approach	EB Stop	5	A	5	A
9	Coffee Street/Parsons Avenue	AWS	11	B	7	A
10	Mission Avenue/SB SR-99 ramps	Signal	**251**	**F**	43	D
11	Mission Avenue/NB SR-99 ramps	Signal	**99**	**F**	43	D
12	Campus Parkway/Coffee Street	Signal	**148**	**F**	21	B
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	4 3	A A	5 3	A A
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	6 8 6 3	A A A A	6 8 5 2	A A A A
15	Coffee Street/Central Access EB approach WB approach	EB/WB Stop	**137** 6	**F** A	5 4	A A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	2 **>999**	A **F**	—	—
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	2 **474**	A **F**	—	
		Signal	—		**63**	**E**
18	Coffee Street/South Access EB approach WB approach	EB/WB Stop	5 **64**	A **F**	5 2	A A

Table 3.11-30 (cont.): Cumulative (Year 2035) Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Cumulative Plus Project Proposed Circulation		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 1 3	 A A	 1 3	 A A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	 3 2	 A A	 1 3	 A A

Table 3.11-31: Cumulative Year 2035 Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	**137**	**F**	**133**	**F**
2	Childs Avenue/Coffee Street	Signal	9	A	8	A
3	Gerard Avenue/Coffee Street	AWS	9	A	9	A
4	Gerard Avenue/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	 17 9 5 3	 C A A A	 8 7 2 2	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	**86**	**F**	26	C
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/SB Stop	 4 2 0 2	 A A — A	 4 1 0 2	 A A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 4 0	 A —	 4 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 4	 A	 4	 A
9	Coffee Street/Parsons Avenue	AWS	**75**	**F**	13	B

Table 3.11-31 (cont.): Cumulative Year 2035 Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
10	Mission Avenue/SB SR-99 ramps	Signal	**279**	**F**	228	F
11	Mission Avenue/NB SR-99 ramps	Signal	**76**	**F**	43	D
12	Campus Parkway/Coffee Street	Signal	**138**	**F**	26	C
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 4 3	 A A	 8 3	 A B
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	 10 9 5 3	 B A A A	 6 6 4 2	 A A A A
15	Coffee Street/Central Access EB approach WB approach	WB Stop	 **>999** **137**	 **F** **F**	 21 5	 C A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 **>999**	 A **F**	—	—
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	 3 **49**	 A **E**	—	
	—	Signal	—		**60**	**E**
18	Coffee Street/South Access EB approach WB approach	EB/WB Stop	 5 **121**	 A **F**	 4 2	 A A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 1 2	 C A	 12 3	 B A
20	Mission Avenue/Pluim Dr SB approach EB left turn	SB Stop	 0 5	 A A	 2 3	 A A

Table 3.11-32: Cumulative Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	**153**	**F**	**68**	**E**
2	Childs Avenue/Coffee Street	Signal	7	A	7	A
3	Gerard Avenue/Coffee Street	AWS	9	A	9	A
4	Gerard Avenue/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	 29 12 4 5	 D B A A	 10 10 2 3	 B B A A
5	Gerard Avenue/Campus Parkway	Signal	**117**	**F**	**83**	**F**
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 4 2 0 2	 A A — A	 4 1 0 2	 — A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 0 0	 — —	 0 0	 — —
8	Coffee Street/South School Access EB approach	EB Stop	 0	 A	 0	 A
9	Coffee Street/Parsons Avenue	AWS	**372**	**F**	21	C
10	Mission Avenue/SB SR-99 ramps	Signal	**473**	**F**	**271**	**F**
11	Mission Avenue/NB SR-99 ramps	Signal	**95**	**F**	**62**	**E**
12	Campus Parkway/Coffee Street	Signal	**154**	**F**	32	C
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 4 3	 A A	 11 4	 B D
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	 11 9 5 4	 B A A A	 7 7 5 2	 A A A A
15	Coffee Street/Central Access EB approach WB approach	EB/WB Stop	 **>999** **589**	 **F** **F**	 **468** 15	 **F** C
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 **>999**	 A **F**	—	—

Table 3.11-32 (cont.): Cumulative Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	3 **433**	A **F**	—	
—	—	Signal	—		**95**	**F**
18	Coffee Street/South Access EB approach WB approach	EB/WB Stop	5 **142**	A **F**	7 3	A A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	1 3	A A	2 3	A A
20	Mission Avenue/Pluim Dr SB approach EB left turn	SB Stop	0 5	A A	1 4	A A

As indicated in Table 3.11-30, Table 3.11-31, Table 3.11-32 and summarized in Table 3.11-33, with development of the project with access as proposed, 10 locations will operate with Level of Service in excess of LOS D.

Under the General Plan Circulation alternative, six intersections would be deficient.

Table 3.11-33: Summary of LOS Deficiencies Year 2035 Plus Project Conditions

#	Intersection	LOS in Excess of LOS D?					
		Year 2035 Plus Projects with Proposed Access			Year 20325 Plus Project with General Plan Access		
		AM	PM	Saturday	AM	PM	Saturday
1	Childs Ave/Parsons Ave	Yes	Yes	Yes	Yes	Yes	Yes
5	Campus Parkway/Gerard Street	Yes	Yes	Yes	—	—	Yes
9	Coffee St/Parsons Ave	—	Yes	Yes	—	—	—
10	Mission Ave/SB SR-99	Yes	Yes	Yes	—	Yes	Yes
11	Mission Ave/NB SR-99	Yes	Yes	Yes	—	—	Yes
12	Campus Pkwy/Coffee St	Yes	Yes	Yes	—	—	—
15	Coffee St/Central Access	Yes	Yes	Yes	—	—	Yes
16	Campus Pkwy/Central Access	Yes	Yes	Yes	—		
17	Campus Pkwy/Pluim Dr	Yes	Yes	Yes	Yes	Yes	Yes
18	Coffee St/South Access	Yes	Yes	Yes	—	—	—

Traffic Signal Warrants

Table 3.11-34 summarizes the results of peak-hour warrant evaluation at un-signalized study area intersections. Under Year 2035 plus Project with access as proposed conditions, four locations carry volumes that would reach the level to satisfy signal warrants. However, three are "right turn only" locations that would not normally require signalization. If the General Plan Circulation System is implemented, one un-signalized location would warrant a signal.

Table 3.11-34: Existing Plus Approved Projects Traffic Signal Warrants Status

#	Intersection	Peak Hour Warrant Satisfied?					
		Cumulative Plus Project			Cumulative Plus Project General Plan Streets		
		AM	PM	Sat	AM	PM	Sat
3	E Gerard Ave/Coffee St	N	N	N	N	N	N
4	E Gerard Ave/Pluim Dr	N	N	N	N	N	N
9	Coffee Street/Parsons Avenue	N	Yes	Yes	N	Yes	Yes
13	S Coffee St/Mission Ave	N	N	N	N	N	N
14	Gerard Ave/Central Access	N	N	N	N	N	N
15	Coffee St/Central Access	N	Yes	Yes	N	N	Yes
16	Campus Pkwy/Central Access	N	Yes	Yes	—	—	—
17	Campus Pkwy/East Access	N	N	N	—		
18	Coffee St/Access	Yes	Yes	Yes	N	N	N
19	Mission Ave/Central Access	N	N	N	N	N	N
20	Mission Ave/East Access	N	N	N	N	N	N

Roadway Segments

Table 3.11-35 identifies Year 2035 daily traffic volumes on study area roadways if the Merced Gateway project is developed with access as proposed and if the project is developed with the General Plan circulation system. As shown, with one common exception, under both conditions the daily traffic volumes on these streets will remain at LOS C or better. The segment of Campus Parkway from SR-99 to Coffee Street is projected to carry volumes that are indicative of LOS F on a four-lane expressway. Table 3.11-36 summarizes travel speed on arterial roadways.

Impacts and Mitigation Measures

Cumulative Plus Merced Gateway with Access as Proposed Conditions

Level of Service Impacts

The Traffic Impact Analysis concludes that without improvements, 10 intersections will operate with Levels of Service that exceed the minimum LOS D standard during some time period. Table 3.11-37 and Exhibit 3.11-24 and Exhibit 3.11-25 identify mitigations needed under Cumulative Plus Project conditions with Access as Proposed. These improvements are similar to those identified under EPAP Plus Project conditions. As is summarized in Table 3.11-38, Table 3.11-39, and Table 3.11-40, these

mitigations would achieve the LOS D standard at some locations. However, most locations would remain deficient after implementation of feasible improvements.

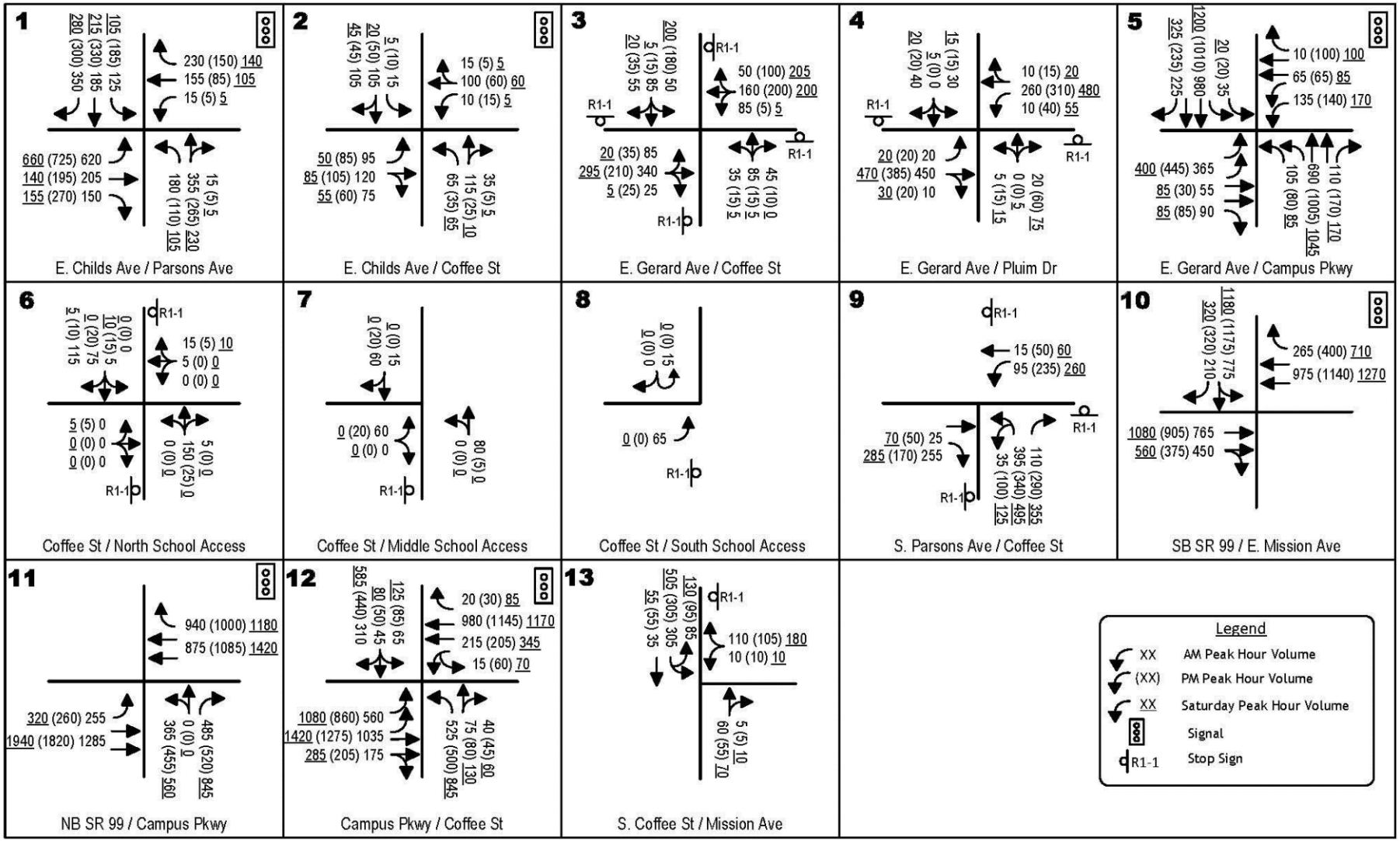
Six locations would operate with Level of service in excess of LOS D after mitigation.

The Mission Avenue/SR-99 Southbound ramp intersection (10) will operate at LOS F during the PM and Saturday peak hours. The Mission Avenue/Northbound SR-99 ramps intersection (11) will operate at LOS F during the PM and Saturday peak hour. The Campus Parkway/Coffee Street intersection (12) will operate at LOS E in the AM peak hour and LOS F during the PM and Saturday peak hour.

The identified improvements would yield LOS F at the Coffee Street/Central Access intersection (15) during the Saturday peak hour. This location is a right turn only, and further improvement is not feasible as all-way stop control and traffic signalization cannot be installed near the Coffee Street/Campus Parkway intersection. Similarly, with identified improvements, the Coffee Street/South Access intersection (18) is projected to operate at LOS F in the PM and Saturday peak hours. This location is a right turn only, and further improvement is not feasible as all-way stop control and traffic signalization cannot be installed near the Coffee Street/Campus Parkway intersection.

The Campus Parkway/Central Access intersection (16) is projected to operate at LOS F in the PM and Saturday peak hours. Review of simulation results indicate that these conditions relate to the delay experienced by motorists waiting for a gap in traffic in order to cross s traffic the westbound left turn lane at the Coffee Street intersection. While it is likely that some motorists could elect to use the eastern access rather than wait at this location and that diversion would improve the Level of service, no physical improvement to deliver LOS D is feasible.

Both of the SR-99 ramp intersections on Mission Avenue (10 and 11) will operate at LOS E or F during the PM and Saturday peak hours. The Campus Parkway/Coffee Street intersection (12) will operate at LOS F in the PM and Saturday peak hours.

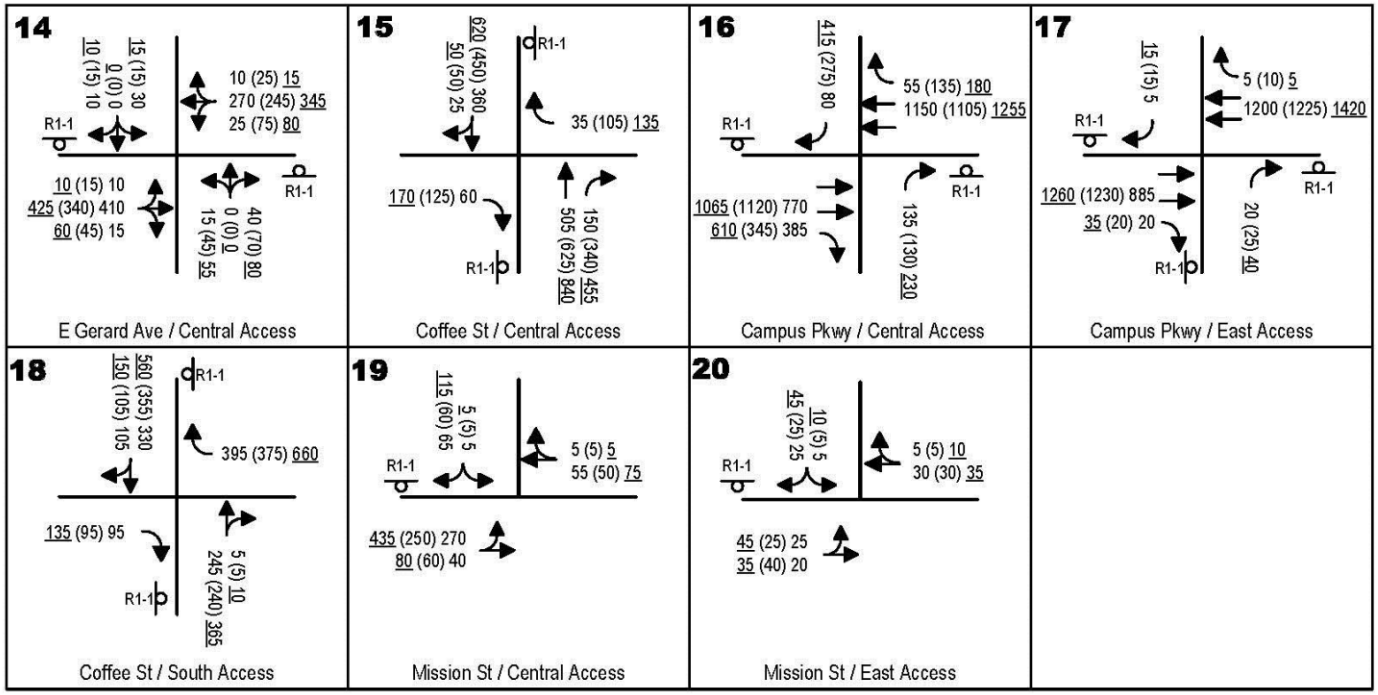


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-20
Cumulative Plus Project / Access as Proposed Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

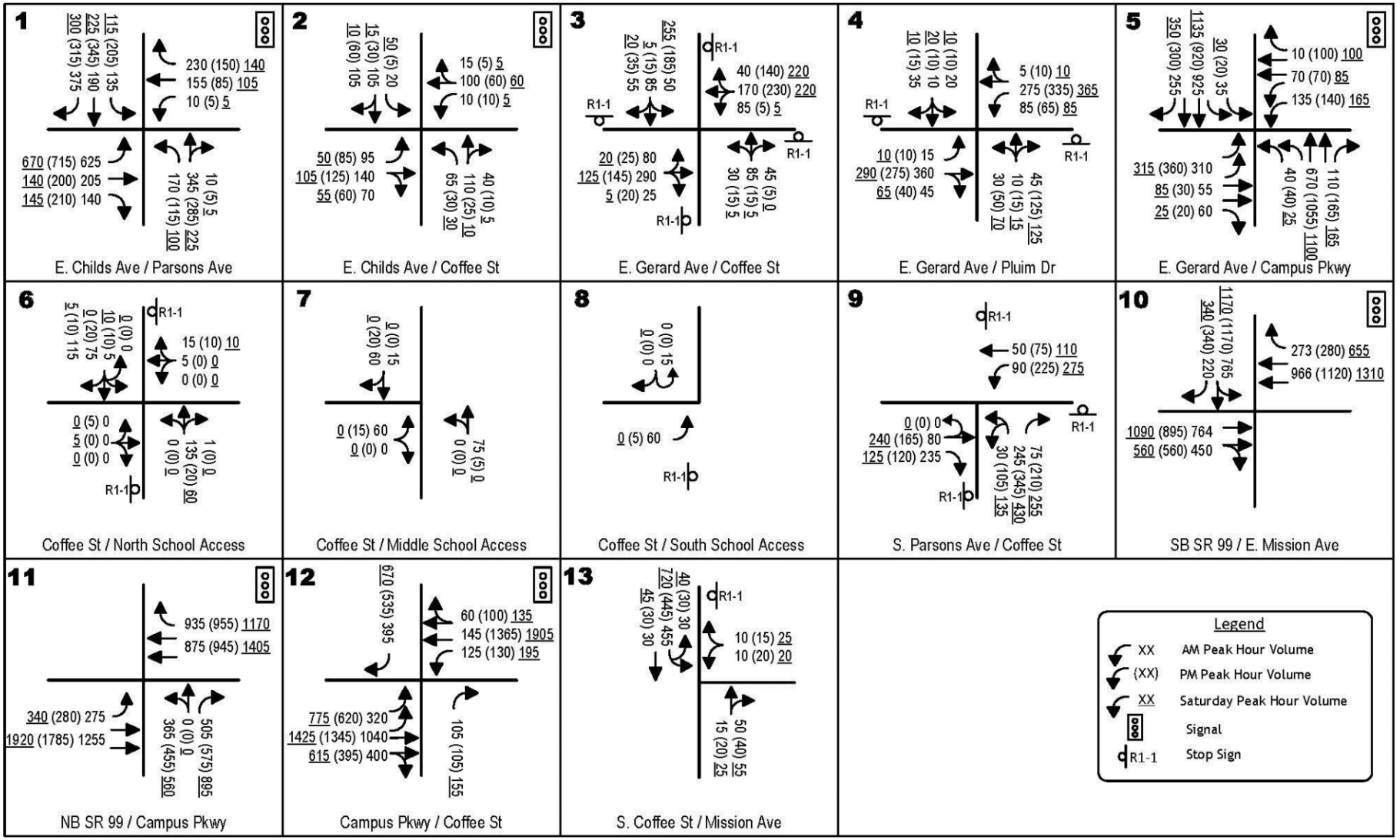


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-21
Cumulative Plus Project / Access as Proposed Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

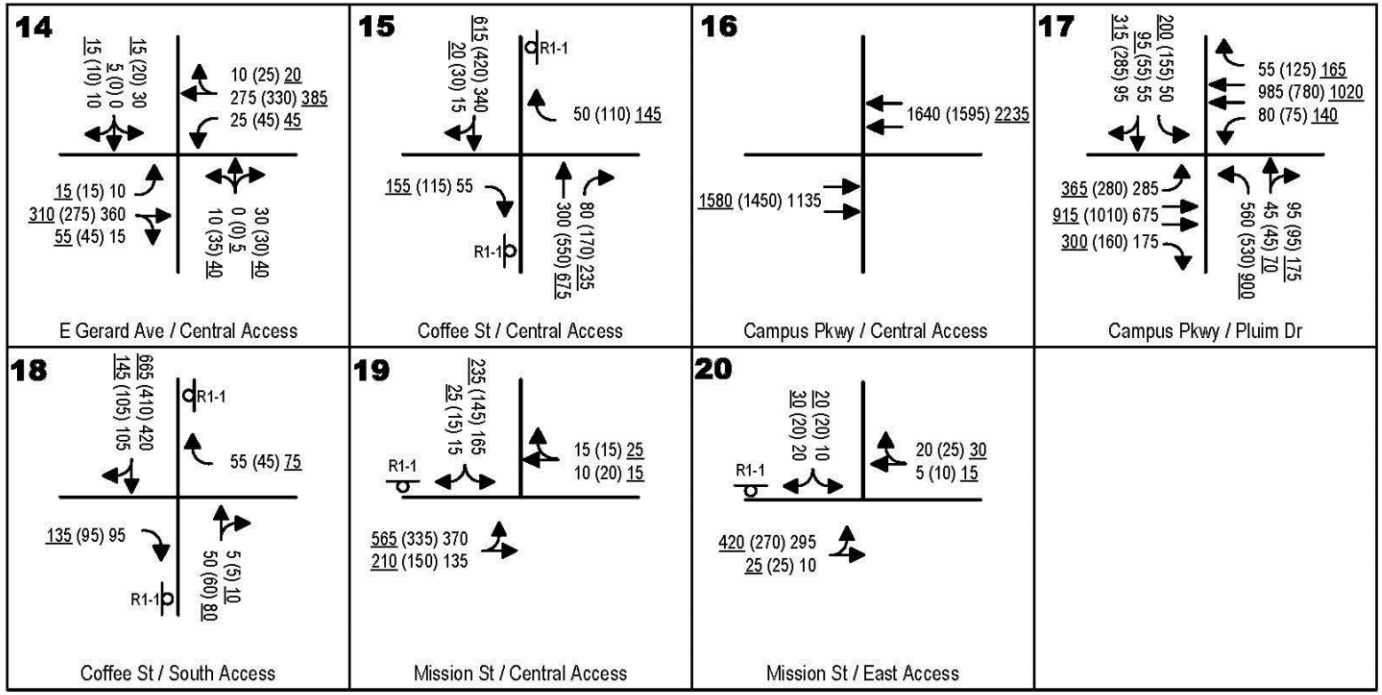


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-22
Cumulative Plus Project with General Plan
Streets Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

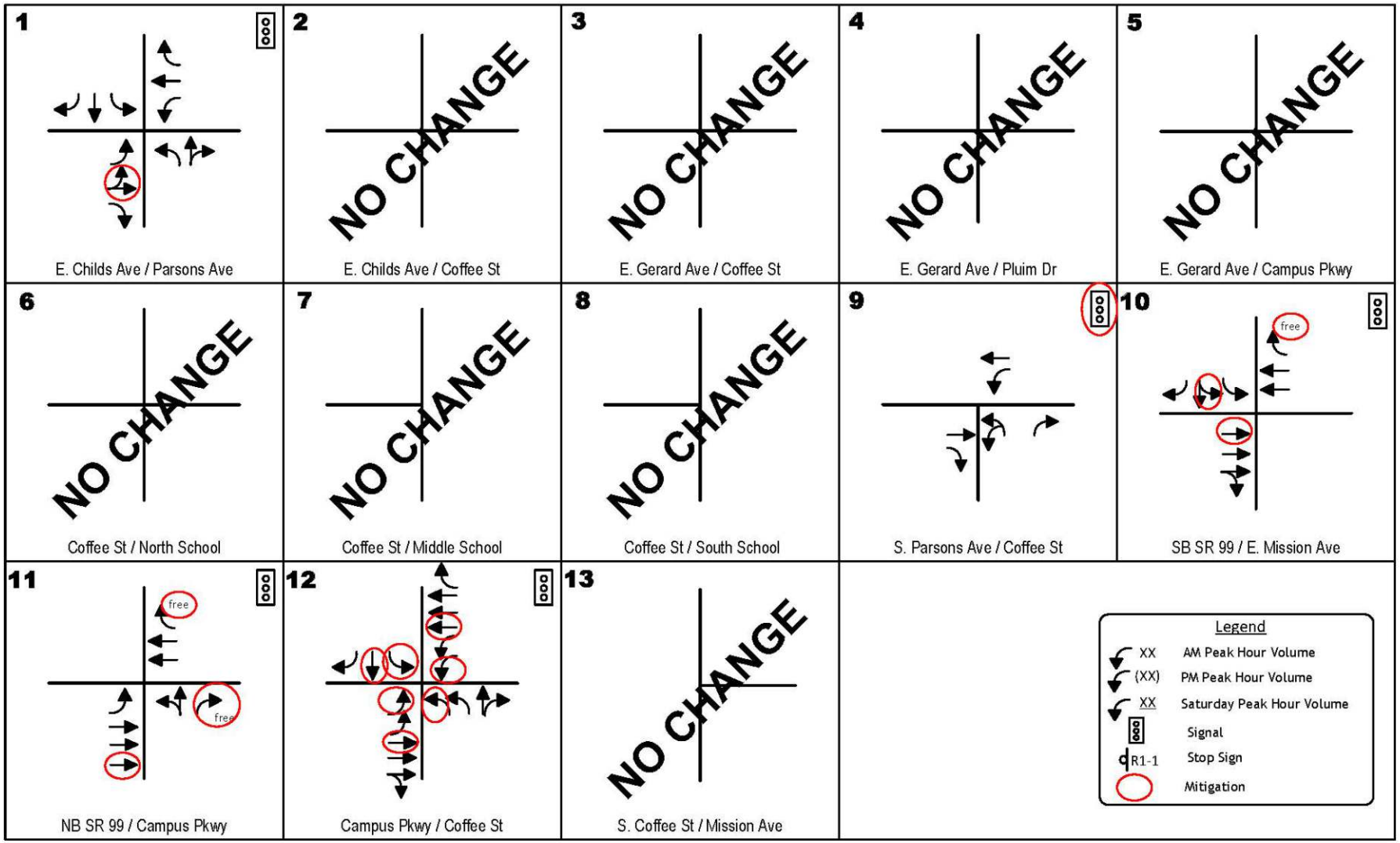


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-23
Cumulative Plus Project with General Plan
Streets Traffic Volumes and Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



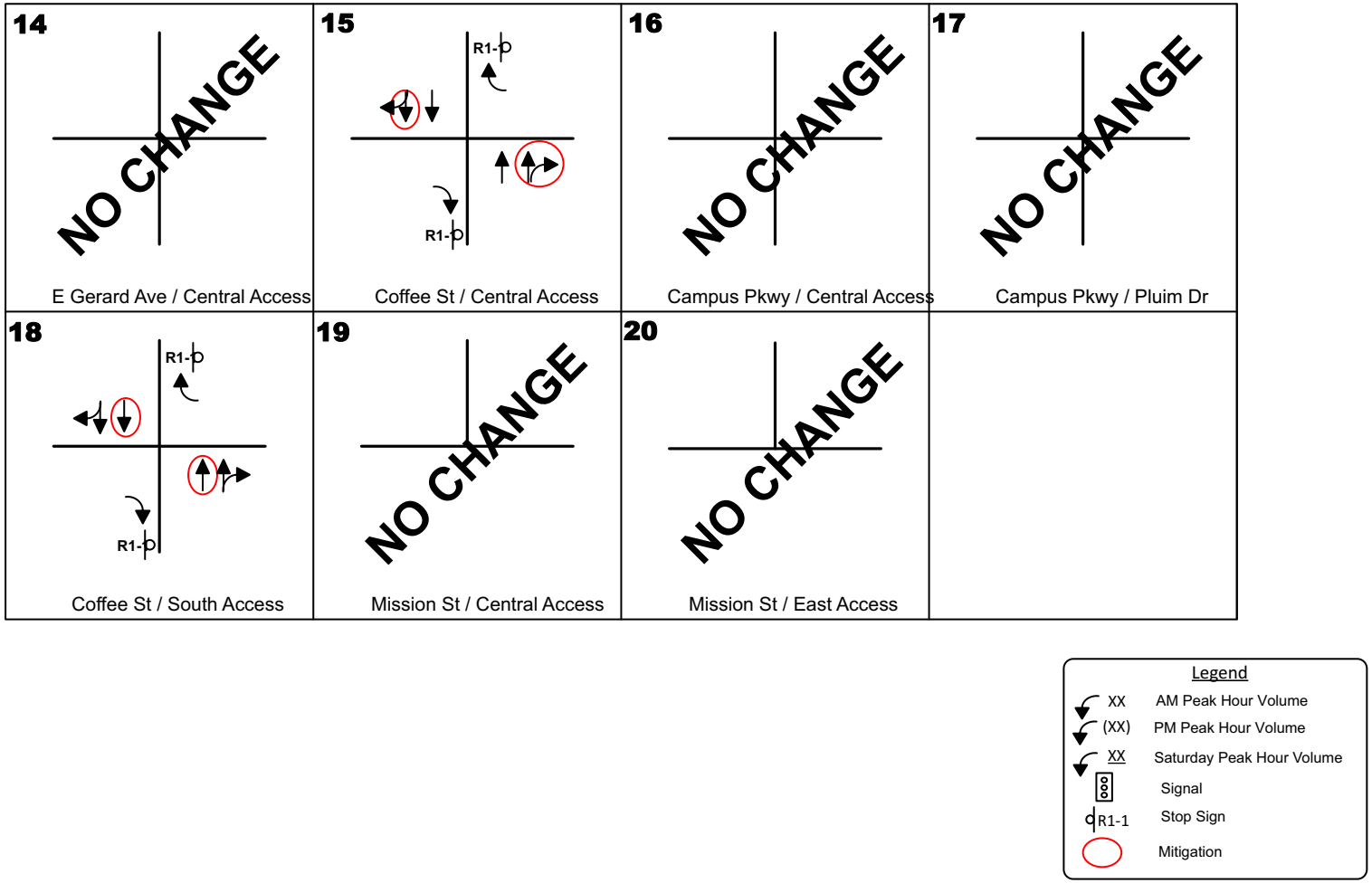
Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-24

Mitigations Cumulative Plus Project / Access as Proposed Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-25
Mitigations Cumulative Plus Project / Access as Proposed Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

Table 3.11-35: Year 2035 Plus Project Daily Traffic Volumes and Level of Service

Street	From	To	Classification	Year 2035 Plus Project			
				Proposed Access		General Plan Access Alternative	
				Daily Volume	LOS	Daily Volume	LOS
Campus Parkway	SR-99	Coffee Street	4 lane Expressway	**42,075**	**F**	**42,000**	**F**
	Coffee Street	Central Access	4 lane Expressway	27,700	C	30,450	C
	Central Access	Pluim Drive	4 lane Expressway	22,700	C	30,450	C
	Pluim Drive	Gerard Avenue	4 lane Expressway	22,950	C	23,400	C
	Gerard Avenue	Childs Avenue	4 lane Expressway	28,480	C	28,480	C
Coffee Street	Childs Avenue	Gerard Avenue	2 lane Collector	3,800	C	4,150	C
	Parsons Avenue	Campus Parkway	2 lane Collector	**16,400**	**F**	13,200	D
	Campus Parkway	Mission Avenue	2 lane Collector	**13,800**	**E**	8,000	D
SR-99	Childs Avenue	Mission Avenue	6 lane Freeway	68,600	D	68,450	D
	Mission Avenue	South	6 lane Freeway	60,700	C	60,950	C

Table 3.11-36: Cumulative Plus Project Average Arterial Travel Speed

Street	Location	Direction	Average Travel Speed (MPH)					
			AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
			Proposed Access	General Plan Access	Proposed Access	General Plan Access	Proposed Access	General Plan Access
Mission Ave	SB ramps to NB ramps	EB	6	24	9	20	8	20
	NB ramps to Coffee St		6	29	7	25	10	32
Campus Pkwy	Coffee Street to Central Access		31	40	29	37	33	29
	Coffee Street to Pluim Drive		47	19	45	17	43	17

Table 3.11-36 (cont.): Cumulative Plus Project Average Arterial Travel Speed

Street	Location	Direction	Average Travel Speed (MPH)					
			AM Peak Hour		PM Peak Hour		Saturday Peak Hour	
			Proposed Access	General Plan Access	Proposed Access	General Plan Access	Proposed Access	General Plan Access
	Pluim Drive to Gerard Avenue		41	34	37	33	37	38
—	***Average Speed***		***15***	***29***	***16***	***26***	***22***	***29***
	Level of Service		***F***	***C***	***E***	***D***	***F***	***C***
Campus Pkwy	Gerard Ave to Pluim Drive	WB	43	24	43	27	41	10
	Pluim Drive to Central Access		43	26	26	31	21	5
	Central Access to Coffee Street		9	15	4	11	3	4
Mission Ave	Coffee Street to NB ramps		18	21	16	12	13	10
	NB ramps to SB ramps		27	30	22	23	20	20
—	***Average***		***25***	***20***	***14***	***21***	***16***	***8***
	Level of Service	—	***D***	***E***	***F***	***E***	***E***	***F***

Table 3.11-37: Mitigations for Cumulative Plus Project Conditions

#	Intersection	Improvements	
		Cumulative Plus Merced Gateway Access as Proposed	Cumulative Plus Merced Gateway General Plan Access
1	Childs Avenue/Parsons Avenue	Reconfigure EB through lane to thru plus left turn	Reconfigure EB through lane to thru plus left turn
2	Childs Avenue/Coffee Street	None	None
3	Gerard Avenue/Coffee Street	None	None
4	Gerard Avenue/Pluim Drive	None	None
5	Gerard Avenue/Campus Parkway	None	None

Table 3.11-37 (cont.): Mitigations for Cumulative Plus Project Conditions

#	Intersection	Improvements	
		Cumulative Plus Merced Gateway Access as Proposed	Cumulative Plus Merced Gateway General Plan Access
6	Coffee Street/North School Access	None	None
7	Coffee Street/Central School Access	None	None
8	Coffee Street/South School Access	None	None
9	Coffee Street/Parsons Avenue	Traffic signal..	Traffic Signal
10	Mission Avenue/SB SR-99 ramps	Add 2nd SB left turn lane, 3rd EB thru lane and "free" WB right turn lane	Add 2nd SB left turn lane and 3rd EB thru lane and "free" WB right turn lane
11	Mission Avenue/NB SR-99 ramps	Add 3rd EB thru lane and make NB right turn lane and WB right turn lane "free"	Add 3rd EB thru lane and make NB right turn lane and WB right turn lane "free"
12	Campus Parkway/Coffee Street	Traffic signal and add third EB Thru lane, 2nd EB left turn lane; 3rd WB thru lane and WB right turn lane; 2nd NB left turn lane; separate SB left turn and thru lanes, with overlap phase on SB right turn. Widen Coffee Street to receive dual left turn lanes	Traffic signal and add third EB Thru lane, 2nd EB left turn lane; 3rd WB thru lane, with overlap phase on SB right turn. Widen Coffee Street to receive dual left turn lanes.
13	Coffee Street/E. Mission Avenue	Accommodate SB to NB U-turns	None
14	Gerard Avenue/Project Access	None	None
15	Coffee Street/Central Access	None	None
16	Campus Parkway/Central Access	None	None
17	Campus Parkway/Pluim Drive	None	Add 2nd EB left turn lane, 2nd WB left turn lane, 2nd NB left turn lane and 2nd SB left turn lane
18	Coffee Street/South Access	None	None
19	Mission Avenue/Central Access	None	None
20	Mission Avenue/Pluim Drive	None	None
—	Coffee Street from Parsons Avenue to Campus Parkway	Four lane section	None

Table 3.11-37 (cont.): Mitigations for Cumulative Plus Project Conditions

#	Intersection	Improvements	
		Cumulative Plus Merced Gateway Access as Proposed	Cumulative Plus Merced Gateway General Plan Access
—	Mission Avenue (Campus Parkway) between SR 99 ramps and Coffee Street.	Six lane section	Six lane section
—	Coffee Street from Campus Parkway to Mission Avenue	Four lane section	—
—	Parsons Avenue from Coffee Street to the project's eastern boundary	Provide adequate truck turning radii and roadway structural section	None

Table 3.11-38: Mitigated Cumulative (Year 2035) Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Cumulative Plus Project Proposed Circulation		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	42	D	43	D
2	Childs Avenue/Coffee Street	Signal	15	C	17	B
3	Gerard Avenue/Coffee Street	AWS	18	C	14	B
4	Gerard Avenue/Pluim Drive SB approach NB approach EB left turn WB left turn	NB/SB Stop	 8 7 2 4	 A A A A	 8 8 2 3	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	23	C	21	C
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 0 4 0 3	 — A — A	 0 4 0 3	 — A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 5 0	 A —	 5 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	5	A	5	A
9	Coffee Street/Parsons Avenue	AWS	—	—	8	A
		Signal	8	A	—	—
10	Mission Avenue/SB SR-99 ramps	Signal	53	D	18	D
11	Mission Avenue/NB SR-99 ramps	Signal	49	D	18	D
12	Campus Parkway/Coffee Street	Signal	**60**	**E**	14	B
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 4 3	 A A	 6 3	 A A
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	 6 8 6 3	 A A A A	 7 8 5 2	 A A A A
15	Coffee Street/Central Access EB approach WB approach	EB/WB Stop	 5 5	 A A	 3 4	 A A

Table 3.11-38 (cont.): Mitigated Cumulative (Year 2035) Plus Project Conditions—AM Peak Hour

#	Intersection	Control	AM Peak Hour			
			Cumulative Plus Project Proposed Circulation		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 9	 A A	—	
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	2 5	A A	—	
		Signal	—		36	D
18	Coffee Street/South Access EB approach WB approach	EB/WB Stop	 5 9	 A A	 5 2	 A A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 1 3	 A A	 1 3	 A A
20	Mission Avenue/Pluim Drive SB approach EB left turn	SB Stop	 3 2	 A A	 1 3	 A A

Table 3.11-39: Mitigated Cumulative Year 2035 Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	38	D	45	D
2	Childs Avenue/Coffee Street	Signal	10	A	10	A
3	Gerard Avenue/Coffee Street	AWS	—	—	10	A
4	Gerard Avenue/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	 7 7 2 3	 A A A A	 7 7 2 2	 A A A A
5	Gerard Avenue/Campus Parkway	Signal	27	C	26	C

Table 3.11-39 (cont.): Mitigated Cumulative Year 2035 Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/SB Stop	 4 2 0 2	 A A — A	 4 1 0 2	 A A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 4 0	 A —	 4 0	 A —
8	Coffee Street/South School Access EB approach	EB Stop	 4	 A	 5	 A
9	Coffee Street/Parsons Avenue	AWS	—	—	17	C
		Signal	13	B	—	—
10	Mission Avenue/SB SR-99 ramps	Signal	**79**	**E**	26	C
11	Mission Avenue/NB SR-99 ramps	Signal	**70**	**E**	25	C
12	Campus Parkway/Coffee Street	Signal	**90**	**F**	17	C
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 5 3	 A A	 8 3	 A B
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	 9 6 5 3	 A A A A	 6 6 4 2	 A A A A
15	Coffee Street/Central Access EB approach WB approach	WB Stop	 7 6	 A A	 6 9	 C A
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 2 50	 A D	—	—
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	 3 7	 A A	—	
	—	Signal	—		26	C

Table 3.11-39 (cont.): Mitigated Cumulative Year 2035 Plus Project Conditions—PM Peak Hour

#	Intersection	Control	PM Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
18	Coffee Street/South Access EB approach WB approach	EB/WB Stop	 5 **76**	 A **F**	 5 2	 A A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 1 3	 A A	 15 3	 B A
20	Mission Avenue/Pluim Dr SB approach EB left turn	SB Stop	 0 5	 A A	 1 3	 A A

Table 3.11-40: Mitigated Cumulative Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Childs Avenue/Parsons Avenue	Signal	24	C	29	C
2	Childs Avenue/Coffee Street	Signal	8	A	8	A
3	Gerard Avenue/Coffee Street	AWS	10	—	10	A
4	Gerard Avenue/Pluim Drive NB approach SB approach EB left turn WB left turn	NB/SB Stop	 13 10 5 4	 B B A A	 10 10 2 3	 B B A A
5	Gerard Avenue/Campus Parkway	Signal	32	C	19	B
6	Coffee Street/North School Access EB approach WB approach NB left turn SB left turn	EB/WB Stop	 4 2 0 3	 A A — A	 4 1 0 2	 — A — A
7	Coffee Street/Central School Access EB approach NB left turn	EB Stop	 0 0	 — —	 0 0	 — —

Table 3.11-40 (cont.): Mitigated Cumulative Plus Project Conditions—Saturday Peak Hour

#	Intersection	Control	Saturday Peak Hour			
			Cumulative Plus Project		Cumulative Plus Project GP Circulation	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
8	Coffee Street/South School Access EB approach	EB Stop	 0	 —	 0	 —
9	Coffee Street/Parsons Avenue	AWS	—	—	35	C
		Signal	19	B	—	—
10	Mission Avenue/SB SR-99 ramps	Signal	**165**	**F**	36	D
11	Mission Avenue/NB SR-99 ramps	Signal	**79**	**E**	**67**	**E**
12	Campus Parkway/Coffee Street	Signal	**92**	**F**	46	D
13	Coffee Street/E. Mission Avenue WB approach SB left turn	WB Stop	 6 4	 A A	 11 4	 B D
14	Gerard Avenue/Project Access NB approach SB approach EB left turn WB left turn	NB/SB Stop	 13 9 5 4	 B A A A	 7 7 5 2	 A A A A
15	Coffee Street/Central Access EB approach WB approach	EB/WB Stop	 **97** 11	 **F** C	 **234** **150**	 **F** **F**
16	Campus Parkway/Central Access NB approach SB approach	NB/SB Stop	 3 **103**	 A **F**	—	—
17	Campus Parkway/Pluim Drive NB approach SB approach	NB/SB Stop	 3 9	 A A	—	
—	—	Signal	—		53	D
18	Coffee St/South Access EB approach WB approach	EB/WB Stop	 9 **104**	 A **F**	 7 3	 A A
19	Mission Avenue/Central Access SB approach EB left turn	SB Stop	 1 3	 A A	 2 3	 A A
20	Mission Avenue/Pluim Dr SB approach EB left turn	SB Stop	 0 5	 A A	 1 4	 A A

Roadway Segments

The identified improvements would create three lanes in each direction on Campus Parkway between SR-99 and Coffee Street, and the resulting Level of Service on this segment would be LOS C.

The segment of Coffee Road from Parsons Avenue to Campus Parkway will need to be improved to a four lane section to deliver LOS D or better conditions and to accommodate the intersection geometry prescribed for the Campus Parkway/Coffee Street and Coffee Street/Parsons Avenue intersections.

The segment of Coffee Street from Campus Parkway to Mission Street would require similar treatment (i.e., four lanes). A design that accommodates the northbound lanes needed at the Campus Parkway intersection, creates a receiving area for dual left turns from Campus Parkway and accommodates U-turns at the Mission Avenue intersection would also be needed.

Roadway Speeds

To provide further perspective, the average travel speed on Mission Avenue/Campus Parkway between SR-99 and Gerard Avenue was determined from Simtraffic simulation. These forecasts are derived from the work done to estimate intersection delays and reflect the effects of un-signalized access proposed with the project. The results can be used to assess Level of service based on the HCM criteria presented in Table 3.11-36.

Table 3.11-36 contrasts average travel speed for cumulative conditions by direction. As indicated, with implementation of the proposed access strategy and identified mitigations, the expressway will carry traffic at speeds that are indicative of LOS F (westbound) and LOS D (eastbound) in the AM peak hour, LOS E/F in the PM peak hour and LOS D/E in the Saturday peak hour.

Cumulative Plus Merced Gateway with General Plan Access

Level of Service Impacts

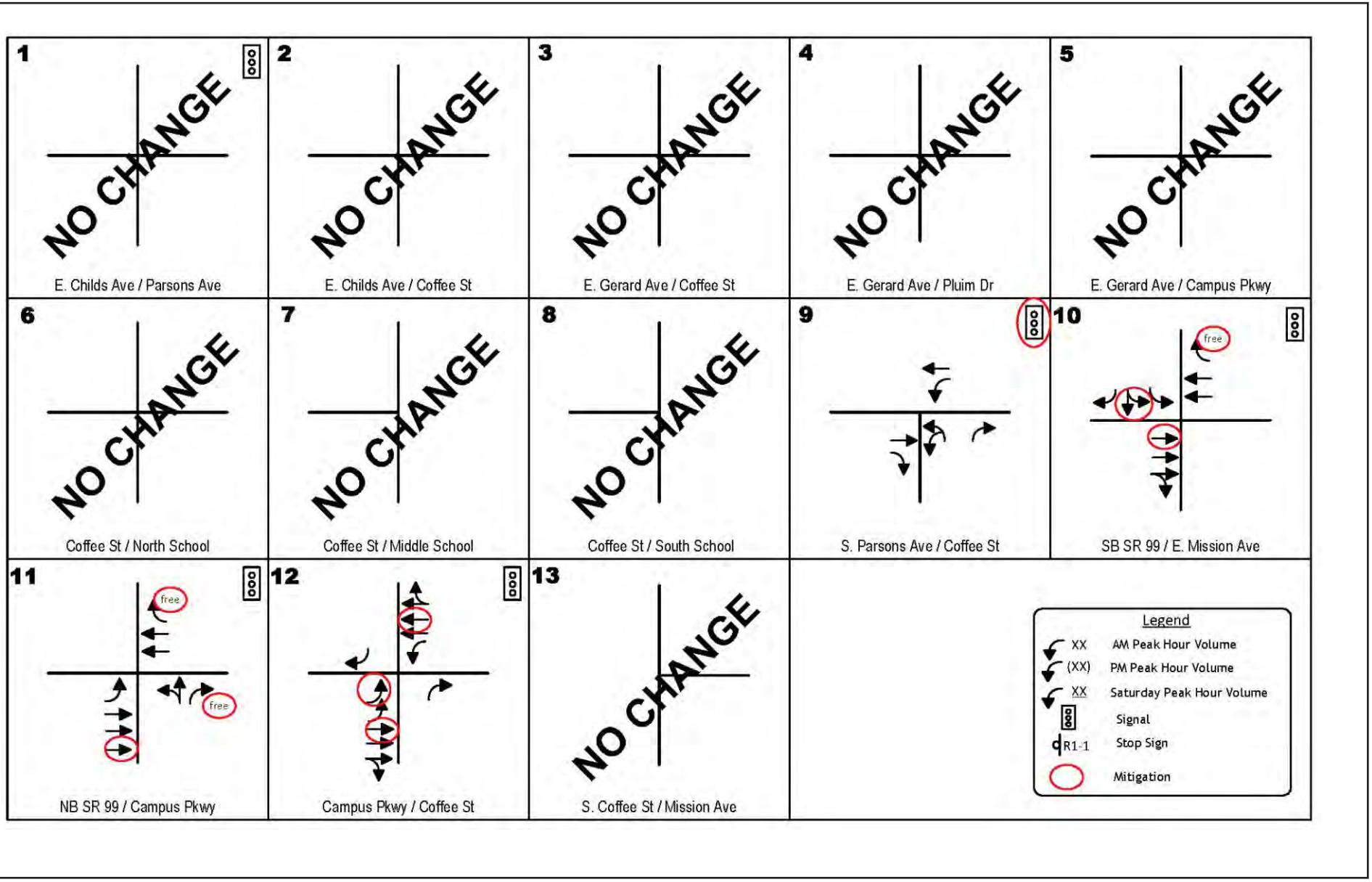
The Traffic Impact Analysis concludes that without improvements, six intersections will operate with Levels of Service that exceed the minimum LOS D standard during some time period. Table 3.11-37, Exhibit 3.11-26, and Exhibit 3.11-27 identify mitigations needed under Cumulative Plus Project conditions with General Plan Access. As is summarized in Table 3.11-38, Table 3.11-39, and Table 3.11-40, these mitigations would achieve LOS D at most locations; however, two locations would remain deficient after implementation of feasible improvements.

The SR 99 Northbound Ramps (11) will operate at LOS E in the Saturday peak hour.

The identified improvements would achieve LOS F at the Coffee Street/Central Access intersection (15) on Saturday peak hour. This location is a right turn only, and further improvement is not feasible, as all-way stop control and traffic signalization cannot be installed near the Coffee Street/Campus Parkway intersection.

Roadway Segments

The identified improvements would create three lanes in each direction on Campus Parkway between SR-99 and Coffee Street, and the resulting Level of Service on this segment would be LOS C.

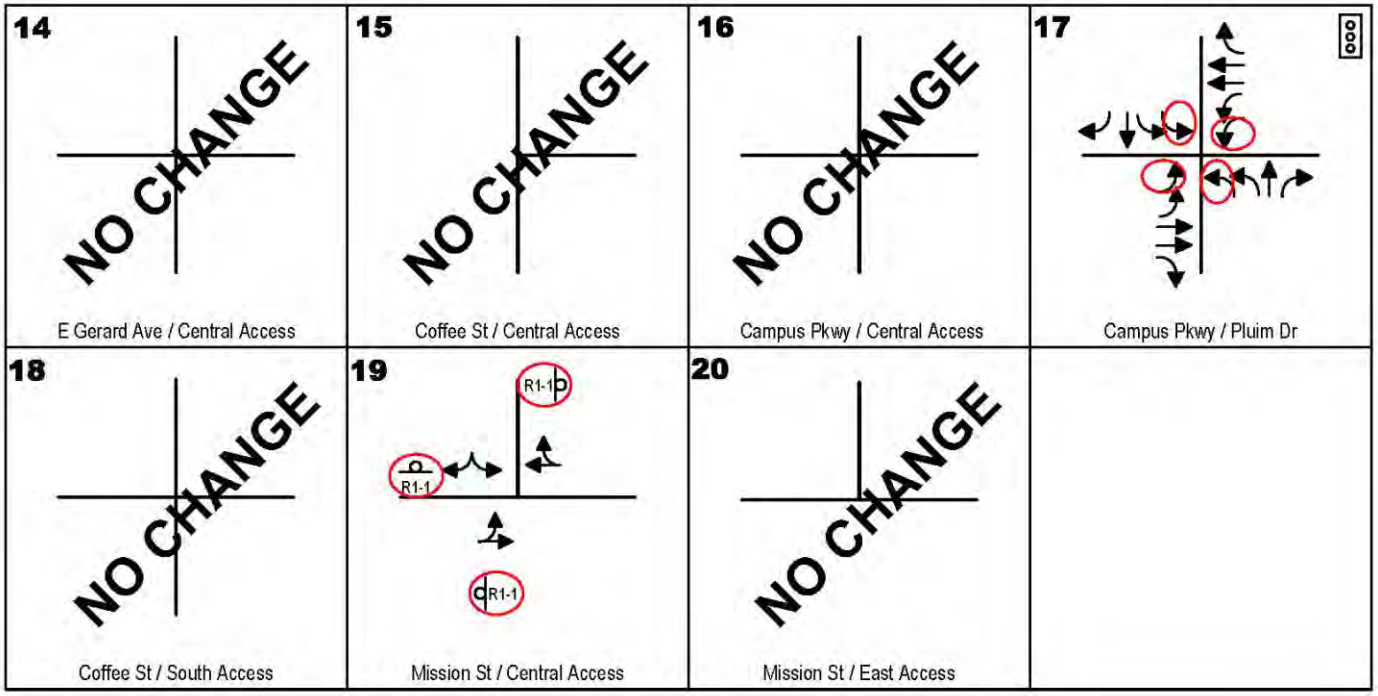


Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-26
Mitigations Cumulative Plus Project with General Plan Streets Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK



Source: KD Anderson & Associates, Inc. 2016

FirstCarbon® SOLUTIONS

Exhibit 3.11-27
Mitigations Cumulative Plus Project with General Plan Streets Lane Configurations

THIS PAGE INTENTIONALLY LEFT BLANK

Travel Speed on Mission Avenue–Campus Parkway. Table 3.11-36 identifies average travel speed for cumulative conditions by direction. As indicated, with implementation of the General Plan Circulation system and identified mitigations, the expressway will carry traffic at speeds that are indicative of LOS C (westbound) and LOS E (eastbound) in the AM peak hour, LOS D/E in the PM peak hour, and LOS C/F in the Saturday peak hour.

Conclusion

The proposed project would contribute new trips to intersection and roadway segments that would operate at unacceptable levels during Cumulative Plus Project conditions. Feasible mitigation measures are proposed that would improve operations at some—but not all—facilities. Additionally, certain facilities are outside the jurisdictional control of the City of Merced, and, therefore, uncertainty exists regarding whether the improvements would be implemented as contemplated. For these reasons, the residual significance of this impact is significant and unavoidable.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measures TRANS-1a, TRANS-1b, TRANS-1c, TRANS-1d, TRANS-1e, TRANS-1f, TRANS-1g, TRANS-2, and:

MM TRANS-3a ,Prior to issuance of building permits for the proposed project, the project applicant shall pay impact fees to the City of Merced for improvements to the intersection of Childs Avenue/Parsons Avenue (1). The improvements shall consist of reconfiguring the eastbound through lane to a shared through/left-turn lane. The City of Merced shall install the improvements when monitoring determines that the intersection is approaching unacceptable levels.

MM TRANS-3b In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, widen Coffee Street between Campus Parkway and Mission Avenue to four lanes.

Level of Significance After Mitigation

Significant unavoidable impact: Campus Parkway/Coffee Street (12), Mission Ave/SB SR-99 ramps (10), Mission Ave/NB SR-99 ramps (11), Campus Parkway/Central Access (16), Coffee Street/Central access (15), and Coffee Street/South Access (18).

Less than significant impact: Childs Avenue/Parsons Avenue (1), Gerard Avenue/Campus Parkway (5), Coffee Street/Parsons Avenue (9), and Campus Parkway/Pluim Drive (17).

Congestion Management Program

Impact TRANS-4: The project may conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

Impact Analysis

The following study facilities are under the jurisdiction of the Merced County Regional Transportation Plan: SR-99, Campus Parkway, and Mission Avenue.

As discussed in Impacts TRANS-1, TRANS-2, and TRANS-3, the project would result in significant impacts to several roads, including Mission Avenue/SR-99 Southbound Ramps, Mission Avenue/SR-99 Northbound Ramps, and Campus Parkway/Coffee Street. Mitigation measures are proposed to improve operations; however, certain facilities are outside the jurisdictional control of the City of Merced, and, therefore, uncertainty exists regarding whether the improvements would be implemented as contemplated. For these reasons, the residual significance of this impact is significant and unavoidable.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measures AIR-7b, TRANS-1d, TRANS-1e, TRANS-1f, TRANS-1g, and TRANS-2.

Level of Significance After Mitigation

Significant unavoidable impact: Significant unavoidable impact: Mission Ave/SB SR-99 ramps, Mission Ave/NB SR-99 ramps, Campus Parkway/Coffee Street intersection (12), and travel speed on Mission Avenue/Campus Parkway.

Roadway Safety

Impact TRANS-5: The project may substantially increase hazards due to a design feature or incompatible uses.

Impact Analysis

This impact assesses whether the project would substantially increase hazards due to a design feature or incompatible uses. Topics addressed include truck circulation and railroad grade crossings. Pedestrian facilities in the area around Pioneer Elementary School are discussed under the "Public Transit, Bicycles, and Pedestrians" section below.

Truck Circulation

Under Cumulative Conditions, the choice of project access alternative would have an impact on truck circulation.

Sources of Truck Traffic

The Walmart Distribution Center on Gerard Avenue east of Campus Parkway will add truck traffic to the area circulation system. However, most truck traffic will make use of Campus Parkway to reach SR-99 to the south and to reach Childs Avenue and eventually SR-140 to the north. The choice of project access alternative would not have an appreciable effect on the truck traffic associated with the Walmart Distribution Center.

The parcel immediately east of the project site is designated Business Park (BP) in the Merced General Plan. No development has been approved on this site. The types of uses permitted under this designation typically range from light industrial to office to limited retail uses. Under the General Plan Circulation alternative, this use would have direct access to Pluim Drive in the area between Gerard Avenue and Campus Parkway, as well as access possible to Gerard Avenue. The parcel would not have direct access to Campus Parkway without an approval to amend the circulation element of the City's General Plan. Direct access at Campus Parkway is possible but may not be desirable for trucks because of the curve in the expressway alignment.

If the project proceeds with access as proposed, then access to the Business Park parcel will be changed. The parcel would have direct access to Gerard Avenue, and the routes to Campus Parkway could include Gerard Avenue east to Campus Parkway or the proposed Parsons Avenue extension west to Coffee Street to Campus Parkway. Because of the availability of these routes, the BP uses would not be expected to add appreciable truck traffic to Gerard Avenue west of Pluim Drive.

The turning requirements of full-size trucks are a consideration with regard to the feasibility of access via collector streets. Because truck turns are made slowly and cover a broad area, left turn lanes are typically justified for truck access. If the proposed access is pursued, then the Parsons Avenue extension will need to be designed to accommodate truck traffic through the site. This recommendation is reflected in Mitigation Measure TRANS-5, and the implementation of this measure would reduce impacts to a level of less than significant.

Truck Access Impacts

Elimination of the Pluim Drive connection to Campus Parkway will increase the amount of truck traffic on the Parsons Avenue extension as trucks access the adjoining BP parcel. The Parsons Avenue extension will need to be designed to accommodate truck turns. In addition to consideration of the turning requirements of trucks, the structure of Parsons Avenue in terms of pavement thickness will need to reflect the possibility of future truck traffic created if the adjoining parcel is developed. This recommendation is reflected in Mitigation Measure TRANS-5, and the implementation of this measure would reduce impacts to a level of less than significant.

Railroad Grade Crossings

The Union Pacific Railroad parallels the west side of SR-99 in the project vicinity. Mission Avenue has a grade separated crossing of the railroad tracks. As such, project-related trips traveling on this segment of Mission Avenue would not cross the railroad tracks at-grade.

The closest at-grade railroad crossings of the Union Pacific Railroad are at Gerard Avenue and Healy Road on the west side of SR-99, approximately 0.8 mile and 0.3 mile from the project site,

respectively. These facilities are two-lane rural roads that provide local access to agricultural and industrial properties located along these roadways. Accessing these railroad grade crossings from the project site would require circuitous circulation patterns, and, thus, it would be unlikely that project-related trips would regularly use these at-grade railroad crossings such that a significant safety impact would occur. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

MM TRANS-5 In accordance with the transportation improvement phasing plan identified in MM TRANS-1g, the applicant shall retain a qualified engineer to design the Parsons Avenue extension between Coffee Street and the eastern boundary of the project to be capable of handling commercial trucks. The roadway improvement plans shall be submitted to the City of Merced for review and approval. The Parsons Avenue extension shall be completed by the time of issuance of the first certificate of occupancy for the North commercial area.

Level of Significance After Mitigation

Less than significant impact.

Emergency Access

Impact TRANS-6: The project would not result in inadequate emergency access.

Impact Analysis

Vehicular access to the commercial uses on the south side of Campus Parkway is proposed to be taken from two right-in, right-out points out on Campus Parkway; a right-in and right-out turns on S. Coffee Street; and two full access points on E. Mission Avenue.

Vehicular access to the commercial uses on the north side of Campus Parkway are proposed to be taken from one full access points on S. Coffee Street (below the road block), and one right-in and right-out (below Parsons Avenue); two right-in and right-out driveways to Campus Parkway; and two full access points on Gerard Avenue.

Vehicular access to the multi-family residential uses would be taken from two full access points (one E. Gerard Avenue and another on Coffee Street) via reciprocal access from the commercial uses, and direct access from one full access driveway on Coffee Street immediately south of the Gerard Avenue/Coffee Street intersection.

In summary, all uses within the project site would be served with two or more vehicular access points in accordance with California Fire Code requirements.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Public Transit, Bicycles, and Pedestrians

Impact TRANS-7: The project may conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Impact Analysis

This impact assesses whether the project would conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Transit

The project will likely attract persons from throughout the Merced area who may wish to use public transit. Route M5 passes the site hourly on Gerard Avenue, and it is reasonable to expect that the transit stop included in the project will be incorporated into that route as a regular designated stop. As such, the proposed project would be accessible to transit. Impacts would be less than significant.

Bicycles

The project can be expected to attract bicyclists from various south Merced neighborhoods. As noted in the Existing Conditions discussion, bicycle facilities already exist along Campus Parkway and have been installed on Coffee Street between Campus Parkway and Parsons Avenue, and on Parsons Avenue west of Coffee Street. Class II bike lanes are planned on all collector and arterial streets. Bicycle lanes would be installed as part of the project's frontage improvements on those streets. In addition, MM AIR-7a provides for safe bicycle crossings on internal streets in the project.

If the project proceeds with access as proposed and Coffee Street remains closed, the volume of traffic on the segment of Coffee Street south of Gerard Avenue will not increase appreciably, and bicycle lanes will not be needed on Coffee Street adjoining Pioneer Elementary School. Rather, bike sharrow markings and signs will be installed.

Pedestrians

The project could attract pedestrians from the neighborhoods to the north and west of the site. However, the project would be accompanied by standard City of Merced street frontage improvements that include sidewalks. As sidewalks already exist on the streets adjoining the project, pedestrian access to the site is adequate.

While a traffic signal would not be warranted at the Coffee Street/Gerard Street intersection based on traffic volume, an enhanced pedestrian crossing (e.g., signage, high visibility street markings, warning devices, etc.) should be installed to call attention to school pedestrian activity. This recommendation is reflected in Mitigation Measure TRANS-1a, and the implementation of this

measure would reduce impacts to a level of less than significant. In addition, MM AIR 7c requires a protected multi-use path on Gerard Avenue connecting Daffodil with the project's main driveway on Gerard Avenue; and, MM AIR 7b ensures the project has been designed to encourage a safe and convenient pedestrian environment, which would ensure that public sidewalks will be connected with on-site private sidewalks.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Implement Mitigation Measure TRANS-1a.

Level of Significance After Mitigation

Less than significant impact.

SECTION 4: CUMULATIVE EFFECTS

4.1 - Introduction

CEQA Guidelines Section 15130 requires the consideration of cumulative impacts within an EIR when a project's incremental effects are cumulatively considerable. Cumulatively considerable means that ". . . the incremental effects of an individual 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." In identifying projects that may contribute to cumulative impacts, the CEQA Guidelines allow the use of a list of past, present, and reasonably anticipated future projects, producing related or cumulative impacts, including those which are outside of the control of the lead agency.

In accordance with CEQA Guidelines Section 15130(b), ". . . the discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, the discussion need not provide as great [a level of] detail as is provided for the effects attributable to the project alone." The discussion should be guided by standards of practicality and reasonableness, and it should focus on the cumulative impact to which the identified other projects contribute rather than on the attributes of other projects that do not contribute to the cumulative impact.

The proposed project's cumulative impacts were considered in conjunction with other proposed and approved projects in the City of Merced. Table 4-1 provides a list of the other projects considered in the cumulative analysis.

Table 4-1: Cumulative Projects

Project	Characteristics	Location	Status
Towne Place Suites	97-unit hotel	Parsons Ave south of Childs Ave	Approved
Sierra Vista Subdivision	74 single-family dwelling units	North of Childs Ave east of Coffee St	Approved
Renaissance II	158 single-family dwelling units	North of Childs Ave east of Coffee St	Approved
The Crossings at River Oaks	277 single-family dwelling units	South of Childs Ave and east of Coffee St	Approved
Hartley Crossings	22 single-family dwelling units	South of Childs Ave and west of Coffee St	Approved
Tuscany East	47 single-family dwelling units	North of Childs Ave and east of Coffee St	Approved
Summerfield	252 single-family dwelling units	South of Childs Ave and west of Coffee St	Approved
Walmart Distribution Center	1.2 million sq ft warehouse/ distribution center	North of Gerard Ave and east of Campus Pkwy	Approved

Table 4-1 (cont.): Cumulative Projects

Project	Characteristics	Location	Status
Steiner GPA—North	19.5 acre retail center	West of Coffee St and south of Parsons Ave	Approved
Steiner GPA—South	7.8 acre retail center	West of Coffee St and south of Campus Pkwy	Approved

4.2 - Cumulative Impact Analysis

4.2.1 - Aesthetics

The analysis of cumulative aesthetics, light, and glare is focused on the southern portion of the City of Merced and the adjacent unincorporated area surrounding the project site. This is the area within view of the project and, therefore, the area most likely to experience changes in visual character or experience light and glare impacts. The City is located within Merced County, in the northern portion of the San Joaquin Valley, and the project area is characterized by suburban residential development bordered by agricultural uses at the city boundaries.

The proposed Merced Gateway Master Plan would guide the development of up to 178 multi-family dwelling units, up to 601,127 square feet of commercial uses, and a fire station site on 77 acres in the southern portion of the City of Merced. Much of the surrounding area was developed relatively recently in compliance with the General Plan and the City's current Municipal Code requirements related to design and visual character. Compliance with these standards, as well as the City's review and approval role in the planning process, has ensured a visually compatible and cohesive development pattern in the surrounding area. Therefore, there is currently no existing cumulatively significant visual aesthetic impact within the project area.

The proposed project would be developed in several phases over a 10-year period. The project would feature buildings as high as 60 feet above finished grade. Using site planning techniques such as setbacks, structure placement, and landscaping, the visual appearance of the proposed project would be compatible with its surroundings. Residential buildings would be allowed to up 60 percent lot coverage, while commercial buildings would be allowed up to 35 percent lot coverage. The building heights and lot coverage limits of the project would be similar to other developments in Merced.

Buildout of the Master Plan, in conjunction with cumulative development contemplated by the City of Merced General Plan, would result in changes to scenic vistas, views from State Route 99, visual character, and light and glare. However, the incremental changes that would occur relative to the baseline conditions would not be cumulatively considerable because of the extent and nature of existing development in Merced and that envisioned in the City's General Plan. Moreover, the Master Plan contains development standards to guide the shape and form of new development in a manner that would be compatible with surrounding land uses and the vision set forth in the City of Merced General Plan. Additionally, development proposals would be reviewed by the City to ensure

consistency with architectural standards and lighting requirements. Therefore, the Master Plan, in conjunction with other future development projects, would not have cumulatively considerable impacts associated with aesthetics, light, and glare.

4.2.2 - Agriculture

The geographic scope of the cumulative agriculture analysis includes the agricultural areas to the south and east of the project site. The project development will result in the loss of 77.5 acres of Farmland of Local Importance.

The EIR prepared for the City of Merced's General Plan acknowledged a significant and unavoidable impact related to the loss of prime farmland that would occur with General Plan buildout. This is an existing cumulatively significant impact that would exist even without the project. The project site is located within the City's Urban Influence zone and has been designated for urban uses by the General Plan, and the surrounding unincorporated areas of farmland have also been designated for urban uses by the City's General Plan. Therefore, the proposed project would not make a cumulatively considerable contribution to the loss of prime farmland that was not already accounted for by the General Plan EIR and associated Statement of Overriding Considerations adopted by the City.

4.2.3 - Air Quality/Greenhouse Gas Emissions

The analysis of cumulative air quality and greenhouse gas emissions impacts is focused on the San Joaquin Valley Area Air Basin (Air Basin), which is identical to the boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The Air Basin consists of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the western portion of Kern County.

The proposed project's construction emissions would not exceed SJVAPCD daily emissions thresholds. Construction activities associated with other development projects would make an inconsiderable contribution to cumulative emissions because the expected timing of those activities likely would overlap minimally with the proposed project, if at all. To the extent that construction periods do overlap, the SJVAPCD recommends that if it appears that the level of activity may cause an adverse impact, the Lead Agency should require the imposition of enhanced dust control measures. It is reasonable to assume that all other projects would impose similar mitigation, pursuant to SJVAPCD guidance. Therefore, it is reasonable to conclude that construction emissions from the proposed project would not combine with emissions from other development projects to cause cumulatively considerable air quality impacts.

The proposed project's operational emissions would not exceed the SJVAPCD's significance thresholds for criteria pollutants for the which the project region is in nonattainment, after mitigation. Note the SJVAPCD thresholds are designed to capture nearly all sources of emissions in the air basin, and thus are not only very conservative, but are intended to address a cumulative scenario. Because the proposed project's operational emissions would not exceed any SJVAPCD thresholds, its air emissions would be within the regional air emissions budget and, therefore, can be assumed not to be cumulatively considerable.

The project when combined with emissions from neighboring emission sources would not expose sensitive receptors to significant pollutant levels. The analysis provided in Section 3.3, Air Quality/Greenhouse Gas Emissions found that the emissions from the proposed project, the existing development on the project site, and from nearby roadways would not cause a localized exceedance of health based air quality standards for carbon monoxide and oxides of nitrogen. The analysis also demonstrated that cumulative PM_{10} and $PM_{2.5}$ emissions would not contribute significantly to existing violations of PM_{10} and $PM_{2.5}$ standards as defined by EPA significant impact level thresholds for these pollutants.

The project has no significant air quality impacts after mitigation. Other projects that result in similar impacts would be required to mitigate for their impact. Because the proposed project can mitigate all its air quality impact to a level of less than significant, it would have no significant cumulative impact on air quality.

Greenhouse gas emissions are inherently a cumulative impact, as no single project could produce a quantity of greenhouse gas emissions significant enough to influence global climate change.

The proposed project would be consistent with the City of Merced's CAP. In addition, the project is planned to improve pedestrian, bike, and transit orientation that would reduce overall growth in VMT generation in the City by increasing use of alternative modes of travel in the plan area. Therefore, the project would not significantly contribute to a cumulative greenhouse gas impact.

4.2.4 - Biological Resources

The analysis of cumulative biological resources impacts is focused on the project vicinity. Biological impacts tend to be localized; therefore, the area near the project area would be the area most affected by project activities (generally within a 0.5-mile radius). The Master Plan project site contains undeveloped land. Overall, the Master Plan area is considered a suburban environment because it is at the edge of the developed areas of the City of Merced and is bordered to the south and east by open, formerly agricultural land.

The burrowing owl (a California Species of Special Concern) and nesting birds protected by the Migratory Bird Treaty Act (MTBA) are the only special-status species with the potential to occur within the Master Plan area. Development activities associated with the Merced Gateway Master Plan, as well as other future development projects in the area, may impact burrowing owls and nesting birds. Standard pre-construction surveys and, if necessary, avoidance procedures would be required for any project with the potential to affect burrowing owl and nesting birds. Therefore, the proposed project, in conjunction with other future development projects, would not have cumulatively considerable impacts on biological resources.

4.2.5 - Cultural Resources

The analysis of cumulative cultural resources impacts is focused on the project vicinity. Cultural resource impacts tend to be localized because the integrity of any given resource depends on what occurs only in the immediate vicinity around that resource, such as disruption of soils; therefore, in addition to the project site itself, the area near the project site would be the area most affected by

project activities (generally within a 500-foot radius). No known impacts to historic, archaeological, or paleontological resources have occurred in the project vicinity as a result of past or current projects, and there is no existing cumulatively significant impact related to cultural resources.

The Master Plan area contains a mix of suburban development and undeveloped land. Development activities associated with the proposed project, as well as other future development projects in the Merced Gateway Master Plan area, would result in ground-disturbing activities that may encounter previously undiscovered cultural resources. Standard construction monitoring and, if necessary, avoidance or recovery procedures would be required for any project with the potential to adversely affect cultural resources. Therefore, the proposed project, in conjunction with other future development projects, would not have cumulatively considerable impacts associated with cultural resources.

4.2.6 - Geology, Soils, and Seismicity

The analysis of cumulative geology, soils, and seismicity impacts is focused on the project vicinity. Geologic, soil, and seismic impacts tend to be localized; therefore, the area near the project area would be the area most affected by project activities. Development in the project vicinity has not included any uses or activities which would result in geology, soils or seismicity impacts (such as mining or other extraction activities), and there is no existing cumulatively significant impact. The Master Plan area contains a mix of urban development and undeveloped land. There are no known geologic hazards within the Master Plan area (active faults, liquefaction zones, steep slopes, etc.). Development activities associated with the proposed project as well as other future development projects in the Master Plan area would be required to comply with building code standards for foundations and structures to ensure that buildings are adequately supported to withstand seismic events and abate any unstable soil conditions. In addition, other future development would be required to implement standard erosion control measures to ensure that ground-disturbing activities do not create off-site hazards. Therefore, the proposed project, in conjunction with other future development projects, would not have cumulatively considerable impacts associated with geology, soils, and seismicity.

4.2.7 - Hazards and Hazardous Materials

Adverse effects of hazards and hazardous materials tend to be localized; therefore, the area near the project area would be most affected by project activities. Hazards and hazardous materials are extensively regulated at the federal, state, and local levels. There are no land uses in the project vicinity that are known to utilize large quantities of hazardous materials or involve hazardous activities, and there is no existing cumulatively significant impact. The proposed project would not have significant impacts associated with hazards or hazardous materials, as there is no evidence of contamination from past uses or project characteristics that involve the routine handling of large quantities of hazardous materials. Other projects listed in Table 4-1 that have become contaminated from past uses, project characteristics that involve the routine handling of large quantities of hazardous materials, or airport incompatibility issues would be required to mitigate for their impacts. Because hazards and hazardous materials exposure is generally localized and development activities associated with the other projects listed in Table 4-1 may not coincide with the proposed project, this effectively precludes the possibility of cumulative exposure. Because the proposed

project impacts due to hazards and hazardous materials are less than significant, it would not have a cumulatively considerable contribution to any significant cumulative impact.

4.2.8 - Hydrology and Water Quality

The geographic scope of the cumulative hydrology and water quality analysis is the project vicinity, generally, areas within 0.5 mile of the project site for stormwater impacts due to natural drainage patterns, drainage infrastructure, and impervious surfaces, all of which contribute to limit the distance of stormwater flows. Hydrologic and water quality impacts tend to be localized; therefore, the area near the project site would be most affected by project activities. The nature and types of surrounding development, existing stormwater infrastructure, and regulatory requirements have ensured that no cumulatively significant impacts related to water pollutants or flooding exist within the project vicinity.

The project site is located within a 100-year flood hazard area. Mitigation Measure HYD-4 is proposed requiring building plans to comply with Merced Code of Ordinances Chapter 17.48, which includes requirements for anchoring, construction materials and methods, elevation, and floodproofing. Other projects that propose new development in flood hazard areas would be required to implement similar mitigation in accordance with adopted regulations. The required mitigation would reduce the project's contribution to any significant cumulative flooding impact to less than cumulatively considerable.

The proposed project would involve short-term construction and long-term operational activities that would have the potential to degrade water quality in downstream water bodies. Mitigation Measures HYD-1a and HYD-1b are proposed that would require implementation of various construction and operational water quality control measures that would prevent the release of pollutants into downstream waterways. Other projects that propose new development would be required to implement similar mitigation measures in accordance with adopted regulations. The required mitigation would reduce the project's contribution to any significant cumulative water quality impact to less than cumulatively considerable.

All other project-related hydrology impacts (e.g., groundwater and drainage) were found to be less than significant and did not require mitigation. Because all other project-related hydrology impacts are less than significant, it would not have a cumulatively considerable contribution to any significant cumulative impact for these impacts.

4.2.9 - Land Use

The analysis of cumulative land use impacts is focused on the City of Merced. Most of the City contains urban development. Development within the City of Merced is governed by the City's General Plan and Municipal Code, which ensure logical and orderly development and require discretionary review to ensure that projects do not result in land use impacts due to inconsistency with the General Plan and other regulations. As a result, there is no existing cumulatively significant land use impact. Therefore, the proposed project, in conjunction with other future development projects, would not have cumulatively considerable land use impacts.

4.2.10 - Noise

The analysis of cumulative noise impacts encompasses the ambient noise environment around the project site, the Merced Gateway Master Plan site, as well as roadways that would experience increases in traffic volumes from project-generated trips. The geographic scope of the cumulative noise analysis is the project vicinity, including surrounding sensitive receptors. Noise impacts tend to be localized; therefore, the area near the project site (approximately 0.25 mile) would be the area most affected by project activities. The cumulative noise impact analysis is guided by evaluating increases in ambient noise levels in the project vicinity relative to existing conditions. Construction noise would result in temporary increases in ambient noise levels, and mitigation is proposed that would require implementation of noise control measures during construction activities. Because construction would be temporary, ambient noise levels would not experience a permanent increase; therefore, no cumulatively considerable increase would occur. Other planned and approved projects would be required to evaluate construction noise impacts and implement mitigation, if necessary, to minimize noise impacts pursuant to local regulations. In addition, the timing of construction activities associated with other development projects would overlap minimally, if at all, with the proposed project. Furthermore, because noise is a highly localized phenomenon, even if construction activities did overlap in time with the proposed project, distance would diminish any additive effects. Construction noise would generally be limited to daytime hours and would be short-term in duration. Therefore, it is reasonable to conclude that construction noise from the proposed project would not combine with noise from other development projects to cause cumulatively significant noise impacts.

Vehicular trips generated by the proposed project would not cause ambient noise levels along any affected roadway segment to exceed acceptable noise standards for sensitive receptors under Existing Plus Project or 2035 conditions. Therefore, the proposed project would not have a cumulatively considerable impact related to increased ambient noise levels on nearby roadways.

Residential uses proposed within and adjacent to the Master Plan site would be exposed to noise levels above acceptable noise standards before mitigation. Mitigation is proposed that would require an 8-foot soundwall to be constructed along Gerard Avenue bordering the proposed residential land use portion of the project, and for an alternative ventilation system for the hotel and any residential development within the Master Plan site to allow windows to be kept closed so that interior noise standards would be met, reducing the impact to less than significant with mitigation.

The proposed project will not result in potentially significant construction and operational vibration to off-site and on-site sensitive receptors. Off-site and on-site sensitive receptors would not be exposed to significant sources of vibration, and impacts would not be cumulatively considerable. Because vibration is a highly localized phenomenon, there would be no possibility for vibration associated with the project to combine with vibration from other projects because of their distances from the project site. Therefore, the proposed project, in conjunction with other future development projects, would not have cumulatively considerable noise impacts.

4.2.11 - Public Services and Utilities

The analysis of cumulative public services and utilities impacts is focused on the City of Merced, and the service area of each of the provider serving the proposed project. Because of differences in the nature of the public service and utility topical areas, they are discussed separately. No existing cumulatively significant impacts have been identified for any of these areas, as all service providers are able to achieve the requisite level of service, capacity, or response times. The project was determined to have no impact on parks and recreation or schools and libraries.

Fire and Police Protection

The Merced Gateway Master Plan uses and other future development projects would increase demands for fire protection and police protection. The project would be required to provide development fees to finance capital improvements to the facilities to maintain acceptable service ratios and performance standards. Additionally, the Merced Gateway Master Plan would provide a fire station site. Future facilities would be sized to accommodate increased demands resulting from planned growth. The project will increase demands for police protection but will pay development fees to maintain acceptable service ratios and performance standards, as will other projects. Therefore, the proposed project, in conjunction with other future development projects, would not have cumulatively considerable impacts to fire protection, emergency medical services, and police protection.

Water

The geographic scope of the cumulative potable water analysis is the Merced Irrigation District (MID). Water supply impacts are analyzed in Section 3.10, Public Services and Utilities of this EIR, as well as the Water Supply Assessment (Appendix H) prepared for the project, which concluded that MID has adequate potable and recycled water supplies to serve the proposed project as well as other existing and future users. Therefore, there would be no existing cumulatively significant impact related to potable water supply.

The proposed project is estimated to demand 150 acre-feet per year (afy) of potable water for residential, commercial, and landscape uses. The City projects normal-year demand usage to increase from 23,660 afy in 2010 to 44,419 afy in 2030. The City's Urban Water Management Plan found that sufficient water supply is available to meet this demand, as well as the needs of the service area. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to water supply.

Wastewater

The geographic scope of the cumulative wastewater analysis is the City of Merced.

All future projects would be required to demonstrate that sewer service is available to ensure that adequate sanitation can be provided. The proposed project is estimated to generate 12,052 gallons of wastewater on a daily basis (0.012 million gallons per day [mgd]). The project site is served by the City of Merced's Wastewater Treatment Plant, which has a daily treatment capacity of 10.0 mgd. As such, the City's Wastewater Treatment Plant would be expected to accommodate the proposed

project's increase in effluent without needing to expand existing or construct new facilities, as the treatment capacity is sufficient to serve both the project and planned future development in the area. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to wastewater.

Storm Drainage

The geographic scope of the cumulative storm drainage analysis is municipal storm drainage in the project vicinity, as these are the facilities would receive the project's runoff.

All future development projects in the project vicinity would be required under existing regulations to provide drainage facilities that collect and detain runoff such that off-site releases are controlled and do not create flooding. The proposed project would install a storm drainage system consisting of street gutters, inlets, on-site and off-site basins, and underground piping that would ultimately convey runoff to the municipal storm drainage system. The drainage system would be designed to reduce the peak flows generated in the developed condition to the peak flows in the predevelopment condition. This would ensure that the proposed project would not contribute to downstream flooding conditions during peak storm events. As such, the proposed project would ensure that no net increase in stormwater would leave the project site during a peak storm event, and would avoid cumulatively significant stormwater impacts to downstream waterways at times when capacity is most constrained. Stormwater facilities in the project vicinity either have or will be required to have capacity to serve both the project and planned future development in the service area. Increases in runoff flow and volume from future development must be managed so that the post-project runoff does not exceed estimated pre-project rates and durations, in accordance with Municipal Regional Permit Provision C.3.g. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to storm drainage.

Solid Waste

The geographic scope of the cumulative solid waste analysis is the City of Merced. Future development projects would generate construction and operational solid waste and, depending on the volumes and end uses, would be required to implement recycling and waste reduction measures. The proposed project is anticipated to generate 3,268 cubic yards of solid waste during construction and 4,032 cubic yards annually during operations. The overall design capacity of the Highway 59 landfill that would serve the project is currently 30,012,352 cubic yards, of which 24,000,000 cubic yards of unused capacity is available as of 2014. Currently, the peak tonnage per day allowed is 1,500 tons per day, and the Highway 59 landfill is anticipated to have adequate capacity until at least 2030. Accordingly, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to solid waste.

Energy

The geographic scope of the cumulative energy analysis is the Pacific Gas & Electric (PG&E). PG&E's electrical service area consists of all or part of the 47 counties in California (including Merced County), while its natural gas service area consists of 39 counties in California comprising most of the northern and central portions of the State (including Merced County).

Future development projects in the PG&E service area would be required to comply with Title 24 energy efficiency standards. The proposed project would demand an estimated 10.5 million kilowatt-hours of electricity and 43.5 million cubic feet of natural gas on an annual basis. The proposed project's structures would be designed in accordance with Title 24, California's Energy Efficiency Standards for Residential and Nonresidential Buildings. These standards include minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., heating, ventilation, and air conditioning and water heating systems), indoor and outdoor lighting, and illuminated signs. The incorporation of the Title 24 standards into the project would ensure that the project would not result in the inefficient, unnecessary, or wasteful consumption of energy. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to energy consumption.

4.2.12 - Transportation

The analysis of cumulative transportation impacts is focused on the City of Merced. The proposed Master Plan uses are anticipated to generate 26,643 daily trips, 1,283 AM peak-hour trips, and 2,229 PM peak-hour trips at buildout. The proposed project, in conjunction with other development projects, would increase traffic volumes at intersections, roadways, and freeways within Merced under Background Plus Project conditions, Near term conditions and 2035 Cumulative Plus Project conditions. With the addition of trips generated by the proposed project, several intersections, roadways, and freeway facilities would operate at deficient levels of service. All feasible mitigation is proposed that would require improvements to intersections. However, many facilities are still projected to operate at unacceptable levels of service even after mitigation. As such, transportation impacts would be cumulatively significant, and this impact would be significant and unavoidable.

SECTION 5: ALTERNATIVES TO THE PROPOSED PROJECT

5.1 - Introduction

In accordance with CEQA Guidelines Section 15126.6, this Environmental Impact Report (EIR) contains a comparative impact assessment of alternatives to the proposed project. The primary purpose of this section is to provide decision makers and the general public with a reasonable number of feasible project alternatives that could attain most of the basic project objectives, while avoiding or reducing any of the project's significant adverse environmental effects. Important considerations for these alternatives analyses are noted below (as stated in CEQA Guidelines Section 15126.6).

- An EIR need not consider every conceivable alternative to a project;
- An EIR should identify alternatives that were considered by the lead agency, but rejected as infeasible during the scoping process;
- Reasons for rejecting an alternative include:
  - Failure to meet most of the basic project objectives;
  - Infeasibility; or
  - Inability to avoid significant environmental effects.

5.1.1 - Significant Unavoidable Impacts

The project would result in the following significant unavoidable impacts:

- Traffic Impacts: The project would result in unacceptable operations at twelve intersections under Existing Plus Project Conditions, Near-Term conditions, or Cumulative Conditions. Mitigation is proposed; however, it would not fully reduce project impacts to a level of less than significant. Therefore, the residual level of significance at the following intersections or facilities would remain significant and unavoidable in the Cumulative Condition:
  - Campus Parkway/Coffee Street (12)
  - Campus Parkway/Central Access (16)
  - Mission Avenue/State Route 99 (SR-99) Southbound ramps (10)
  - Mission Avenue/SR-99 Northbound ramps (11)
  - Coffee Street/Project Access central (15)
  - Coffee Street/Project Access south (18)
  - Travel speed on Mission Avenue/Campus Parkway

5.1.2 - Alternatives to the Proposed Project

The three alternatives to the proposed project analyzed in this section are as follows:

- **No Project Alternative:** The proposed project would not be pursued and the project site would remain undeveloped for the foreseeable future.
- **General Plan Circulation Element Build-out Alternative:** The Circulation Element Alternative consists of building the proposed Merced Gateway Master Plan with the same uses and

square footage, but incorporating the roadway improvements envisioned in the Merced General Plan for access to the project site instead of those proposed under the project. Specifically, this alternative would not involve an amendment to the Circulation Element to eliminate a planned extension of Pluim Drive (collector level street) along the east side of the site and to add right turn in and out driveways along the Campus Parkway Expressway.

- **Less Intense Plan Alternative:** This alternative would reduce the commercial use on the site by 25 percent, or 150,281 square feet (from 601,127 square feet to 450,846 square feet), and would reduce the number of multi-family housing units from 178 to 134. The 150,281 square feet removed from commercial development and the undeveloped land in the residential parcel would be maintained as open space and public areas throughout the project site.

The alternatives to the proposed project are analyzed below. These analyses compare the proposed project and each individual project alternative. In several cases, the description of the impact may be the same under each alternative when compared with the CEQA Thresholds of Significance (i.e., both the project and the alternative would result in a less than significant impact). The actual degree of impact may be slightly different between the proposed project and each alternative, and this relative difference is the basis for a conclusion of greater or lesser impacts.

5.2 - Project Objectives

As stated in Section 2, Project Description, the objectives of the proposed project are to:

- Positively contribute to the local economy through new capital investment, creation of new employment opportunities, expansion of the tax base, and increased retail offerings.
- Reinforce Merced's status as a regional retail node and employment center by increasing commercial offerings.
- Develop regional-serving and highway oriented commercial uses on a highly visible site near SR-99 in order to cater to local residents and travelers.
- Promote residential and economic growth in accordance with the goals and policies set forth in the Merced Vision 2030 General Plan.
- Develop new multi-family residential uses in southeast Merced to provide additional affordable housing options in a growing part of the City.
- Design a site plan that provides convenient internal circulation, while also minimizing access conflicts between the residential and commercial uses.
- Reserve a site for a future public safety facility in the interests of ensuring that adequate coverage can be provided in the future.

5.3 - Alternative 1—No Project Alternative

CEQA requires EIRs to evaluate a "No Project alternative," which is defined as the "circumstance under which the project does not proceed." Under the No Project/No Build Alternative, the Merced

Gateway Master Plan would not be implemented. The General Plan and zoning designations would remain the same, no planned development designation would be applied, and no development would occur within the Master Plan boundaries. The Plan Area would thus be left in its undeveloped state for the foreseeable future.

5.3.1 - Impact Analysis

The No Project/No Build Alternative would not advance any of the project objectives and the project site would remain undeveloped for the foreseeable future. No disturbance or new development would occur on the project site, thereby eliminating the potential for impacts associated with aesthetics, light and glare; air quality and greenhouse gas emissions; biological resources; cultural resources; hazards and hazardous materials; hydrology and water quality; land use; noise; public services and utilizes; and transportation. Accordingly, this alternative would avoid all of the proposed project's significant impacts (including significant and unavoidable impacts), as well as the need to implement any mitigation measures.

5.3.2 - Conclusion

The No Project Alternative would avoid the proposed project's significant and unavoidable impacts and would have less impact on all environmental topical areas. However, this alternative would not advance any of the project objectives, including those related to promoting economic development, providing new housing opportunities, expanding the tax base, or reserving a site for a fire station to expand fire protection services to this area of Merced.

5.4 - Alternative 2 –Circulation Element Alternative

The Circulation Element Alternative consists of building the Merced Gateway Master Plan with the same uses and square footage, but incorporating the roadway improvements envisioned in the Merced General Plan for access to the project site instead of the roadway improvements proposed under the project.

The General Plan assumes that the roadblock on Coffee Street north of Parsons Avenue would remain in place, and that movements at the Campus Parkway/Coffee Street intersection would be limited (i.e., no North-south cross traffic or left turns.)

The Circulation Element Alternative also assumes that the Campus Parkway/Pluim Drive intersection will be created with separate left turn, right turn and through lanes on each new approach, and that traffic will be controlled by a traffic signal.

The purpose of this alternative is to evaluate whether traffic impacts could be reduced by using the Circulation Element scenario for site access in comparison to the proposed project. The Traffic Impact Analysis prepared by K.D. Anderson and Associates (Appendix H), provides a full project-level analysis of this alternative, including impacts and mitigation measures. Section 3.11 Transportation of this EIR includes a detailed discussion of this analysis; a summary is provided in this section for comparison purposes. Potential impacts to air quality, greenhouse gas, and noise were analyzed

based on the findings of the traffic report, using the number of trips generated under the Circulation Element Scenario.

5.4.1 - Impact Analysis

Aesthetics, Light, and Glare

The Circulation Element Alternative would result in the same type and amount of development as the proposed Master Plan. The proposed project's impacts on scenic vistas, State Scenic Highways, visual character, and light and glare were found to be less than significant and did not require mitigation. The Circulation Element Alternative would also yield less than significant impacts on these areas because the buildout of the plan would be the same. Therefore, the Circulation Element Alternative would have impacts on aesthetics, light, and glare similar to the proposed project.

Agriculture Resources

The Circulation Element Alternative would result in the same type and amount of development as the proposed Master Plan. The proposed project's impacts on conversion of farmland, Williamson Act contracts or farmland zoning, or other changes resulting in farmland conversion were determined to be less than significant after mitigation. The Circulation Element Alternative would also yield less than significant impacts on these areas because the buildout of the plan would be the same. Therefore, the Circulation Element Alternative would have impacts on conversion of farmland, Williamson Act contracts or farmland zoning, or other changes resulting in farmland conversion similar to the proposed project.

Air Quality/Greenhouse Gas Emissions

The Circulation Element Alternative would result in the same type and amount of development as the proposed Master Plan. The proposed project's impacts on construction and operational air quality and greenhouse gas emissions were determined to be less than significant with mitigation. The Circulation Element Alternative would also yield less than significant impacts on these areas because the buildout of the plan would be the same. However, the Circulation Element Alternative causes fewer instances of traffic congestion, so it would produce fewer pollutant emissions form mobile sources. Therefore, although both alternatives would result in less than significant impacts on air quality and greenhouse gases, the Circulation Element Alternative would create fewer air quality and greenhouse gas emissions and thus would be considered to have fewer impacts than the proposed project.

Biological Resources

The Circulation Element Alternative would have the same potential to impact special-status species as the proposed Merced Gateway Master Plan, since its boundaries and extent of development would be the same. These effects would be less than significant. As such, this alternative would require mitigation similar to the proposed project, which would reduce potential impacts to a level of less than significant. Therefore, this alternative would have biological resources impacts similar to the proposed project.

Cultural Resources

The Circulation Element Alternative would have the potential to result in adverse impacts to undiscovered cultural resources during subsurface earthwork activities and, thus, would implement mitigation similar to the proposed project to reduce impacts to a level of less than significant. Overall, this alternative would have cultural resources impacts similar to the proposed project.

Hazards and Hazardous Material

The proposed Merced Gateway Master Plan was determined to have less than significant impacts related to hazards and hazardous materials. The Circulation Element Alternative would develop the same area of land and would therefore have a level of hazards and hazardous materials impacts similar to the proposed project, including emergency access hazards.

Hydrology and Water Quality

The Circulation Element Alternative would have the potential to introduce new sources of water pollution or increased runoff that could result in water quality impacts. As such, this alternative would implement mitigation similar to the proposed Master Plan to ensure that water pollution prevention and drainage measures are in place to reduce impacts to a level of less than significant. Therefore, this alternative would have hydrology and water quality impacts similar to the proposed project.

Land Use

The Circulation Element Alternative would result in the same type and amount of development as the proposed Master Plan, and would still require a General Plan Amendment, but this would not encompass an amendment to the Circulation Element. This alternative would generally require the same entitlements as the proposed project, and therefore, would yield similar conclusions in terms of land use. Additionally, the uses developed under this alternative would have the same physical characteristics and end uses as the proposed project, and therefore would yield a similar compatibility finding with the Merced General Plan.

Noise

The buildout of the Circulation Element Alternative would be the same as the proposed plan, and its construction would have similar noise impacts. Operational noise from vehicles on the roadways would be the same, because the same number of trips would be generated and the same land uses would be built out.

Public Services and Utilities

The Circulation Element Alternative would result in the same type and amount of development as the proposed Master Plan and therefore would have the same less than significant impacts on Public Services and Utilities as the proposed project.

Transportation

The Circulation Element Alternative would build out the same amount and type of development as the proposed project and therefore would generate the same amount of vehicle trips. However, these trips would be distributed on the roadway diagram shown in the Circulation Element of the Merced General Plan, as described above and analyzed in Section 3.11, Transportation. Under this alternative, the Circulation Element of the General Plan would not be amended to eliminate a planned extension of Pluim Drive (collector level street) along the east side of the site and to add right turn in and out driveways along the Campus Parkway Expressway.

Table 5-1 summarizes the significant unavoidable impacts to intersection function, after mitigation, for just the Cumulative Plus Project scenario using the Master Plan roadway plan and improvements, and the same intersections under the Circulation Element Alternative.

The Circulation Element Alternative, with proposed mitigations, would result in zero intersections operating at level of service (LOS) E or F in the Existing Plus Merced Gateway condition and two in the 2035 Cumulative condition.

This level of impact would be less than the project as proposed, with mitigation, which would result in three intersections operating at level of service (LOS) E or F in the Existing Plus Merced Gateway condition, six intersections in the Near term condition (EPAP with Project), and six intersections in the 2035 cumulative condition. After mitigation, the proposed project would still result in significant and unavoidable impacts at six intersections.

Table 5-1: Comparison of Cumulative Plus Project Impacts under the Circulation Element Alternative and the Proposed Project

Affected Facility	Level of Service with Proposed Project	Level of Service with the Circulation Element Alternative
Campus Parkway/Coffee Street (12)	E (AM) F (PM) F (Saturday)	B (AM) C (PM) D (Saturday)
Campus Parkway/Central Access (16)	A (AM) D (AM) F (AM)	— — —
Mission Avenue/SR-99 Southbound ramps (10)	D (AM) E (PM) F (Saturday)	D (AM) C (PM) D (Saturday)
Mission Avenue/SR-99 Northbound ramps (11)	D (AM) E (PM) E (Saturday)	D (AM) C (PM) E (Saturday)
Coffee Street/Central Access (15)	A (AM) A (PM) F (Saturday)	A (AM) C (PM) F (Saturday)

Table 5-1 (cont.): Comparison of Cumulative Plus Project Impacts under the Circulation Element Alternative and the Proposed Project

Affected Facility	Level of Service with Proposed Project	Level of Service with the Circulation Element Alternative
Coffee Street/Project Access south (18)	A (AM) F (PM) F (Saturday)	A (AM) A (PM) A (Saturday)
Travel speed on Mission Avenue-Campus Parkway (WB/EB)	F/D (AM) E/F (PM) D/E (Saturday)	C/E (AM) D/E (PM) C/F (Saturday)

Therefore, the Circulation Element Alternative would have reduced traffic impacts relative to the proposed project.

5.4.2 - Conclusion

The Circulation Element Alternative would have fewer significant and unavoidable impacts to traffic than the proposed project, although it would result in significant, unavoidable impacts at two intersections (compared with six intersections of the proposed project). All other environmental topical areas would have similar impacts. This alternative would advance all of the project objectives.

5.5 - Alternative 3—Less Intense Plan Alternative

This alternative would reduce the commercial use on the site by 25 percent, or 150,281 square feet (from 601,127 square feet to 450,846 square feet), and would reduce the number of multi-family housing units from 178 to 134. The 150,281 square feet removed from commercial development and the undeveloped land in the residential parcel would be maintained as open space and public areas throughout the project site. Table 5-2 lists the Less Intense Plan Alternative uses and compares them to the proposed project. The planning areas described correspond to the planning areas comprising the Merced Gateway Master Plan. The purpose of the Less Intense Plan Alternative is to evaluate a project alternative that develops the same end uses but with less square footage in order to lessen the severity of impacts associated with air quality/greenhouse gases, noise public services and utilities, and transportation. Although this would reduce the total number of trips generated by commercial uses onto the local roadway system by 25 percent, it would still result in unacceptable level of service on surrounding roadways, specifically Coffee Street.

Table 5-2: Less Intense Plan Alternative

Scenario	Planning Area	Use
Less Intense Plan Alternative	Parcel 1	Fire Station—9,209 sq ft
	Parcel 2—Residential Parcel	134 multi-family units
	Parcel 3 North Parcel	289,151 sq ft commercial
	Parcel 4 South Parcel	181,944 sq ft commercial
	Total	9,209 sq ft fire station 134 multi-family units 450,846 sq ft commercial
Proposed Project	Total	9,209 sq ft fire station 178 multi-family units 601,127 sq ft commercial
Difference	**Total**	(44 multi-family units) (150,281 sq ft commercial)
Note: sq ft = square feet		

5.5.1 - Impact Analysis

Aesthetics, Light, and Glare

The Less Intense Plan Alternative would result in a reduction of 150,281 square feet of commercial structures and 44 multifamily dwellings relative to the proposed Master Plan. The proposed project's impacts on scenic vistas, State Scenic Highways, visual character, and light and glare were found to be less than significant and did not require mitigation. The Less Intense Plan Alternative would also yield less than significant impacts on these areas because of the reduction in plan area and buildout potential. Therefore, the Less Intense Plan Alternative would have impacts on aesthetics, light, and glare similar to the proposed project.

Agriculture Resources

The proposed project had less than significant impacts to agricultural resources after mitigation. Because the Less Intense Plan Alternative would develop roughly the same land area with new uses, the impact would be the same as the proposed project.

Air Quality/Greenhouse Gas Emissions

The Less Intense Plan Alternative would result in less construction activity and 6,660 fewer daily vehicle trips, which would have corresponding reductions in the severity of construction and operational air quality and greenhouse gas emissions. Although this alternative would still be required to implement mitigation measures similar to the proposed project, the reduction in development potential and vehicle trips would reduce the severity of air quality and greenhouse gas impacts. Therefore, this alternative would have less impact on air quality and greenhouse gas than the proposed project.

Biological Resources

The Less Intense Plan Alternative would have the same potential to impact special status species as the proposed Master Plan, since its boundaries would remain the same and a similar amount of the site would be disturbed. As such, this alternative would require mitigation similar to the proposed project, which would reduce potential impacts to a level of less than significant. Therefore, this alternative would have biological resources impacts similar to the proposed project.

Cultural Resources

The Less Intense Plan Alternative has the potential to result in adverse impacts to undiscovered cultural resources during subsurface earthwork activities and, thus, would implement mitigation similar to the proposed project to reduce impacts to a level of less than significant. Overall, this alternative would have cultural resources impacts similar to the proposed project.

Hazards and Hazardous Material

Impacts from hazards and hazardous materials are less than significant for the proposed project. Because the Less Intense Plan Alternative has the same boundaries as the proposed plan and would involve the same uses, this alternative would have hazards and hazardous materials impacts similar to the proposed project.

Hydrology and Water Quality

The Less Intense Plan Alternative would have the potential to introduce new sources of water pollution or increased runoff that could result in water quality impacts. As such, this alternative would implement mitigation similar to the proposed Master Plan to ensure that water pollution prevention and drainage measures are in place to reduce impacts to a level of less than significant. Therefore, this alternative would have hydrology and water quality impacts similar to the proposed project.

Land Use

The Less Intense Plan Alternative would have the same characteristics and land use designations as the proposed Master Plan, and would have the same or less than significant impacts as the proposed project.

Noise

The Less Intense Plan Alternative would result in less construction activity and 6,660 fewer daily vehicle trips, which would have corresponding reductions in the severity of construction and operational noise impacts. Although this alternative would still be required to implement mitigation measures similar to the proposed project, the reduction in development potential and vehicle trips would reduce the severity of noise impacts. Therefore, this alternative would have less impact on noise than the proposed project.

Public Services and Utilities

The Less Intense Plan Alternative would result in a reduction in development potential and yield fewer new residents and employees. Thus, this alternative would have a corresponding reduction in demand for public services and utilities. Although the proposed Master Plan's public services and

utilities impacts were found to be less than significant and did not require mitigation, this alternative would have less impact on public services and utilities than the proposed project.

Transportation

The Less Intense Plan Alternative would result in a reduction of in development potential. Table 5-3 summarizes the daily and peak-hour trip generation associated with the Less Intense Plan Alternative. As shown in the table, this alternative would yield 19,982 daily trips (6,660 less than the proposed project) 962 AM peak-hour vehicle trips, 1,267 PM peak-hour vehicle trips, and 2,400 Saturday peak-hour trips. The trip reduction would contribute fewer vehicle trips to intersections and other roadway facilities that would operate at unacceptable levels. Although this alternative would not necessarily avoid the significant and unavoidable transportation impacts, it would lessen the severity of these impacts. As with the proposed Master Plan, this alternative would implement similar mitigation measures in the form of traffic improvements.

Table 5-3: Peak Hour and Saturday Trip Comparison, Less Intense Plan Alternative

Scenario	Use	Trip Generation		
		AM	PM	Saturday
Less Intense Plan Alternative	134 units residential 450,856 sq ft commercial	962	1,267	2,400
Proposed Project	178 units residential 601,127 sq ft commercial	1,283	1,690	3,200
Difference		(321)	(423)	(800)

5.5.2 - Conclusion

The Less Intense Plan Alternative would lessen the severity of, but would not avoid, the significant and unavoidable transportation impacts associated with the proposed project. Additionally, the Less Intense Plan Alternative would lessen the severity of several of the project's potentially significant impacts that can be reduced to a level of less than significant with mitigation (e.g., air quality, noise, and utilities).

The Less Intense Plan Alternative would advance all of the project objectives, but to a lesser degree than the proposed project because of the reduction in new dwelling units and nonresidential development. This includes objectives related to promoting economic development, providing new housing opportunities, and expanding the tax base; and establishing a land use plan to guide development within the Master Plan area.

5.6 - Environmentally Superior Alternative

The qualitative environmental effects of each alternative in relation to the proposed project are summarized in Table 5-4.

Table 5-4: Summary of Alternatives

Environmental Topic Area	No Project	Circulation Element Alternative	Less Intense Plan Alternative
Aesthetics, Light, and Glare	Less Impact	Similar Impact	Similar Impact
Agriculture Resources	Less Impact	Similar Impact	Similar Impact
Air Quality/Greenhouse Gas Emissions	Less Impact	Less Impact	Less Impact
Biological Resources	Less Impact	Similar Impact	Similar Impact
Cultural Resources	Less Impact	Similar Impact	Similar Impact
Hazards and Hazardous Materials	Less Impact	Similar Impact	Similar Impact
Hydrology and Water Quality	Less Impact	Similar Impact	Similar Impact
Land Use	Less Impact	Similar Impact	Similar Impact
Noise	Less Impact	Similar Impact	Less Impact
Public Services and Utilities	Less Impact	Similar Impact	Similar Impact
Transportation	Less Impact	Less Impact	Less Impact
Source: FirstCarbon Solutions, 2016.			

CEQA Guidelines Section 15126(e)(2) requires an EIR to identify an environmentally superior alternative. If the No Project Alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives.

As shown in Table 5-3, the No Project Alternative is the environmentally superior alternative, as there would be no development within the Master Plan area.

Of the two remaining alternatives, the Circulation Element Alternative would create significant and unavoidable impacts at significantly fewer intersections than the proposed project (two intersections versus six intersections). The Less Intense Plan Alternative would lessen the impacts of the proposed project, but would still result in significant and unavoidable impacts at all six intersections affected by the proposed project.

Therefore, the Circulation Element Alternative is the environmentally superior alternative. Even if the Less Intense Plan Alternative would reduce impacts at all intersections to less than significant, the Circulation Element Alternative would not require amendment of the General Plan Circulation Element and would meet more of the other project objectives.

5.7 - Alternatives Rejected From Further Consideration

5.7.1 - Alternative Location

CEQA Guidelines Section 15126.6(f)(2) sets forth considerations to be used in evaluating an alternative location. The section states that the "key question" is whether any of the significant effects of the project would be avoided or substantially lessened by relocating the project. The

CEQA Guidelines identify the following factors that may be taken into account when addressing the feasibility of an alternative location:

1) Site suitability
2) Economic viability
3) Availability of infrastructure
4) General Plan consistency
5) Other plans or regulatory limitations
6) Jurisdictional boundaries
7) Whether the project applicant can reasonably acquire, control, or otherwise have access to the alternative site

The CEQA Guidelines establishes that only locations that would accomplish this objective should be considered as alternative locations for the proposed project.

There are no other locations that would reduce the significant and unavoidable air, greenhouse gas and traffic impacts that would result from the implementation of the project. There is nothing appreciably closer to the freeway off-ramps than this site in Merced and the surrounding area. Thus, any other location would generate the same number of vehicle trips but the miles travelled would be equal or greater, which would not reduce air quality or greenhouse gas impacts.

SECTION 6: OTHER CEQA CONSIDERATIONS

6.1 - Significant Unavoidable Impacts

CEQA Guidelines Section 15126.2(a)(b) requires an EIR to identify and focus on the significant environmental effects of the proposed project, including effects that cannot be avoided if the proposed project were implemented.

This section describes significant impacts, including those that can be mitigated but not reduced to a level of less than significant. Where there are impacts that cannot be alleviated without imposing a project alternative, their implications, and the reason why the project is being proposed, notwithstanding their effect, is described. With implementation of the proposed project, the following significant effects that cannot be avoided would occur. Each significant unavoidable impact is discussed below.

- **Traffic Impacts:** The project would result in unacceptable operations at eight facilities under Existing Plus Project Conditions, Near-Term conditions, or Cumulative Conditions. Mitigation is proposed; however, it would not fully reduce project impacts to a level of less than significant. Therefore, the residual level of significance at the following intersections would remain significant and unavoidable:
  - Campus Parkway/Coffee Street
  - Campus Parkway/Central access
  - Childs Avenue/Parsons Avenue
  - Mission Avenue/State Route 99 (SR-99) Southbound ramps
  - Mission Avenue/SR-99 Northbound ramps
  - Coffee Street/Project Access central
  - Coffee Street/Project Access south

  Mission Avenue-Campus Parkway between SR-99 and Coffee Street

6.2 - Growth-Inducing Impacts

There are two types of growth-inducing impacts that a project may have: direct and indirect. To assess the potential for growth-inducing impacts, the project's characteristics that may encourage and facilitate activities that individually or cumulatively may affect the environment must be evaluated (CEQA Guidelines Section 15126.2(d)).

Direct growth-inducing impacts occur when the development of a project imposes new burdens on a community by directly inducing population growth, or by leading to the construction of additional developments in the same area. Also included in this category are projects that remove physical obstacles to population growth (such as a new road into an undeveloped area or a wastewater treatment plant with excess capacity that could allow additional development in the service area). Construction of these types of infrastructure projects cannot be considered isolated from the development they facilitate and serve. Projects that physically remove obstacles to growth, or projects

that indirectly induce growth may provide a catalyst for future unrelated development in an area such as a new residential community that requires additional commercial uses to support residents.

The project site is currently located within the Merced city limits and is contemplated to support future residential and commercial development by the City of Merced Vision 2030 General Plan. The proposed project would reduce the residential development potential by 12 acres and increase the commercial development potential by 12 acres. However, the applicant is proposing a 178-unit, high-density residential development on the residential portion of the project site, which would maintain the anticipated unit count assumed by the General Plan for the project site. Thus, there would be no change in the population growth potential from what is currently contemplated by the General Plan.

6.3 - Mandatory Findings of Significance

The environmental effects of the proposed project are summarized in Section ES, Executive Summary, and are analyzed in detail in Section 3, Environmental Impact Analysis of this EIR.

As mandated by the CEQA Guidelines, the EIR must address any significant irreversible environmental change that would result from implementation of the proposed project. Specifically, pursuant to the CEQA Guidelines (Section 15126.2(c)), such an impact would occur if:

- The project would involve a large commitment of nonrenewable resources;
- Irreversible damage can result from environmental accidents associated with the project; and
- The proposed consumption of resources is not justified (e.g., the project results in the wasteful use of energy).

The proposed project consists of the development of new residential and commercial uses on 77.5 acres. Development activities would involve the construction of the new uses and associated urban infrastructure. Construction debris recycling practices would be expected to allow for the recovery and reuse of building materials such as concrete, lumber, and steel and would limit disposal of these materials, some of which are non-renewable.

Day-to-day activities would involve the use of non-renewable resources such as petroleum and natural gas during operations. The new residential uses would be required to adhere to the latest adopted edition of the California Building Standards Code, which includes a number of standards that would reduce energy demand, water consumption, wastewater generation, and solid waste generation that would collectively reduce the demand for resources. This would result in the emission and generation of less pollution and effluent and lessen the severity of corresponding environmental effects. Although the project would result in an irretrievable commitment of non-renewable resources, the commitment of these resources would not be significantly inefficient, unnecessary, or wasteful. Furthermore, the proposed residential uses do not have the potential to cause significant environmental accidents through releases into the environment, as they would not handle large quantities of hazardous materials. The proposed fuel station would be subject to regulatory oversight to ensure the safe transport and storage of fuel. None of the other commercial uses would handle or store large quantities of hazardous materials.

6.4 - Energy Conservation

Public Resources Code Section 21100(b)(3) and CEQA Guidelines Section 15126.4 require EIRs to describe, where relevant, the wasteful, inefficient, and unnecessary consumption of energy caused by a project. In 1975, largely in response to the oil crisis of the 1970s, the State Legislature adopted Assembly Bill (AB) 1575, which created the California Energy Commission (CEC). The statutory mission of the CEC is to forecast future energy needs, license thermal power plants of 50 megawatts or larger, develop energy technologies and renewable energy resources, plan for and direct State responses to energy emergencies, and—perhaps most importantly—promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended Public Resources Code Section 21100(b)(3) to require EIRs to consider the wasteful, inefficient, and unnecessary consumption of energy caused by a project. Thereafter, the State Resources Agency created Appendix F of the CEQA Guidelines. Appendix F is an advisory document that assists EIR preparers in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy. For the reasons set forth below, this EIR concludes that the proposed project will not result in the wasteful, inefficient, and unnecessary consumption of energy, will not cause the need for additional natural gas or electrical energy-producing facilities, and, therefore, will not create a significant impact on energy resources.

6.4.1 - Regulatory Setting

Federal and state agencies regulate energy use and consumption through various means and programs. At the federal level, the United States Department of Transportation, the United States Department of Energy, and the United States Environmental Protection Agency are three federal agencies with substantial influence over energy policies and programs. Generally, federal agencies influence and regulate transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy-related research and development projects, and through funding for transportation infrastructure improvements. At the State level, the California Public Utilities Commission (CPUC) and the CEC are two agencies with authority over different aspects of energy. The CPUC regulates privately owned utilities in the energy, rail, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes and funds energy efficiency programs, and adopts and enforces appliance and building energy efficiency standards. California is exempt under federal law from setting State fuel economy standards for new on-road motor vehicles. Some of the more relevant federal and State energy-related laws and plans are discussed below.

Federal Energy Policy and Conservation Act

The Federal Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the United States Department of Transportation, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has

been 20.7 miles per gallon. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is not determined for each individual vehicle model; rather, compliance is determined on the basis of each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The Corporate Average Fuel Economy (CAFE) program, which is administered by United States Environmental Protection Agency, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The United States Environmental Protection Agency calculates a CAFE value for each manufacturer, based on city and highway fuel economy test results and vehicle sales. On the basis of the information generated under the CAFE program, the United States Department of Transportation is authorized to assess penalties for noncompliance. In the course of its over 30-year history, this regulatory program has resulted in vastly improved fuel economy throughout the nation's vehicle fleet.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs) such as ABAG were required to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values that were to guide transportation decisions in that metropolitan area. The planning process for specific projects would then address these policies. Another requirement was to consider the consistency of transportation planning with federal, State, and local energy goals. Through this requirement, energy consumption was expected to become a decision criterion, along with cost and other values that determine the best transportation solution.

The Transportation Equity Act for the 21st Century (TEA-21)

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

State of California Energy Plan

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. 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 providing assistance to public agencies and fleet operators, encouraging urban designs that reduce vehicle miles traveled, and accommodating pedestrian and bicycle access.

Title 24, Energy Efficiency Standards

Title 24, which was promulgated by the CEC in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption, provides energy efficiency standards for residential and nonresidential buildings. According to the CEC, since the energy efficiency standards (Standards) went into effect in 1978, it is estimated that California residential and nonresidential consumers have reduced their utility bills by at least $15.8 billion. The Standards are periodically updated on an approximately three-year cycle. The current 2013 Standards improve upon the 2008 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2013 Standards went into effect July 1, 2014. In Merced County, the annual consumption of electricity has dropped from 3,305 million kilowatt-hours (kWh) in 2012 to 3,020 million kWh in 2014.

Because the adoption of Title 24 post-dates the adoption of AB 1575, it has generally been the presumption throughout the State that compliance with Title 24 (as well as compliance with the federal and State regulations discussed above) ensures that projects will not result in the inefficient, wasteful, and unnecessary consumption of energy. As is the case with other uniform building codes, Title 24 is designed to provide certainty and uniformity throughout the State while ensuring that the efficient and non-wasteful consumption of energy is carried out through design features. Large infrastructure transportation projects that cannot adhere to Title 24 design-build performance standards may, depending on the circumstances, undertake a more involved assessment of energy conservation measures in accordance with some of the factors set forth in Appendix F of the CEQA Guidelines. As an example, pursuant to the California Department of Transportation CEQA implementation procedures and FHWA Technical Advisory 6640.8A, a detailed energy study is generally only required for large-scale infrastructure projects. However, for the vast majority of residential and nonresidential projects, adherence to Title 24 is deemed necessary to ensure that no significant impacts occur from the inefficient, wasteful, and unnecessary consumption of energy. As a further example, the adoption of federal vehicle fuel standards, which have been continually improved since their original adoption in 1975, have also protected against the inefficient, wasteful, and unnecessary use of energy.

According to the CEC, reducing energy use has been a benefit to all. Building owners save money, Californians have a more secure and healthy economy, the environment is less negatively impacted, and our electrical system can operate in a more stable state. For each year of construction, in both newly constructed buildings and alterations to existing buildings, the current 2013 Standards (for residential and nonresidential buildings) are expected to reduce the growth in electricity use by 555.5 gigawatt-hours per year (GWh/y) and to reduce the growth in peak electrical demand by 148.4 MW. The 2013 Standards are also expected to reduce the growth in natural gas use by 7.04 million therms per year (therms/y) beyond the prior 2008 Standards. Overall, the 2013 Standards will use 25% less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 Standards.

Over time, the energy savings will accumulate as the Standards affect each subsequent year of construction. The savings result from changes to both the residential and nonresidential standards. The Standards affect both newly constructed buildings as well as alterations to existing buildings. These savings result from retrofit insulation requirements for existing roofs and the energy requirement for renovated lighting systems to meet the new 2013 energy requirements.

In many parts of the world, the wasteful and poorly managed use of energy has led to oil spills, acid rain, smog, and other forms of environmental pollution that have ruined the natural beauty people seek to enjoy. California is not immune to these problems, but the CEC-adopted appliance standards, building standards, and utility programs that promote efficiency and conservation have gone a long way toward maintaining and improving environmental quality. Other benefits include reduced destruction of natural habitats, which, in turn, helps protect wildlife, plants, and natural systems.

Many experts believe that burning fossil fuel is a major contributor to global warming; carbon dioxide is being added to an atmosphere already containing 25 percent more than it did two centuries ago. Carbon dioxide and other greenhouse gases create an insulating layer around the Earth that leads to global climate change. CEC research shows that most of the sectors of the State economy face significant risk from climate change, including agriculture, forests, and the natural habitats of a number of indigenous plants and animals.

Scientists recommend that actions be taken to reduce emissions of carbon dioxide and other greenhouse gases. While adding scrubbers to power plants and catalytic converters to cars are steps in the right direction (both of which are currently enforced as part of existing regulatory schemes), the use of energy-efficient standards can be effective actions to limit the carbon dioxide that is emitted into the atmosphere. According to the CEC, using energy efficiently, in accordance with Title 24 Energy Efficiency standards, is a proven, far-reaching strategy that can and does present an important contribution to the significant reduction of greenhouse gases.

In fact, the National Academy of Sciences has urged the country to follow California's lead on such efforts, and it has recommended that energy efficiency building codes modeled after Title 24 be adopted nationwide. The CEC's Title 24 program has played a vital, if not the most important, role in maximizing energy efficiency and preventing the wasteful, inefficient, and unnecessary use of energy throughout the State.

Pursuant to the California Building Standards Code and the Title 24 Energy Efficiency Standards, the City will review the design and construction components of the project's Title 24 compliance when specific building plans are submitted.

6.4.2 - Energy Requirements of the Proposed Project

Short-term construction and long-term operational energy consumption are discussed below.

Short-Term Construction

Development of the project would include short-term construction activities that would consume energy, primarily in the form of diesel fuel (e.g., mobile construction equipment) and electricity (e.g.,

power tools). Construction activities would be subject to applicable regulations such as anti-idling measures, limits on duration of activities, and the use of alternative fuels, thereby reducing energy consumption.

There are no aspects of the project that would foreseeably result in the inefficient, wasteful, or unnecessary consumption of energy during construction activities. For example, there are no unusual characteristics that would directly or indirectly cause construction activities to be any less efficient than would otherwise occur elsewhere (restrictions on equipment, labor, types of activities, etc.).

In summary, the project would not result in the inefficient, wasteful, or unnecessary consumption of energy during construction activities.

Long-Term Operations

Transportation Energy Demand

Vehicle fuel efficiency is regulated at the federal level. Pursuant to the Federal Energy Policy and Conservation Act of 1975, the National Highway Traffic Safety Administration (NHTSA) is responsible for establishing additional vehicle standards and for revising existing standards. As of December 2014, NHTSA indicated that the fuel economy of passenger vehicles averaged 34.2 miles per gallon and light trucks averaged 26.2 miles per gallon.

The proposed project would generate vehicle trips that would consume energy in the form of transportation fuel (gasoline and diesel). Vehicle fuel efficiency standards are set at the federal level and vehicles serving the proposed project would be subject to these standards. The proposed project would implement a Transportation Demand Management (TDM) program to reduce peak hour trips.

Finally, the proposed project is anticipated to result in a net reduction daily vehicle miles traveled by project users (employees, patients, visitors, etc.). The project would provide commercial opportunities for the surrounding residents and project residents who otherwise would drive further distances, as well as pass-by trips that would otherwise drive to other locations further away for commercial services. Transportation fuel consumption would also be expected to experience a net decrease because these longer trips would be replaced by shorter trips.

The project is located directly adjacent to a suburban area and would accommodate bicycle and pedestrian access to adjacent areas. In summary, the project would not result in the inefficient, wasteful, or unnecessary consumption of transportation energy during operational activities**.**

Building Energy Demand

As discussed in Section 3.10, Utilities and Service Systems, the project would demand an estimated 10.5 million kilowatt-hours of electricity and 43.5 million cubic feet of natural gas on an annual basis. All new residential development would be subject to the latest adopted edition of the Title 24 energy efficiency standards, which are among the most stringent in the United States. Conformance to Title 24, along with the mitigation measures identified for the 2030 Merced General Plan, ensures that the project is as energy-efficient as possible, and, therefore, the project would not result in the unnecessary, wasteful, or inefficient use of building energy during operational activities.

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 7: EFFECTS FOUND NOT TO BE SIGNIFICANT

7.1 - Introduction

This section is based on the Notice of Preparation (NOP), dated October 13, 2015, and contained in Appendix A of this Environmental Impact Report (EIR). The NOP was prepared to identify the potentially significant effects of the proposed project and was circulated for public review between October 13 and November 20, 2015. In the course of this evaluation, certain impacts were found to be less than significant because the proposed project's characteristics would not create such impacts. This section provides a brief description of effects found not to be significant or less than significant, based on the NOP comments or more detailed analysis conducted as part of the EIR preparation process. Note that a number of impacts that are found to be less than significant are addressed in the various EIR topical sections (Sections 3.1 through 3.11) to provide more comprehensive discussion of why impacts are less than significant, in order to better inform decision makers and the general public.

7.2 - Effects Found not to be Significant

7.2.1 - Agricultural and Forest Resources

Forest Zoning

The project site does not contain forest land and is zoned "R-3-2, Medium Density Residential" and "C-C, Central Commercial District," which are non-forest zoning designations, by the Merced Zoning Code. This condition precludes the possibility of the proposed project conflicting with forest zoning. No impact would occur.

7.2.2 - Geology, Soils, and Seismicity

The project site contains flat relief and no known earthquake faults exist in the project vicinity. These conditions make it unlikely that the proposed project would be exposed to significant hazards during a seismic event. Furthermore, the proposed project's construction activities would involve grading and soil engineering activities intended to abate any adverse soil conditions that may exist, and would ensure that project buildings have adequate structural support. No impacts would occur.

7.2.3 - Hazards and Hazardous Materials

Exposure of Schools to Hazardous Materials or Emissions

Pioneer Elementary School is located across South Coffee Street from the northwest corner of the project site. However, as discussed under Impact HAZ-1, the use of hazardous materials by the project would be considered minimal and consistent with typical residential and commercial uses, and with the exception of fuel for the proposed fuel station, would not require these materials to be stored in large quantities. The storage of fuel for the proposed fuel station would be subject to regulatory oversight to ensure safe transport and storage of fuels. As such, the project would not create a significant hazard to the school, staff or students at Pioneer Elementary School. No impacts would occur.

Risk of Upset

The Merced City Fire Department and Environmental Health Division work with the County to prevent the uncontrolled release of toxic substances into the environment by conducting inspections of toxic materials facilities, enforcing storage and use requirements, and educating local businesses on proper storage and handling of hazardous materials. The Merced City Fire Department responds to uncontrolled releases within the city limits, identifies the category of chemicals involved, contains the spill if possible, oversees cleanup activities, and makes sure that the site is safe to be occupied again.

The City's Emergency Plan and the County Hazardous Waste Management Plan both deal with detailed emergency response procedures under various conditions for hazardous materials spills. The City also works with the State Department of Health Services to establish cleanup plans and to monitor the cleanup of known hazardous waste sites within the City.

Transport of motor fuels to the proposed fuel station and the storage thereof would be subject to federal, state, and local safety environmental health and safety regulations intended to prevent accidental releases of hazardous materials; refer to Impact HAZ-1 for further discussion of these regulations.

Since no other hazardous materials will be stored in large quantities during construction or operation of the project, no impacts are expected regarding potential upset and accidental conditions involving the release of hazardous materials into the environment. Transportation, storage, use, and disposal of any hazardous materials during construction or operational activities would be required to comply with applicable federal, state, and local statutes and regulations. Compliance with these requirements would ensure that human health and the environment are not exposed to hazardous materials.

Hazardous Materials Site

The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. As such, no impacts would occur that would create a significant hazard to the public of the environment.

Emergency Evacuation or Response

The project site is located approximately 3.5 miles from the Merced Regional Airport and is not located within any of the five airport land use compatibility zones. The airport is a general utility airport located at an elevation of 150 feet with a 1.2-mile-long runway stretching from the northwest to southeast. Land use controls for this area are provided by the City of Merced General Plan and Zoning Ordinance, and the Merced County General Plan and Zoning Ordinance, Part 77.21. The City of Merced has also prepared an airport master plan for the Merced Municipal Airport. The project is located outside the height and safety restriction zones imposed by these plans and, therefore, does not have the potential to result in a safety hazard associated with proximity to an airport. No impacts would occur.

Public and Private Airstrips

The project site is located approximately 3.5 miles from the Merced Regional Airport, and is not located within any of the five airport land use compatibility zones. The airport is a general utility airport located at an elevation of 150 feet with a 1.2-mile-long runway stretching from the northwest to southeast. Land use controls for this area are provided by the City of Merced General Plan and Zoning Ordinance, and the Merced County General Plan and Zoning Ordinance, Part 77.21. The City of Merced has also prepared an airport master plan for the Merced Municipal Airport. The project is located outside the height and safety restriction zones imposed by these plans and therefore does not have the potential to result in a safety hazard associated with its proximity to a private airstrip. No impacts would occur.

7.2.4 - Mineral Resources

The project site contains undeveloped land and does not support mineral extraction operations**.** Neither the State nor the City of Merced designates the project site as a location of known mineral deposits**.** These conditions preclude the possibility of a loss of mineral resources of statewide or local importance**.** No impacts would occur.

7.2.5 - Noise

Aviation Noise Levels

The Merced Regional Airport is located approximately 4 miles west of the project site; the Castle Airport is located approximately 9 miles northwest of the project site. The project site is located well outside of the 55 dBA CNEL noise contours of both of these airports. While occasional noise from aircraft overflights is audible in the project vicinity, implementation of the project would not expose people residing or working in the project area to excessive aviation noise levels. Therefore, noise impacts from aviation activities would be less than significant.

Additionally, no private airstrips are located within 2 miles of the project site. Therefore, no noise impacts would occur from private airstrips.

7.2.6 - Population and Housing

The project site is currently located within the Merced City limits and is contemplated to support future residential and commercial development by the City of Merced Vision 2030 General Plan. The proposed project would reduce the residential development potential by 12 acres and increase the commercial development potential by 12 acres. However, the applicant is proposing a 178-unit, high-density residential development on the residential portion of the project, which would maintain the anticipated unit count assumed by the General Plan for the project site. Thus, there would be no change in the population growth potential from what is currently contemplated by the General Plan. Additionally, the project site does not contain any existing dwelling units, which precludes the possibility of displacement of existing residents. No impacts would occur.

7.2.7 - Recreation

The proposed project does not propose any physical changes to existing recreational facilities and does not propose the construction of new or expanded recreational facilities. These conditions preclude the possibility of physical impacts to the environment from such activities. No impacts would occur.

7.2.8 - Public Services

Schools

The project will add population to the city and will generate students for the Merced School System. The City's General Plan EIR determined that growth of schools attributable to population growth anticipated in the General Plan would be accommodated through the development fees allocated to the school district from new development. The proposed project will generate fewer students than would otherwise occur under the General Plan buildout for this area. No impacts would occur.

Libraries and Other Services

The City's General Plan EIR determined that buildout from projects identified in the General Plan would increase population but would not have an impact to the provision of libraries under CEQA. The proposed project will generate the same or fewer residents than would otherwise occur under the General Plan buildout for this area. No impacts would occur.

SECTION 8: PERSONS AND ORGANIZATIONS CONSULTED/LIST OF PREPARERS

8.1 - Persons and Organizations Consulted

8.1.1 - Lead Agency

City of Merced

Development Services

Principal Planner..... Bill King

Police Department

Lieutenant.....Lance Eber

8.1.2 - Public Agencies

Local Agencies

City of Merced Waste Water Treatment Plant

Account Clerk..... Sarah Knoester

Highway 59 Landfill

Resource Manager.....Jerry Lawrie

8.2 - List of Preparers

8.2.1 - Lead Agency

City of Merced

Principal Planner..... Bill King

8.2.2 - Lead Consultant

FirstCarbon Solutions

Project Director .....Jason Brandman
Project Manager ..... Elizabeth Johnson
Noise Analyst .....Phil Ault
Air Quality Analyst ..... Dave Mitchell
Greg Tonkovich
Project Archaeologist .....Dana DePietro
Project Biologist..... Kristiaan Stuart
Technical Editor ..... Ed Livingston
Word Processor .....Ericka Rodriguez
Graphics/GIS ..... John De Martino
Reprographics..... Kevin Salguero

8.2.3 - Technical Subconsultants

KD Anderson and Associates, Transportation Engineers

Ken Anderson ..... Principal

Balance Hydrologics

Senior Hydrologist. ..... Scott Brown, P.G.
Principal Geologist ..... David Shaw, P.G.

SECTION 9: REFERENCES

Air Now. 2015. AQI Calculator: AQI to Concentration. Website: http://www.airnow.gov /index.cfm?action=resources.aqi_conc_calc. Accessed September 28, 2015.

Ascent Environmental. Draft Environmental Impact Report for the Highway 59 Landfill Valley Fill Project. September 2015. Website: http://www.mcagov.org/DocumentCenter /Home/View/290. Accessed February 22, 2016.

Beardsley, R.K. 1948. Cultural Sequences in Central California Archaeology. American Antiquity 14:1-28.

Beardsley, R.K. 1954. Temporal and Areal Relationships in Central California Archaeology. University of California Archaeological Survey Reports 24:1-62; 25:63-131.

Beck, W.A. and Y.D. Hasse. 1974. Historical Atlas of California. Norman: University of Oklahoma Press.

Bennyhoff, J. 1950. Californian Fish Spears and Harpoons. University of California Anthropological Records 9(4):295

CalAdapt. 2015. Local Climate Snapshots. Website: http://cal-adapt.org/tools/factsheet/. Accessed December 21, 2015.

CalEEMod. California Emissions Estimator Model. Version 2013.2.2 Website: http://caleemod.com/. Accessed December 21, 2015.

California Air Pollution Control Officers Association (CAPCOA). 2009. Health Risk Assessments for Proposed Land Use Projects. Website: http://www.capcoa.org/wp-content /uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf. Accessed March 9, 2015.

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures. August 2010. Website: http://www.capcoa.org/wp-content /uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed March 11, 2015.

California Air Pollution Control Officers Association (CAPCOA). 2015. CAPCOA Greenhouse Gas Reduction Exchange. Website: http://www.ghgrx.org/. Accessed September 15, 2015.

California Air Resources Board (ARB). 1998. The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines. Website: http://www.arb.ca.gov/toxics/dieseltac/factsht1.pdf. Accessed March 13, 2015.

California Air Resources Board (ARB). 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles. Website: http://www.arb.ca.gov /diesel/documents/rrpfinal.pdf. Accessed March 13, 2015.

California Air Resources Board (ARB). 2005. California Environmental Protection Agency. Air Quality and Land Use Handbook: A Community Health Perspective. April 2005. Website: www.arb.ca.gov/ch/landuse.htm. Accessed December 15, 2015.

California Air Resources Board (ARB). 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. Website: www.arb.ca.gov/cc/inventory /pubs/reports/staff_report_1990_level.pdf. Accessed August 17, 2015.

California Air Resources Board (ARB). 2008. (includes edits made in 2009) Climate Change Scoping Plan, a framework for change. Website: www.arb.ca.gov/cc/scopingplan/document /scopingplandocument.htm. Accessed August 17, 2015.

California Air Resources Board (ARB). 2009a. California Air Resources Board. Vinyl Chloride. Website: www.arb.ca.gov/research/aaqs/caaqs/vc/vc.htm. Accessed March 13, 2015.

California Air Resources Board (ARB). 2009b. The California Almanac of Emissions and Air Quality - 2009 Edition. Chapter 4, Air Basin Trends and Forecasts - Criteria Pollutants. Website: www.arb.ca.gov/aqd/almanac/almanac09/chap409.htm. Accessed March 13, 2015.

California Air Resources Board (ARB). 2010. Pavley 1 + Low Carbon Fuel Standard Postprocessor Version 1.0 User's Guide. Website: Website: www.arb.ca.gov/aqd/almanac/almanac09/chap409.htm. Accessed March 13 and November 13, 2015.

California Air Resources Board (ARB). 2011a. California Greenhouse Gas Emissions Inventory 2000-2009. Website: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-09_report.pdf. Accessed March 13, 2015.

California Air Resources Board (ARB). 2011b. Regulation for Reducing Emissions from Consumer Products. Website: www.arb.ca.gov/consprod/regs/fro%20consumer%20products%20regulation.pdf. Accessed March 13, 2015.

California Air Resources Board (ARB). 2011c. Status of Scoping Plan Recommended Measures. Website: www.arb.ca.gov/cc/scopingplan/sp_measures_implementation_timeline.pdf. Accessed August 18, 2015.

California Air Resources Board (ARB). 2013a. Area Designation Maps/State and National. 2012 State Area Designations. Changes became effective April 1, 2013. Website: www.arb.ca.gov/desig/adm/adm.htm. Accessed December 21, 2015.

California Air Resources Board (ARB). 2013b. California Air Resources Board. Ambient Air Quality Standards. Updated March 9, 2015. Website: www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed August 18, 2015.

California Air Resources Board (ARB). 2013c. Clean Car Standards—Pavley, Assembly Bill 1493. Website: http://www.arb.ca.gov/cc/ccms/ccms.htm. Accessed: October 13, 2015.

California Air Resources Board (ARB). 2013d. Facts About the Clean Cars Program. Website: http://www.arb.ca.gov/msprog/zevprog/factsheets/advanced_clean_cars_eng.pdf. Accessed August 17, 2015.

California Air Resources Board (ARB). 2014a. First Update to the Climate Change Scoping Plan. Website: http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed August 21, 2015.

California Air Resources Board (ARB). 2014b. California Greenhouse Gas Emissions for 2000 to 2012 –Trends of Emissions and Other Indicators. Website: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf. Accessed August 21, 2015.

California Air Resources Board (ARB). 2015a. Reducing Short-Lived Climate Pollutants in California. Website: http://www.arb.ca.gov/cc/shortlived/shortlived.htm. Accessed September 9, 2015.

California Air Resources Board (ARB). 2015b. Short-Lived Climate Pollutant Reduction Strategy, Concept Paper. May. Website: http://www.arb.ca.gov/cc/shortlived/concept_paper.pdf. Accessed September 9, 2015.

California Air Resources Board (ARB). 2015c. ARB Emissions Trading Program. Website: http://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf. Accessed September 15, 2015.

California Air Resources Board (ARB). 2015d. Low Carbon Fuel Standard Regulation. Website: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm. Accessed July 28, 2015.

California Air Resources Board (ARB). 2015e. Historical Air Quality, Top 4 Summary. Website: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed December 21, 2015.

California Archives. 2006. History of Merced County. Website: http://www.rootsweb.com /~usgenweb/ca/merced/history.html.

California Building Standards Commission (CBSC) 2013. California Building Standards Code, California Code of Regulations Title 24, Part 11. Website: http://www.ecodes.biz/ecodes_support/free_resources/2013California/13Green/PDFs/2013%20California%20Green%20Building%20Standards%20Code%20Title%20page.pdf. Accessed August 17, 2015.

California Climate Change Center. (CCCC). 2006. Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center. July 2006. CEC-500-2006-077. Website: www.scc.ca.gov/webmaster/ftp/pdf/climate_change /assessing_risks.pdf. Accessed August 17, 2015.

California Department of Conservation, Division of Land Resource Protection. 2013. Merced County Williamson Act Fiscal Year 2013/2014: Sheet 1 of 2. Website: ftp://ftp.consrv.ca.gov/pub /dlrp/wa/Merced_n_13_14_WA.pdf. Accessed November 25, 2015.

California Department of Conservation. 2014. Merced County Important Farmland 2014: Sheet 1 of 2. Website: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2014/mer14_no.pdf. Accessed November 30, 2015.

California Department of Conservation. 2015. Merced County Land Use Conversion. Website: http://www.conservation.ca.gov/dlrp/fmmp/Pages/Merced.aspx. Accessed November 30, 2015.

California Department of Resources Recycling and Recovery (CalRecycle). 2015. Countywide, Regionwide, and Statewide Jurisdiction Diversion/Disposal Progress Report). Website http://www.calrecycle.ca.gov/lgcentral/Reports/jurisdiction/diversiondisposal.aspx. Accessed December 21, 2015.

California Department of Transportation. 2016. "Officially Designated State Scenic Highways." Website: http://www.dot.ca.gov/hq/LandArch/scenic_highways/. Accessed January 20, 2016.

California Department of Water Resources. 2003. Bulletin 118: San Joaquin Valley Groundwater Basin Merced Subbasin. Website: http://www.water.ca.gov/groundwater /bulletin118/basindescriptions/5-22.04.pdf

California Department of Water Resources. 2013. California Water Plan Update 2013, Chapter 3 Urban Water Use Efficiency. Website: http://www.water.ca.gov/calendar/materials/vol3_urbanwue_apr_release_16033.pdf. Accessed September 25, 2015.

California Energy Commission. (CEC). 2013. Building Energy Efficiency Standards. Website: http://www.energy.ca.gov/2012publications/CEC-400-2012-004/CEC-400-2012-004-CMF-REV2.pdf. Accessed November 16, 2015.

California Energy Commission. (CEC). 2014. Integrated Energy Policy Report: 204 IEPR Update. Website: http://www.energy.ca.gov/2014publications/CEC-100-2014-001/CEC-100-2014-001-CMF-small.pdf. Accessed September 28, 2015.

California Environmental Protection Agency. 2002. Office of Environmental Health Hazard Assessment. Health Effects of Diesel Exhaust. Website: www.oehha.ca.gov/public_info /facts/pdf/diesel4-02.pdf. Accessed March 9, 2015.

California Natural Resources Agency. 2009. 2009 California Climate Adaptation Strategy. Website: http://www.climatechange.ca.gov/adaptation/strategy/index.html. Accessed August 17, 2015.

California Public Utilities Commission. (CPUC). 2011. Renewable Portfolio Standard Quarterly Report. Website: http://www.cpuc.ca.gov/NR/rdonlyres/2A2D457A-CD21-46B3-A2D7-757A36CA20B3/0/Q3RPSReporttotheLegislatureFINAL.pdf. Accessed September 17, 2015.

CalRecycle. Facility/Site Summary Details. Website: http://www.calrecycle.ca.gov /SWFacilities/Directory/24-AA-0001/Detail/. Accessed February 22, 2016.

Center for Climate and Energy Solutions (C2ES). 2015. Multi-State Climate Initiatives. Website: http://www.c2es.org/us-states-regions/regional-climate-initiatives. Accessed November 30, 2015.

Centers for Disease Control and Prevention (CDC). 2010. Department of Health and Human Services, the National Institute for Occupational Safety and Health. Carbon Dioxide. Website: www.cdc.gov/niosh/npg/npgd0103.html. Accessed August 17, 2015.

Centers for Disease Control and Prevention (CDC). 2012. Construction - Website: www.cdc.gov/niosh/construction/. Indoor Environmental Quality - Website: www.cdc.gov/niosh/topics/indoorenv/constructionieq.html. Accessed March 9, 2015.

Chartkoff, J.L. and K.K. Chartkoff. 1984. The Archaeology of California. Stanford University Press, Menlo Park.

City of Merced General Plan. 2012. Website: https://www.cityofmerced.org/civicax /filebank/blobdload.aspx?BlobID=11478. Accessed 18 January 2016.

City of Merced Website. 2016. Website: https://www.cityofmerced.org/depts/pw /wastewater_system/wwtp/default.asp. Accessed February 1, 2016.

City of Merced, CA. 2006. History. Website: http://www.cityofmerced.org/about/history.asp.

City of Merced. 2002. City of Merced Storm Drainage Master Plan.

City of Merced. 2012. Climate Action Plan. Website: https://www.cityofmerced.org/depts/cd/ planning/climate_action_plan/. Accessed December 21, 2015.

City of Merced. 2012. Merced Vision 2030 General Plan.

City of Merced. 2012. Merced Vision 2030 General Plan. Website: https://www.cityofmerced.org/

City of Merced. 2012. Merced Vision 2030 General Plan. Website: https://www.cityofmerced.org /depts/cd/planning/merced_vision_2030_general_plan.asp. Accessed November 30, 2015.

City of Merced. 2012. Merced Vision 2030 General Plan. January 3.

Department of Water Resources, the Resources Agency, State of California. October 2008. Managing an Uncertain Future, Climate Change Adaptation Strategies for California's Water. www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf. Accessed March 13, 2015.

Dickel, D.N., P. D. Schulz, and H.M. McHenry. 1984. Central California: Prehistoric Subsistence Changes and Health. In Paleopathology at the Origins of Agriculture, edited by Mark Nathan Cohen and George J. Armelagos, pp. 439-462. Academic Press, Inc., Orlando, FL.

Federal Highway Administration (FHWA). 2006. Highway Construction Noise Handbook. August.

Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment. May.

Fredrickson, D.A. 1973. "Early Cultures of the North Coast of the North Coast Ranges, California." (PhD dissertation, University of California, Davis, 1973).

Gerow, B.A. 1954. "The Problem of Cultural Sequences in Central California Archaeology." Paper presented at the Annual Meeting of the American Association for the Advancement of Sciences.

Gerow, B.A. 1974. Comments on Fredrickson's "Cultural Diversity." The Journal of California Anthropology 1(2):239-246.

Gerow, B.A., with R. Force. 1968. An Analysis of the University Village Complex with a Reappraisal of Central California Archaeology. Stanford University Press, Stanford., CA.

Governor's Office of Planning and Research. 2008. Technical Advisory. CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review. Website: http://opr.ca.gov/docs/june08-ceqa.pdf. Accessed March 13, 2015.

Highway 59 Landfill. 2016. Spoke with Jerry Lawrie on February 22, 2016.

Hughes, R.E. (editor). 1994. Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson. Assembled and edited by Richard E. Hughes. Contributions of the University of California No. 52, Archaeological Research Facility, Berkeley, CA.

Intergovernmental Panel on Climate Change (IPCC). 2001. Climate Change 2001: The Scientific Basis. Website: http://www.grida.no/climate/ipcc_tar/wg1/pdf/WG1_TAR-FRONT.pdf. Accessed August 15, 2015.

Intergovernmental Panel on Climate Change (IPCC). 2007a. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller [eds.]). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, Website: www.ipcc.ch /publications_and_data/ar4/wg1/en/contents.html. Accessed August 18, 2015.

Intergovernmental Panel on Climate Change (IPCC). 2007b. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Core Writing Team, Pachauri, R.K. and Reisinger, A. [eds.]). IPCC, Geneva, Switzerland. Website: www.ipcc.ch/publications_and_data/ar4/syr /en/contents.html. Accessed March 13, 2015.

Intergovernmental Panel on Climate Change (IPCC). 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Johnson, J.J. 1976. Archaeological Investigations at the Blodgett Site (CA-SAC-267), Sloughhouse Locality, California. Report to the U.S. National Parks Service, Western Regional Office, Tucson, AZ.

Kroeber, A.L. 1925. Handbook of the Indians of California. Bureau of American Ethnology Bulletin #78.

Lillard, J.B. and W.K. Purves. 1936. The Archaeology of the Deer Creek-Cosumnes Area, Sacramento County, California. Sacramento, Sacramento Junior College, Department of Anthropology Bulletin 1.

Lillard, J.B., R.F. Heizer, and F. Fenenga. 1939. An Introduction to the Archaeology of Central California. Sacramento Junior College, Department of Anthropology, Bulletin 2.

Merced Chamber of Commerce. 2006. History of Merced County. Website: http://www.merced-chamber.com/history.html. Accessed.

Merced Climate Action Plan. 2012. Website: https://www.cityofmerced.org/civicax/filebank /blobdload.aspx?BlobID=11898. Accessed February 1, 2016.

Merced County Courthouse Museum. 2006. Past Exhibits. Website: http://www.mercedmuseum.org. Accessed.

Merced County Department of Agriculture. 2014. Annual Report on Agriculture 2014. Website: http://www.co.merced.ca.us/ArchiveCenter/ViewFile/Item/506. Accessed November 30, 2015.

Merced County. 2013. 2030 Merced County General Plan. December. Website: http://www.co.merced.ca.us/DocumentCenter/Home/View/6766. Accessed November 30, 2015.

Merced Fire Department. 2015. Annual Report 2014. Website: https://www.cityofmerced.org /civicax/filebank/blobdload.aspx?BlobID=14827. Accessed January 18, 2016.

Merced Gateway Application. 2015.

Merced Irrigation District. 2015. Maps. Website: http://www.mercedid.com/index.cfm /water/maps/. Accessed November 30, 2015.

Merced Municipal Code. 2015. Website: https://www.municode.com/library/ca/merced /codes/code_of_ordinances. Accessed January 27, 2016.

Merced Police Department. 2016. Contacted Lance Eber in Statistics Department on February 2, 2016.

Merced Waste Water Treatment Plant. 2016. Contacted Sarah Knoster on February 22, 2016.

Merced Wastewater Treatment Plant EIR. 2006. Website: https://www.cityofmerced.org/depts. /engineering_division/waste_water_treatment_plant_expansion_deir/default.asp. Accessed February 16, 2016.

Monterey County Historical Society. 2006 Cattle Boom of 1849-1862. Website: http://www.mchsmuseum.com/websiteindex.html. Accessed.

Moratto, M.J. 1984. California Archaeology. San Diego, Academic Press.

Moser et al. 2009. Moser, Susie, Guido Franco, Sarah Pittiglio, Wendy Chou, Dan Cayan. 2009. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2008-071. Website: www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF. Accessed March 9, 2015.

National Aeronautics and Space Administration (NASA). 2015. Global Climate Change: Vital Signs of the Planet. Website: http://climate.nasa.gov/causes/. Accessed October 9, 2015.

National Toxicology Program. 2011a. Report on Carcinogens, Twelfth Edition; U.S. Department of Health and Human Services, Public Health Service. June 10, 2011. Benzene. Website: http://ntp.niehs.nih.gov/ntp/roc/twelfth/profiles/Benzene.pdf. Accessed March 9, 2015.

National Toxicology Program. 2011b. Report on Carcinogens, Twelfth Edition; U.S. Department of Health and Human Services, Public Health Service. Diesel Exhaust Particles. Website: http://ntp.niehs.nih.gov/ntp/roc/twelfth/profiles/DieselExhaustParticulates.pdf. Accessed March 13, 2015.

Nationwide Environmental Title Research, LLC. 2015. Historical Aerials dated 1946, 1958, 1998, 2005, 2010, and 2012. Website: http://historicaerials.com/. Accessed November 30, 2015.

Occupational Safety and Health Administration (OSHA). 2003. United States Department of Labor. Safety and Health Topics: Methane. Website: www.osha.gov/dts/chemicalsampling/data/CH_250700.html. Accessed March 9, 2015.

Office of Environmental Health Hazard Assessment (OEHHA 2003). Air Toxics Hot Spots Program Risk Assessment Guidelines, The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Website: http://oehha.ca.gov/air/hot_spots/pdf/HRAguidefinal.pdf. Accessed March 16, 2015.

Ragir, S.R. 1972. The Early Horizon in Central California Prehistory. Contributions of the University of California Archaeological Research Facility 15. Berkeley, CA.

Ryan, Mary Ellen and Gary S. Breschini. No Date. The California Cattle Boom 1849-1862. Electronic document reprinted on the website of the Monterey County Historical Society www.mchsmuseum.com.

San Joaquin Valley Air Pollution Control District 2006. Guidance for Air Dispersion Modeling. Website: http://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf.

San Joaquin Valley Air Pollution Control District 2007. Guidance for Air Dispersion Modeling. Website: https://www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance%20W_O%20Pic.pdf. Accessed August 24, 2015.

San Joaquin Valley Air Pollution Control District 2012b. What is a Health Risk Assessment. Website: http://www.valleyair.org/brochures/docs/hra%20brochure.pdf. Accessed March 16, 2015.

San Joaquin Valley Air Pollution Control District. 2007. 2007 Ozone Plan. Website: www.valleyair.org /Air_Quality_Plans/AQ_Final_Adopted_Ozone2007.htm. Accessed March 16, 2015.

San Joaquin Valley Air Pollution Control District. 2008. Climate Action Plan. Website: http://www.valleyair.org/programs/CCAP/CCAP_menu.htm. Accessed March 9, 2015.

San Joaquin Valley Air Pollution Control District. 2009a. Guidance for Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. Website: www.valleyair.org/programs /CCAP/11-05-09/3_CCAP_FINAL_LU_Guidance_Nov_05_2009.pdf. Accessed March 11, 2015.

San Joaquin Valley Air Pollution Control District. 2009b. "Final Staff Report, Addressing Greenhouse Gas Emissions Impacts under the California Environmental Quality Act." December 2009. Accessed March 11, 2015

San Joaquin Valley Air Pollution Control District. 2012a. 2012 PM2.5 Plan. Website: http://www.valleyair.org/Air_Quality_Plans/PM25Plan2012/CompletedPlanbookmarked.pdf. Accessed September 28, 2015.

San Joaquin Valley Air Pollution Control District. 2015. 2015 Plan for the 1997 PM2.5 Standard. Website: http://www.valleyair.org/Air_Quality_Plans/PM25Plans2015.htm. Accessed August 26, 2015.

San Joaquin Valley Air Pollution Control District. 2015. Final Draft Guidance for Assessing and Mitigating Air Quality Impacts. February 19. Website: http://www.valleyair.org /transportation/GAMAQI-2015/FINAL-DRAFT-GAMAQI.PDF. Accessed August 18, 2015.

Schenck, W.E., and E. J. Dawson. 1929. "Archaeology of the Northern San Joaquin Valley." American Archaeology and Ethnology 25:286-413.

State Water Resources Control Board. 2012. "Impaired Water Bodies." Website: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2012.shtml. Accessed February 11, 2016.

Storm Water Management Plan. 2007. Website: http://www.waterboards.ca.gov/water_issues /programs/stormwater/swmp/merced_swmp.pdf. Accessed on February 18, 2016.

U. S. Geological Survey. 2000. Operational Guidelines (version 1.0) for Geological Fieldwork in Areas Endemic for Coccidioidomycosis (Valley Fever). Website: http://gec.cr.usgs.gov/projects /sw/pubs/task4/Fisher_et_al_2000.pdf. Accessed August 24, 2015.

United Nations Framework Convention on Climate Change. 2010. National Greenhouse Gas Inventory Data for the Period 1990-2008. Website: http://unfccc.int/resource/docs/2010/sbi/eng/18.pdf. Accessed March 16, 2015.

United States Department of Agriculture (USDA). 2015. Web Soil Survey. Website: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed November 25, 2015.

United States Environmental Protection Agency (EPA). 1974. "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." March.

United States Environmental Protection Agency (EPA). 2003. Particle Pollution and your Health. EPA-452/F-03-001. Website: http://epa.gov/pm/pdfs/pm-color.pdf. Accessed March 16, 2015.

United States Environmental Protection Agency (EPA). 2009a. Ozone and your Health. EPA-456/F-09-001. Website: http://www.epa.gov/airnow/ozone-c.pdf. Accessed March 9, 2015.

United States Environmental Protection Agency (EPA). 2009b. Fact Sheet, Proposed Revisions to the National Ambient Air Quality Standards for Nitrogen Dioxide. July 22, 2009. Website: http://www.epa.gov/oaqps001/nitrogenoxides/pdfs/20090722fs.pdf. Accessed March 11, 2015.

United States Environmental Protection Agency (EPA). 2009c. Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act. Website: http://www.epa.gov/climatechange/endangerment/. Accessed August 17, 2015.

United States Environmental Protection Agency (EPA). 2010a. Technology Transfer Network, Air Toxics Website. Page updated April 5, 2010. Health Effects Notebook for Hazardous Air Pollutants. Website: www.epa.gov/ttn/atw/hlthef/hapindex.html. Accessed March 16, 2015.

United States Environmental Protection Agency (EPA). 2010b. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule. Website: http://www.epa.gov/nsr/documents/20100413final.pdf. Accessed August 17, 2015.

United States Environmental Protection Agency (EPA). 2011a. Indoor Air Quality. Sources of Indoor Air Pollution - Organic Gases (Volatile Organic Compounds - VOCs). Website: www.epa.gov/iaq/voc.html. Accessed March 9, 2015.

United States Environmental Protection Agency (EPA). 2011b. 2011 U.S. Greenhouse Gas Inventory Report. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009. EPA 430-R-11-005. Website: www.epa.gov/climatechange/ghgemissions/usinventoryreport/archive.html. Accessed March 13, 2015.

United States Environmental Protection Agency (EPA). 2012a. Green Book Nonattainment Areas for Criteria Pollutants as of December 14, 2012. Website: www.epa.gov/air/oaqps/greenbk/. Accessed March 13, 2015.

United States Environmental Protection Agency (EPA). 2012b. EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks. Website: http://www.epa.gov/otaq/climate/documents/420f12051.pdf. Accessed March 16, 2015.

United States Environmental Protection Agency (EPA). 2013. Federal Register. National Ambient Air Quality Standards for Particulate Matter. Website: http://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf. Accessed March 11, 2015.

United States Environmental Protection Agency. 1998. Characterization of Building Related Construction and Demolition Debris in the United States. February.

United States Geological Survey. 2011. Van Gosen, B.S., and Clinkenbeard, J.P. California Geological Survey Map Sheet 59. Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California. Open-File Report 2011-1188 Website: http://pubs.usgs.gov/of/2011/1188/. Accessed December 21, 2015.

Urban Water Management Plan. 2010. Website: https://www.cityofmerced.org/civicax/filebank/blobdload.aspx?BlobID=10343. Accessed February 1, 2016.

Wallace, W.J. 1955. A Suggested Chronology for Southern California Coastal Archaeology. Albuquerque: Southwestern Journal of Anthropology 11:214-230.

Wallace, W.J. 1978. Northern Valley Yokuts. In R.F. Heizer, (ed.), Handbook of North American Indians, Vol. 8: California. Washington, D.C.: Smithsonian Institute.

Warren, C.N. 1968. Cultural Tradition and Ecological Adaptation on the Southern California Coast. Archaic Prehistory in the Western United States, C. Irwin-Williams, ed. Eastern New Mexico University Contributions in Anthropology vol. 1, no. 3, pp. 1-4. Portales.

Water Consumer Confidence Report. 2014. Website: https://www.cityofmerced.org/civicax/filebank/blobdload.aspx?BlobID=10293. Accessed February 1, 2016.

Western Regional Climate Center. 2012. Website: http://www.wrcc.dri.edu/. Accessed March 13, 2015.

Western Regional Climate Center. 2016. Website: http://www.wrcc.dri.edu/. Accessed February 10, 2016.

Wikipedia. 2006. Castle Air Force Base. Website: http://en.wikipedia.org/wiki/Castle_Air_Force_Base.

Yosemite Valley Railroad. 2006. Merced Railroads. Website: http://yosemitevalley railroads.com/MERCED.RAILROADS/MercerRR.html.

THIS PAGE INTENTIONALLY LEFT BLANK