

3.7 Greenhouse Gas Emissions

3.7.1 Introduction

This section evaluates the potential effects on greenhouse gas (GHG) emissions associated with development and operation of the Yosemite Avenue-Gardner Avenue to Hatch Road Annexation Project (proposed project). This section describes the existing GHG emissions conditions in the project region; outlines applicable federal, state, and regional regulations pertaining to GHG emissions; and identifies potential project-specific and cumulative impacts on air quality and measures to minimize these impacts.

As discussed in Chapter 1, Introduction, a Notice of Preparation (NOP) for this Environmental Impact Report (EIR) was initially published in December 2016 based on the original project applications. In 2019, the project applicant submitted revised applications and site plans, increasing the number of residential units from 330 to 540 and increasing the amount of onsite parking. The City issued a revised NOP in May 2020. No comments were received in response to either NOP that raised concerns regarding GHG emissions. Both NOPs and all comments received in response to them are provided in Appendix A.

Resources referenced to prepare this section include the Merced Vision 2030 General Plan (City of Merced 2012), the Merced County 2030 General Plan (Merced County 2013), and the San Joaquin Valley Air Pollution Control District's (SJVAPCD) Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009). In addition, Dudek completed modeling of the GHG emissions associated with project construction and operation using the Estimator Model (CalEEMod) Version 2016.3.2 (CAPCOA 2017). The CalEEMod modeling is provided in Appendix D.

3.7.2 Environmental Setting

The Greenhouse Effect

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind patterns, lasting for an extended period of time (decades or longer). A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Without it, the temperature of the Earth would be about 0°F (-18°C) instead of its present 57°F (14°C). If the atmospheric concentrations of GHGs rise, the average temperature of

the lower atmosphere will gradually increase. Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect.

Greenhouse Gases

GHGs include, but are not limited to, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), O₃, water vapor, hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted to the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as HFCs, HCFCs, PFCs, and SF₆, which are associated with certain industrial products and processes. A summary of the most common GHGs and their sources is included in the following text. The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report (1995), IPCC Fourth Assessment Report (2007), the California Air Resources Board's (CARB's) Glossary of Terms Used in GHG Inventories (2017a), and the U.S. Environmental Protection Agency's (EPA's) Glossary of Climate Change Terms (2016).

Carbon Dioxide. CO₂ is a naturally occurring gas and a by-product of human activities and is the principal anthropogenic GHG that affects the Earth's radiative balance. Natural sources of CO₂ include respiration of bacteria, plants, animals, and fungus; evaporation from oceans, volcanic out-gassing; and decomposition of dead organic matter. Human activities that generate CO₂ are from the combustion of coal, oil, natural gas, and wood.

Methane. CH₄ is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. Sources of N₂O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and the use of N₂O as a propellant (such as in rockets, racecars, aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are synthetic powerful GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone-depleting substances (e.g., CFCs, HCFCs, and halons). The most prevalent fluorinated gases include the following:

- **Chlorofluorocarbons:** CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere) and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric O₃.
- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals that are used as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Hydrochlorofluorocarbons:** HCFCs are compounds containing hydrogen, fluorine, chlorine, and carbon atoms. HFCs are synthetic chemicals that are used as alternatives to ozone depleting substances (chlorofluorocarbons).
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, along with HFCs, to the ozone depleting substances. The two main sources of PFCs are primarily aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF₆ is a colorless gas that is soluble in alcohol and ether and slightly soluble in water. SF₆ is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF₃ is used in the manufacture of a variety of electronics, including semiconductors and flat panel displays.
- **Black Carbon.** Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is a short-lived species that varies spatially, which makes it difficult to quantify the global warming potential. Diesel particulate matter emissions are a major source of black carbon and

are also TACs that have been regulated and controlled in California for several decades to protect public health.

- **Water Vapor.** The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere. It is essential to maintaining a climate necessary for life.
- **Ozone.** Tropospheric O₃, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric O₃, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O₂), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric O₃, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet-B radiation.
- **Aerosols.** Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative balance of the Earth (e.g., affect cloud formation or albedo) (EPA 2016). The IPCC developed the global warming potential (GWP) concept to compare the relative abilities of each GHG to trap heat in the atmosphere. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO₂; therefore, GWP-weighted emissions are measured in metric tons of CO₂ equivalent (MT CO₂E).

The current version of the California Emissions Estimator Model (CalEEMod) (version 2016.3.2) assumes that the GWP for CH₄ is 25 (so emissions of 1 MT of CH₄ are equivalent to emissions of 25 MT of CO₂), and the GWP for N₂O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the project.

3.7.3 Regulatory Setting

GHG emissions are monitored through the efforts of various international, federal, state, regional, and local government agencies. The agencies work jointly and individually to reduce GHG emissions through legislation, regulations, planning, policy making, education, and a variety of programs. The agencies responsible for regulating contributors to climate change within the City of Merced (City) are discussed in the following text.

Federal Regulations

Massachusetts vs. EPA

On April 2, 2007, in *Massachusetts v. EPA*, the Supreme Court directed the EPA Administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA Administrator is required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009, the EPA Administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- The Administrator found that elevated concentrations of GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the “endangerment finding.”
- The Administrator further found the combined emissions of GHGs—CO₂, CH₄, N₂O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the “cause or contribute finding.”

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act of 2007

On December 19, 2007, President George W. Bush signed the Energy Independence and Security Act of 2007. Among other key measures, the Act would do the following, which would aid in the reduction of national GHG emissions:

1. Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
2. Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and directs National Highway Traffic Safety Administration (NHTSA) to

establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.

3. Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards

In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order (EO) 13432 in 2007 directing the EPA, the Department of Transportation (DOT), and the Department of Energy (DOE) to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011; and, in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Obama issued a memorandum directing the DOT, DOE, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO₂ in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. On January 12, 2017, EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO₂ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans and all types of sizes of buses and work trucks. The final standards are expected to lower carbon dioxide emissions by

approximately 1.1 billion MT and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

Clean Power Plan and New Source Performance Standards for Electric Generating Units

On October 23, 2015, EPA published a final rule (effective December 22, 2015) establishing the Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO₂ emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units, and (2) stationary combustion turbines. Concurrently, EPA published a final rule (effective October 23, 2015) establishing Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units (80 FR 64661–65120). The rule prescribes CO₂ emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. Implementation of the Clean Power Plan has been stayed by the U.S. Supreme Court pending resolution of several lawsuits. In October 2017, the EPA proposed to repeal the Clean Power Plan.

State Regulations

The statewide GHG emissions regulatory framework is summarized in this subsection by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, water, solid waste, and other state actions. The following text describes EOs, Assembly Bills (ABs), Senate Bills (SBs), and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

The state has taken a number of actions to address climate change. As summarized here, these actions include EOs, legislation, and CARB plans and requirements.

California began regulating GHG emissions in June 2005 with EO S-3-05, which set the following targets for reducing GHG emissions :

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80% below 1990 levels

This was followed in 2006 with the Legislature enacting AB 32, the California Global Warming Solutions Act of 2006 (California Health and Safety Code, Sections 38500–38599 et seq). AB 32 provided initial direction on creating a comprehensive multiyear program to limit California’s GHG emissions to 1990 levels by 2020, and initiate the transformations required to achieve the state’s long-range climate objectives.

A critical component of AB 32 was the directive to CARB to develop a Climate Change Scoping Plan. In 2008, CARB approved the first scoping plan: The Climate Change Proposed Scoping Plan: A Framework for Change (Scoping Plan). The Scoping Plan included a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission-reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the state’s long-range climate objectives. The key elements of the Scoping Plan include the following (CARB 2008):

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewable energy mix of 33%
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California’s GHG emissions
- 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 (17 CCR 95480 et seq.)
- Creating targeted fees, including a public goods charge on water use, fees on high-GWP gases, and a fee to fund the administrative costs of the State of California’s long-term commitment to AB 32 implementation

The Scoping Plan also identified local governments as essential partners in achieving California’s goals to reduce GHG emissions because they have broad influence and, in some cases, exclusive authority over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Specifically, the Scoping Plan encouraged local governments to adopt a reduction goal for municipal operations and for community emissions to reduce GHGs by approximately 15% from then levels (2008) by 2020. Many local governments, including the City of Merced, developed community-scale local GHG-reduction plans based on this Scoping Plan

recommendation. The City's Climate Action Plan is discussed in the Local Regulations section below.

In 2014, CARB approved the first update to the Scoping Plan. The First Update to the Climate Change Scoping Plan: Building on the Framework (First Update) defined the state's GHG emission reduction priorities for the next 5 years and laid the groundwork to start the transition to the post-2020 goals set forth in EOs S-3-05 and B-16-2012 (CARB 2014). The First Update concluded that California is on track to meet the 2020 target, but recommended a 2030 mid-term GHG reduction target be established to ensure a continuum of action to reduce emissions. The First Update recommended a mix of technologies in key economic sectors to reduce emissions through 2050 including energy demand reduction through efficiency and activity changes; large-scale electrification of on-road vehicles, buildings and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies. As part of the First Update, CARB recalculated the state's 1990 emissions level, using more recent GWPs identified by the IPCC, from 427 MMT CO₂e to 431 MMT CO₂e.

In 2015, as directed by EO B-30-15, CARB began working on an update to the Scoping Plan to incorporate the 2030 target of 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing GHG emissions to 80% below 1990 levels by 2050, as set forth in S-3-05. The Governor called on California to pursue a new and ambitious set of strategies, in line with the five climate change pillars from his inaugural address, to reduce GHG emissions and prepare for the unavoidable impacts of climate change. In the summer of 2016, the Legislature affirmed the importance of addressing climate change through passage of SB 32.

In December 2017, CARB approved the 2017 Climate Change Scoping Plan Update (Second Update, CARB 2017a). The Second Update builds on the successful framework established in the initial Scoping Plan and First Update, while identifying new technologically feasible and cost-effective strategies that will serve as the framework to achieve the 2030 GHG target and define the state's climate change priorities to 2030 and beyond. The strategies' "known commitments" include implementing renewable energy and energy efficiency (including the mandates of SB 350), increased stringency of the Low Carbon Fuel Standard, measures identified in the Mobile Source and Freight Strategies, measures identified in the proposed Short-Lived Climate Pollutant Plan, and increased stringency of SB 375 targets. To fill the gap in additional reductions needed to achieve the 2030 target, the Second Update recommends continuing the Cap-and-Trade Program and a measure to reduce GHGs from refineries by 20%.

For local governments, the Second Update replaced the initial Scoping Plan's 15% reduction goal with a recommendation to aim for a community-wide goal of no more than 6 MT CO₂e per capita

by 2030 and no more than 2 MT CO_{2e} per capita by 2050, which are developed around the scientifically based levels necessary to limit global warming below 2°C.

The Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32, SB 32, and the EOs; it also establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. A project is considered consistent with the statutes and EOs if it would meet the general policies in reducing GHG emissions in order to facilitate the achievement of the state's goals and would not impede attainment of those goals. As discussed in several cases, a given project need not be in perfect conformity with each and every planning policy or goal to be consistent. A project would be consistent if it would further the objectives and not obstruct their attainment.

Finally, in September 2018, EO B-55-18 was issued, which establishes a statewide policy for the state to achieve carbon neutrality as soon as possible (no later than 2045) and achieve and maintain net negative emissions thereafter. The goal is an addition to the existing statewide targets of reducing the state's GHG emissions. CARB will work with relevant state agencies to ensure that future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal.

Building Energy

Energy used within buildings contributes to GHG emissions from power generation. The Scoping Plan and statewide GHG reduction regulations recognize the importance of improving energy-efficiency of buildings as a component for attaining the state's GHG emission goals. As discussed in more detail in Section 3.5 of this EIR, energy efficiency of buildings is regulated through the California Building Standards Code, specifically through the Building Energy Efficiency Standards under Part 6 of Title 24. The current Title 24 standards are the 2019 Title 24 building energy efficiency standards, which became effective January 1, 2020; and the Title 24 standards are updated every three years.

In addition, the California Green Building Standards Code (Part 11 of Title 24), which is commonly referred to as California's Green Building Standards (CALGreen), establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The 2019 CALGreen standards are the current applicable standards; these are also updated every three years.

Renewable Energy and Energy Procurement

Through several legislative actions and EOs, California has established policies and regulations that require use of renewable energy generation sources throughout the state. This includes the Renewables Portfolio Standard (RPS) program, which sets minimum standards for utility providers to obtain energy from renewable sources. The current goals are to have renewable energy sources for 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030.

Mobile Sources

The transportation sector accounts for more than half of California's CO₂ emissions, thus increasing the fuel efficiency of motor vehicles is another key component to the statewide GHG emission reduction strategies. However, efforts by the state to regulate vehicle emissions have precluded by federal action, particularly publication by the EPA and NHTSA of the SAFE Vehicles Rule, which revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California.

EO S-1-07 (January 2007, implementing regulation adopted in April 2009) sets a declining Low Carbon Fuel Standard for GHG emissions measured in CO₂e grams per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard was to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020 (17 CCR 95480 et seq.). The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel—including extraction/feedstock production, processing, transportation, and final consumption—per unit of energy delivered.

Water

In response to the drought conditions in the state, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the EO extended through February 28, 2016, although many of the directives have become permanent water-efficiency standards and requirements. The EO includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources has modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increases the requirements for landscape water use efficiency and broadens its applicability to include new development projects with smaller landscape areas.

Solid Waste

In 1989, AB 939, known as the Integrated Waste Management Act (California Public Resources Code, Sections 40000 et seq.), mandated a reduction of waste being disposed where jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by 2000.

AB 341 amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery to develop strategies to achieve the state's policy goal.

AB 1826 (Chapter 727, Statutes of 2014, effective 2016) requires businesses to recycle their organic waste (i.e., food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste) depending on the amount of waste they generate per week. This law also requires local jurisdictions across the state to implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units. The minimum threshold of organic waste generation by businesses decreases over time, which means an increasingly greater proportion of the commercial sector will be required to comply.

Sustainable Community Strategies

Under SB 375 (California Government Code Section 65080), the state addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 requires CARB to adopt regional GHG-reduction targets for the automobile and light-truck sector for 2020 and 2035, and to update those targets every 8 years. SB 375 requires the state's 18 regional metropolitan planning organizations (MPOs) to prepare a Sustainable Communities Strategy (SCS) as part of their Regional Transportation Plan that will achieve the GHG-reduction targets set by CARB. If an MPO is unable to devise an SCS to achieve the GHG-reduction target, the MPO must prepare an Alternative Planning Strategy demonstrating how the GHG-reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

A SCS does not: (i) regulate the use of land; (ii) supersede the land use authority of cities and counties; or (iii) require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it (California Government Code Section 65080(b)(2)(K)). Nonetheless, SB 375 makes regional and local planning agencies responsible for developing

those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

Local Regulations

San Joaquin Valley Air Pollution Control District

SJVAPCD has adopted the Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009). The guidance relies on the use of performance-based standards, otherwise known as Best Performance Standards (BPS) to assess significance of project-specific GHG emissions on global climate change during the environmental review process. For development projects (rather than stationary sources of GHG emissions), the recommended BPS focus on measures that improve energy efficiency and those that reduce vehicle miles travelled. The SJVAPCD Guidance states that a project that implements BPS and reduces emissions to 29% below the “business as usual” scenario could be determined to have a less than significant impact related to GHG emissions. This 29% reduction threshold was originally developed in preparation of the first Scoping Plan, discussed above. Many Lead Agencies applied this reduction from the Scoping Plan to individual projects as a threshold of significance. This approach was invalidated by the California Supreme Court unless specific analysis and evidence supports a finding that the statewide reduction target would also be directly applicable to a particular project or jurisdiction. The SJVAPCD Guidance does not demonstrate that this threshold is sufficient to ensure attainment of the regional GHG targets developed by CARB under SB 375, and thus this threshold is not relied upon in this EIR.

Merced County Association of Governments

The Merced County Association of Governments (MCAG) is the regional planning agency for Merced County and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. MCAG serves as the federally designated metropolitan planning organization (MPO) for Merced County. MCAG has prepared the 2018 Regional Transportation Plan and Sustainable Communities Strategy (2018 RTP/SCS) for the region (MCAG 2018).

The 2018 RTP/SCS emphasizes the need for local initiatives that can reduce the region’s GHG emissions that contribute to climate change, an issue that is largely outside the focus of local attainment plans, which is assessed in Section 8 of the 2018 RTP/SCS. The 2018 RTP/SCS also emphasizes the need for better coordination of land use and transportation planning, which heavily influences the emissions inventory from the transportation sectors of the economy. This also minimizes land use conflicts, such as residential development near freeways, industrial areas, or other sources of air pollution.

City of Merced

Climate Action Plan

In November 2009, the City Council accepted Energy Efficiency and Conservation Block Grant (EECBG) funds from the Federal Department of Energy to undertake several projects to increase energy efficiency. One of these projects was preparation and adoption of a Climate Action Plan (CAP). The City's CAP is a stand-alone community-based policy document that establishes a goal to reduce GHG emissions and a variety of implementation actions that will help to achieve broadly-supported community values including: 1) protecting water and air resources; 2) reducing the waste-stream to the landfill; 3) improving energy-efficiency; 4) enhancing choice in mobility; and 5) creating healthy and livable communities. The CAP identifies GHG reduction opportunities from a wide variety of sources in the community, including but not limited to transportation, buildings, and water conservation, and it relies on incentive-based actions, communication-based actions, and encouragement-based actions to reach the defined goals.

The CAP recognizes that the City and larger region is expected to grow substantially, but that growth can and must occur in a manner that allows the City to achieve its GHG reduction goals. The CAP notes that the "urban village" concept that informs the City's General Plan encourages transit-oriented development and mixed-use development, "which are foundational elements of reducing GHG emissions through land use planning" (Merced 2009).

City of Merced Vision 2030 General Plan

The Merced Vision 2030 General Plan was adopted by the Merced City Council in January 2012 and establishes the following policies that are relevant to consideration of potential GHG emissions from new development:

Policy UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

Policy T-1.6 Minimize adverse impacts on the environment from existing and proposed road systems.

Policy OS-5.2 Protect soil resources from the erosive forces of wind and water.

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-1.7 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.

3.7.4 Impacts

Methods of Analysis

The issue of global climate change is inherently a cumulative issue as the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the project's impact to climate change is addressed only as a cumulative impact. To provide a full understanding of the project's potential contribution to climate change, the project's short-term construction-related and long-term operational GHG emissions were estimated using the CalEEMod software. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, and water use.

Thresholds of Significance

The following significance criteria are used for the purposes of analysis in this EIR. A significant impact related to greenhouse gases would occur if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment by generating more than 10,000 metric tons of CO₂e per year during construction and/or by generating more than 4.6 metric tons of CO₂e per service population (residents and employees) per year.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Impacts and Mitigation Measures

Impact 3.7-1: Implementation of the proposed project may generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. This would be a less-than-significant impact.

The Crossings

Construction

Construction of the project would result in GHG emissions primarily associated with the use of off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. CalEEMod Version 2016.3.2 was used to calculate the annual GHG emissions based on the construction scenario described in Section 3.3 (Air Quality). The construction equipment assumptions utilized in the CalEEMod model are summarized in Appendix D and are based on the default number of equipment in addition to construction phasing information supplied by the project applicant. Table 3.7-1 presents the project's construction CO₂E emissions from January 2021¹ to March 2023. Detailed modeling outputs are also provided in Appendix D. As shown in Table 3.7-1, GHG emissions in each year of construction would remain well-below 10,000 MT CO₂E and thus construction emissions would remain **less than significant**.

**Table 3.7-1
Project Estimated Annual Construction GHG Emissions**

Year	Emissions (MT CO ₂ E)
2021	1,025
2022	1,318
2023	160

Source: Appendix D

¹ The analysis assumes a construction start date of January 2021, which represented the earliest date construction would initiate at the time that the modeling was conducted. Assuming the earliest start date for construction represents the worst-case scenario for GHG emissions because equipment and vehicle emission factors for later years would be slightly less due to more stringent standards for in-use off-road equipment and heavy-duty trucks, as well as fleet turnover replacing older equipment and vehicles in later years. Thus, the fact that construction would occur later than the dates used for modeling does not invalidate the modeling results. Impacts would be the same or less than those identified herein.

Operation

Operation of the project would result in GHG emissions from vehicular traffic, area sources (e.g., natural gas combustion and landscaping), electrical generation, water supply, and solid waste as described below.

Vehicular Traffic Trip rates and traffic volumes provided in the project's Transportation Impact Study were incorporated into CalEEMod in order to match the daily trips identified in the project traffic impact analysis, included as Appendix M of this EIR. CalEEMod default mobile source data, including temperature, trip characteristics, variable start information, emission factors, and trip distances, were used for the model inputs. Operational emissions were modeled in CalEEMod under the assumption that the project would be fully operational by 2023.

Electrical Generation The estimation of operational energy emissions was based on CalEEMod land use defaults and number of dwelling units included as a part of the project. Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for PG&E and adjusted to account for achievement of the 33% renewable portfolio standard in 2020 and future years.

The project would also be required to comply with the California Building Energy Efficiency Standards (Title 24, Part 6, of the California Code of Regulations) that are in effect at the time that building permits are issued. A portion of the additional energy efficiency resulting from compliance with the Building Code is reflected in the CalEEMod modeling, but it is not possible to reflect all of the additional energy efficiency in the model and thus emissions would be somewhat lower than stated herein.

Area Sources CalEEMod was used to estimate GHG emissions from the project site area sources, which include gasoline-powered landscape maintenance equipment.

Water Supply and Wastewater Water supplied to the project requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. The CalEEMod modeling assumes that the project would install use of low-flow water fixtures and other water-saving devices as stated within Chapter 3, Project Description.

Solid Waste The project would generate solid waste and would therefore result in GHG emissions associated with landfill off-gassing.

The estimated GHG emissions during project operation associated with for landscape maintenance, energy usage, motor vehicles, solid waste generation, water supply, and

wastewater treatment, and the estimated per capita GHG emissions are shown in Table 3.7-2. The estimates generated under CalEEMod reflect energy use under the 2019 Building Code, which has increased requirements for energy efficiency compared to the 2016 Building Code. This includes requiring that photovoltaic panels are installed on multi-family residential structures of three stories or less at the time of construction. The California Energy Commission estimated that under the 2019 Building Code, residential energy use would be reduced compared to buildings constructed under the 2016 Building Code by 7 percent due to improved energy efficiency and reduced a further 46 percent due to the provision of rooftop solar electricity generation. The CalEEMod estimates also reflect the 2018 Power Content Label for PG&E, which identifies the sources of electricity generation and the resulting GHG emissions, was used. Under the RPS program, PG&E is required to increase the amount of energy that comes from renewable sources, which would reduce the associated GHG emissions in future years.

According to US Census data, the City has an average household size of 3.2 persons. With the proposed 552 apartment units and 18 extended stay units, the project would support a residential population of 1,824 residents. The residential and commercial uses included in the project are expected to support approximately 147 employees. Based on the total emissions of 6,848 MT CO₂E and the project's estimated service population of 1,971 people, the project is expected to generate approximately 3.34 MT CO₂E per capita. This remains well-below the threshold of 4.6 MT CO₂E per capita, thus the impact would be **less than significant**.

Table 3.7-2
Estimated Annual Operational Greenhouse Gas Emissions

Emission Source	Emissions (MT CO₂E per year)
Area	294
Energy	806
Mobile	5,227
Solid Waste	213
Water Supply and Wastewater	45
Total Emissions	6,585
Emissions Per Capita	3.34

Source: Appendix D

Remainder Area

Although no development is proposed within the Remainder Area at this time, the portions of the Remainder Area that are proposed to be zoned R-1-10 could support single-family residential

development in the future. Because new construction would be subject to the 2019 Building Code or later versions, new homes constructed within the Remainder Area would also be required to meet stringent energy-efficiency and solar energy generation standards. Additionally, any new homes constructed within the Remainder Area would be expected to have similar traffic patterns as the residences within The Crossings, as discussed in Section 3.12 and Appendix M. Thus the GHG emissions associated with future residential development in the Remainder Area would be similar to those of The Crossings and would be expected to remain **less than significant**.

Mitigation Measures

No mitigation measures are required.

Impact 3.7-2: Implementation of the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. This would be a less-than-significant impact.

The Crossings

The City's General Plan EIR found that implementation of General Plan policies designed to reduce GHG emissions would ensure that buildout of the General Plan would be consistent with GHG reduction plans, policies, and regulations. The proposed project would be consistent with many of these General Plan policies. For example, the project would extend the City boundaries in an area that is contiguous with existing development in the City and would support the City's policy of ensuring a compact urban form. The project also meets the City's policies regarding the Urban Village concept by proposing a mixed-used development combining multi-family and commercial uses. This would provide good access to shopping, employment, and services for project residents and would improve access to shopping, employment and services for existing residents in this portion of the City. Further, the site is within approximately 2 miles of Merced College and approximately 3.5 miles of UC Merced.

The City's General Plan EIR was prepared in 2010, and thus pre-dates many of the applicable plans, policies, and regulations discussed in Section 3.7-3 above. Regarding consistency with SB 32 (goal of reducing GHG emissions to 40 percent below 1990 levels by 2030) and EO S-3-05 (goal of reducing GHG emissions to 80 percent below 1990 levels by 2050), there are no established protocols or thresholds of significance for that future-year analysis. However, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the *First Update to the Climate Change Scoping Plan* that "California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32" (CARB 2014). With regard to the 2050 target for reducing GHG emissions to

80% below 1990 levels, the *First Update to the Climate Change Scoping Plan* states the following (CARB 2014):

This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions (CARB 2014).

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05. This is confirmed in *California's 2017 Climate Change Scoping Plan (2017 Scoping Plan)*, which states, "This Plan draws from the experiences in developing and implementing previous plans to present a path to reaching California's 2030 GHG reduction target. The *2017 Scoping Plan* is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state" (CARB 2017b). The *2017 Scoping Plan* also states that although "the Scoping Plan charts the path to achieving the 2030 GHG emissions reduction target, we also need momentum to propel us to the 2050 statewide GHG target (80 percent below 1990 levels). In developing this Scoping Plan, we considered what policies are needed to meet our mid-term and long-term goals" (CARB 2017b).

Because the local, regional, and statewide planning documents do not provide specific direction that can be readily applied to the analysis of an individual project-level analysis, it is common to rely on GHG efficiency metrics in order to assess if projects could meet the state's GHG reduction goals. As previously discussed, project-generated operational GHG emissions would not exceed the efficiency threshold of 4.6 MT CO₂E per service population per year. As such, the project would be consistent with regional GHG reduction targets. Overall, the proposed project would not conflict with any other applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions and this impact would be **less than significant**.

Remainder Area

Although no development is proposed within the Remainder Area at this time, the portions of the Remainder Area that are proposed to be zoned R-1-10 could support single-family residential development in the future. Any new homes constructed within the Remainder Area would be contiguous to existing development within the City, and proximate to the commercial land uses

proposed in The Crossings. Thus, any such future residential development would be consistent with the City's General Plan policies intended to reduce GHG emissions, as discussed for The Crossings component above, and such future development would not be expected to conflict with any other applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions. This impact would be **less than significant**.

Mitigation Measures

No mitigation measures are required.

3.7.5 Cumulative Impacts

Impact 3.7-3: The proposed project would not make a cumulatively considerable contribution to emissions of greenhouse gases in the cumulative scenario. This would be a less-than-significant impact.

The issue of global climate change is inherently a cumulative issue as the GHG emissions of individual projects cannot be shown to have any material effect on the global climate. The cumulative context for climate change comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe, and no single project would reasonably be expected to contribute to a noticeable incremental change to the global climate. Subsequently, California has established legislation and regulatory measures providing a statewide context for developing an enforceable statewide cap on GHG emissions. Given the environmental consequences resulting from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs, even relatively small (on a global basis) contributions.

Thus, the analysis of proposed project's impact related to GHG emissions presented in Impacts 3.7-1 and 3.7-2 above addresses the project's contribution to this significant cumulative impact. Because project-generated GHG emissions would remain below the applicable threshold of significance and the project would not conflict with local, regional, or state plans, policies, and regulations intended to reduce GHG emissions, the proposed project would have a **less than significant** impact with regards to cumulatively considerable GHG emissions.

3.7.6 References Cited

CAPCOA (California Air Pollution Control Officers Association). 2017. *California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3.2*. Prepared by BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts. November 2017. Accessed August 2018. http://www.aqmd.gov/docs/default-source/caleemod/01_user-39-s-guide2016-3-2_15november2017.pdf?sfvrsn=4

- CALGreen (California Green Building Code). 2019. 2019 Green Building Standards Code. <https://codes.iccsafe.org/public/document/details/toc/657>.
- CARB (California Air Resources Board). 2008. *Climate Change Scoping Plan: A Framework for Change*. December 12, 2008. <http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf>.
- CARB. 2011a. Final Supplement to the AB 32 Scoping Plan Functional Equivalent Document. Released August 19, 2011. https://www.arb.ca.gov/cc/scopingplan/document/final_supplement_to_sp_fed.pdf.
- CARB. 2011b. “Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider the “LEV III” Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards and Test Procedures and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles.” December 7, 2011. <https://www.arb.ca.gov/regact/2012/leviiidtc12/dtcisor.pdf>.
- CARB. 2014. *First Update to the Climate Change Scoping Plan Building on the Framework Pursuant to AB 32 – The California Global Warming Solutions Act of 2006*. May 2014. http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf.
- CARB. 2016. “AB 32 Scoping Plan.” CARB Website Tracking Progress on the 2030 Scoping Plan Update. December 2, 2016. <https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>.
- CARB 2017a. “Glossary of Terms Used in GHG Inventories.” Last updated June 6, 2017. https://www.arb.ca.gov/cc/inventory/fag/ghg_inventory_glossary.htm.
- CARB. 2017b. *The 2017 Climate Change Scoping Plan Update: The Proposed Strategy for Achieving California’s 2030 Greenhouse Gas Target*. January 20, 2017. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf.
- CARB. 2018. *California Greenhouse Gas Inventory for 2000–2016 by Category as Defined in the 2008 Scoping Plan*. Last updated June 22, 2018. https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf.
- CAT (California Climate Action Team). 2006. *Final 2006 Climate Action Team Report to the Governor and Legislature*. Sacramento, California: CAT. March 2006.

http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF.

CAT. 2010. *Climate Action Team Biennial Report*. Sacramento, California: CAT. April 2010. <http://www.energy.ca.gov/2010publications/CAT-1000-2010-004/CAT-1000-2010-004.PDF>.

CCCC (California Climate Change Center). 2012. *Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California*. July 2012. <http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf>.

CEC (California Energy Commission). 2015a. 2016 Building Energy Efficiency Standards – Frequently Asked Questions. http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.

CEC. 2015b. *2015 Integrated Energy Policy Report*. CEC-100-2015-001-CMF. Accessed September 25, 2017. http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-01/TN212017_20160629T154354_2015_Integrated_Energy_Policy_Report_Small_File_Size.pdf.

City of Merced. 2012a. *City of Merced 2030 General Plan*. Adopted January 2012. <https://www.cityofmerced.org/departments/development-services/planning-division/merced-vision-2030-general-plan>.

City of Merced. 2012b. *City of Merced 2030 General Plan EIR*. Adopted January 2012. <https://www.cityofmerced.org/departments/development-services/planning-division/merced-vision-2030-general-plan-adoption>.

CNRA (California Natural Resources Agency). 2009a. *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008*. http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.

CNRA. 2009b. *Final Statement of Reasons for Regulatory Action: Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to SB 97*. December 2009.

CNRA. 2014. *Safeguarding California: Reducing Climate Risk: An Update to the 2009 California Climate Adaptation Strategy*. July 2014. http://resources.ca.gov/docs/climate/Final_Safeguarding_CA_Plan_July_31_2014.pdf.

- CNRA. 2016. *Safeguarding California: Implementation Action Plans*. March.
<http://resources.ca.gov/docs/climate/safeguarding/Safeguarding%20California-Implementation%20Action%20Plans.pdf>.
- CNRA. 2017. *Draft Report Safeguarding California Plan: 2017 Update*. May 2017.
<http://resources.ca.gov/wp-content/uploads/2017/05/DRAFT-Safeguarding-California-Plan-2017-Update.pdf>.
- CNRA. 2018. *Safeguarding California Plan: 2018 Update*. January 2018.
<http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf>.
- County of Merced. 2013a. *2030 Merced County General Plan*. Adopted December 2013.
- County of Merced. 2013b. *2030 Merced County General Plan EIR*. Adopted December 2013.
- CPUC (California Public Utilities Commission). 2013. "California's Zero Net Energy Policies and Initiatives." September 18, 2013.
<http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=10718>.
- CPUC. 2015. Renewables Portfolio Standard. SB 350 Clean Energy and Pollution Reduction Act of 2015. Approved October 7, 2015.
- EPA (U.S. Environmental Protection Agency). 2007. Energy Independence and Security Act of 2007. <https://www.gpo.gov/fdsys/pkg/BILLS-110hr6enr/pdf/BILLS-110hr6enr.pdf>.
- EPA. 2016. "Glossary of Climate Change Terms." August 9, 2016.
<https://www3.epa.gov/climatechange/glossary.html>.
- EPA. 2017a. "Climate Change." Last updated January 19, 2017.
<https://www.epa.gov/climatechange>.
- EPA. 2017b. *Carbon Pollution Standards for Cars and Light Trucks to Remain Unchanged Through 2025*. January 13 2017. <https://www.epa.gov/newsreleases/carbon-pollution-standards-cars-and-light-trucks-remain-unchanged-through-2025>.
- EPA. 2018. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2016*. EPA 430-R-18-003. https://www.epa.gov/sites/production/files/2018-01/documents/2018_complete_report.pdf.

- EPA and NHTSA (Department of Transportation's National Highway Traffic Safety Administration). 2016. *Regulations and Standards: Heavy-Duty. EPA and DOT Finalize Greenhouse Gas and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles*. Last updated on August 30, 2016. <https://www.epa.gov/newsreleases/epa-and-dot-finalize-greenhouse-gas-and-fuel-efficiency-standards-heavy-duty-trucks-0>.
- IPCC (Intergovernmental Panel on Climate Change). 1995. *IPCC Second Assessment Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the U.N. Framework Convention on Climate Change*.
- IPCC. 2007. "Summary for Policymakers." In *Climate Change 2007: The Physical Science Basis*, edited by S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller, 1–18. A Report of Working Group I of the IPCC. New York, New York, Cambridge University Press. <https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>.
- 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*. Edited by T.F. Stocker, D. Qin, G.K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley. New York, New York: Cambridge University Press. http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf.
- IPCC. 2014. *Climate Change 2014: Synthesis Report*. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf.
- MCAG (Merced County Association of Governments). 2018. *2018 Regional Transportation Plan and Sustainable Communities Strategy*. August 2018. <https://www.mcagov.org/307/2018-RTP>.
- OPR (California Governor's Office of Planning and Research). 2008. *Technical Advisory – CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*. <http://opr.ca.gov/docs/june08-ceqa.pdf>.
- SJVAPCD (San Joaquin Valley Air Pollution Control District). 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf.
- SJVAPCD. 2009. *Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*.

INTENTIONALLY LEFT BLANK