5.7 GREENHOUSE GAS EMISSIONS

This section of the updated Draft Program Environmental Impact Report (PEIR) evaluates the potential for implementation of the updated General Plan to cumulatively contribute to greenhouse gas (GHG) emissions impacts. Because no single plan is large enough to result in a measurable increase in global concentrations of GHG, climate change impacts are considered on a cumulative basis.

This evaluation is based on the methodology recommended by the South Coast Air Quality Management District (South Coast AQMD). GHG emissions modeling was conducted using the California Emissions Estimator Model (CalEEMod), version 2016.3.2, and model outputs are in Volume III, Appendix C.

Terminology

The following are definitions for terms used throughout this section.

- **Greenhouse gases (GHG).** Gases in the atmosphere that absorb infrared light, thereby retaining heat in the atmosphere and contributing to a greenhouse effect.
- **Global warming potential (GWP).** Metric used to describe how much heat a molecule of a greenhouse gas absorbs relative to a molecule of carbon dioxide (CO_2) over a given period of time (20, 100, and 500 years). CO_2 has a GWP of 1.
- **Carbon dioxide-equivalent (CO_2e).** The standard unit to measure the amount of greenhouse gases in terms of the amount of CO_2 that would cause the same amount of warming. CO_2e is based on the GWP ratios between the various GHGs relative to CO_2.
- **$MTCO_2e$.** Metric ton of CO_2e.
- **$MMTCO_2e$.** Million metric tons of CO_2e.

5.7.1 Environmental Setting

5.7.1.1 GREENHOUSE GASES AND CLIMATE CHANGE

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHGs, to the atmosphere. The "greenhouse effect" is the natural process that retains heat in the troposphere, which is the bottom layer of the atmosphere. Without the greenhouse effect, thermal energy would escape into space, resulting in a much colder and inhospitable planet. GHGs are the components of the atmosphere responsible for the greenhouse effect. The amount of heat that is retained is proportional to the concentration of GHGs in the atmosphere. As more GHGs are released into the atmosphere, GHG concentrations increase and the atmosphere retains more heat, increasing the effects of climate change.

The primary source of these GHGs is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHGs—water vapor, carbon dioxide (CO_2), methane (CH_4), and ozone (O_3)—that

are the likely cause of an increase in global average temperatures observed in the 20th and 21st centuries. Other GHGs identified by the IPCC that contribute to global warming to a lesser extent are nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001).[1,2] The major GHGs applicable to the General Plan update are briefly described.

- **Carbon dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in landfills and water treatment facilities.

- **Nitrous oxide (N_2O)** is emitted during agricultural and industrial activities as well as during the combustion of fossil fuels and solid waste.

GHGs are dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Some GHGs have a stronger greenhouse effect than others. These are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 5.7-1. The GWP is used to convert GHGs to CO_2-equivalence (CO_2e) to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For example, under IPCC's Fourth Assessment Report (AR4) GWP values for CH_4, 10 MT of CH_4 would be equivalent to 250 MT of CO_2.

[1] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant because it is considered part of the feedback loop rather than a primary cause of change.

[2] Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (CARB 2017a). However, state and national GHG inventories do not include black carbon due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

Table 5.7-1 GHG Emissions and Their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report Atmospheric Lifetime (Years)	Fourth Assessment Report Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	50 to 200	1	1
Methane[2] (CH_4)	12 (±3)	12	21	25
Nitrous Oxide (N_2O)	120	114	310	298

Source: IPCC 1995, 2007.

Notes: The IPCC published updated GWP values in its Fifth Assessment Report (2013) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2. However, GWP values identified in AR4 are used to maintain consistency in statewide GHG emissions modeling. In addition, the 2014 Scoping Plan update was based on the GWP values in AR4.

[1] Based on 100-year time horizon of the GWP of the air pollutant compared to CO_2.

[2] The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

California's GHG Sources and Relative Contribution

In 2019, the statewide GHG emissions inventory was updated for 2000 to 2017 emissions using the GWPs in IPCC's AR4.[3] Based on these GWPs, California produced 424.10 $MMTCO_2e$ GHG emissions in 2017. The California Air Resources Board (CARB) categorizes GHG generation into the following seven sectors (CARB 2019b).

- **Transportation.** Consists of direct tailpipe emissions from on-road vehicle and direct emissions from off-road transportation mobile sources, intrastate aviation, rail, and watercraft. Emissions are generated from the combustion of fuels in on- and off-road vehicles in addition to aviation, rail, and ships.

- **Electric.** Includes emissions from in-state power generation (including the portion of cogeneration emissions attributed to electricity generation) and emissions from imported electricity.

- **Industrial.** Includes emissions primarily driven by fuel combustion from sources that include refineries, oil and gas extraction, cement plants, and the portion of cogeneration emissions attribute to thermal energy output.

- **Commercial and Residential.** Accounts for emissions generated from combustion of natural gas and other fuels for household and commercial business use, such as space heating, cooking, and hot water or steam generation. Emissions associated with electricity usage are accounted for in the Electric Sector.

- **Recycling and Waste.** Consists of emissions generated at landfills and from commercial-scale composting.

- **Agriculture.** Primarily includes methane (CH_4) and nitrous oxide (N_2O) emissions generated from enteric fermentation and manure management from livestock. Also accounts for emissions associated with crop

[3] Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under Assembly Bill 32 (2006).

production (fertilizer use, soil preparation and disturbance, and crop residue burning) and fuel combustion associated with stationary agricultural activities (e.g., water pumping, cooling or heating buildings).

- **High Global Warming Potential Gases.** Associated with substitutes for ozone-depleting substances, emissions from electricity transmission and distribution system, and gases emitted in the semiconductor manufacturing process. Substitutes for ozone-depleting substances are used in refrigeration and air conditioning equipment, solvent cleaning, foam production, fire retardants, and aerosols.

California's transportation sector was the single largest generator of GHG emissions, producing 40.1 percent of the state's total emissions. Industrial sector emissions made up 21.1 percent, and electric power generation made up 14.7 percent of the state's emissions inventory. Other major sectors of GHG emissions include commercial and residential (9.7 percent), agriculture and forestry (7.6 percent), high GWP (4.7 percent), and recycling and waste (2.1 percent) t (CARB 2019a).

California's GHG emissions have followed a declining trend since 2007. In 2017, emissions from routine GHG-emitting activities statewide were 424 $MMTCO_2e$, 5 $MMTCO_2e$ lower than 2016 levels. This represents an overall decrease of 14 percent since peak levels in 2004 and 7 $MMTCO_2e$ below the 1990 level and the state's 2020 GHG target. During the 2000 to 2017 period, per capita GHG emissions in California continued to drop from a peak in 2001 of 14.0 $MTCO_2e$ per capita to 10.7 $MTCO_2e$ per capita in 2017, a 24 percent decrease. Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product) has declined 41 percent since the 2001 peak, while the state's gross domestic product has grown 52 percent during the same period. For the first time since California started to track GHG emissions, California uses more electricity from zero-GHG sources (hydro, solar, wind, and nuclear energy) (CARB 2019b).

Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHGs in the atmosphere remained relatively constant. During the 20th century, however, scientists observed a rapid change in the climate and the quantity of climate change pollutants in the Earth's atmosphere that is attributable to human activities. The amount of CO_2 in the atmosphere has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million per year since 1960, mainly due to combustion of fossil fuels and deforestation (IPCC 2007). These recent changes in the quantity and concentration of climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is warming at a rate that cannot be explained by natural causes alone. Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants (CAT 2006). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, etc. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic time frame but within a human lifetime (IPCC 2007).

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the Earth's temperature are hard to predict. Projections of climate change depend heavily upon future human activity. Therefore, climate models are based on different emission scenarios that account for historical trends in emissions and on observations of the climate record that assess the human

influence of the trend and projections for extreme weather events. Climate-change scenarios are affected by varying degrees of uncertainty. For example, there are varying degrees of certainty on the magnitude of the trends for:

- Warmer and fewer cold days and nights over most land areas.
- Warmer and more frequent hot days and nights over most land areas.
- An increase in frequency of warm spells/heat waves over most land areas.
- An increase in frequency of heavy precipitation events (or proportion of total rainfall from heavy falls) over most areas.
- Larger areas affected by drought.
- Intense tropical cyclone activity increases.
- Increased incidence of extreme high sea level (excluding tsunamis).

Potential Climate Change Impacts for California

Observed changes over the last several decades across the western United States reveal clear signs of climate change. Statewide, average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). The years from 2014 through 2016 have shown unprecedented warm temperatures, with 2014 being the warmest (OEHHA 2018). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1 to 8.6°F, depending on emissions levels (CCCC 2012).

In California and western North America, observations of the climate have shown: 1) a trend toward warmer winter and spring temperatures; 2) a smaller fraction of precipitation falling as snow; 3) a decrease in the amount of spring snow accumulation in the lower and middle elevation mountain zones; 4) advanced shift in the timing of snowmelt of 5 to 30 days earlier in the spring; and 5) a similar shift (5 to 30 days earlier) in the timing of spring flower blooms (CAT 2006). Overall, California has become drier over time, with five of the eight years of severe to extreme drought occurring between 2007 and 2016, with unprecedented dry years occurring in 2014 and 2015 (OEHHA 2018). Statewide precipitation has become increasingly variable from year to year, with the driest consecutive four years occurring from 2012 to 2015 (OEHHA 2018). According to the California Climate Action Team—a committee of state agency secretaries and the heads of agencies, boards, and departments, led by the Secretary of the California Environmental Protection Agency—even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 5.7-1), and the inertia of the Earth's climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are now considered unavoidable. Global climate change risks to California are shown in Table 5.7-2 and include impacts to public health, water resources, agriculture, coastal sea level, forest and biological resources, and energy.

Table 5.7-2 Summary of GHG Emissions Risks to California

Impact Category	Potential Risk
Public Health Impacts	Heat waves will be more frequent, hotter, and longer Fewer extremely cold nights Poor air quality made worse Higher temperatures increase ground-level ozone levels
Water Resources Impacts	Decreasing Sierra Nevada snow pack Challenges in securing adequate water supply Potential reduction in hydropower Loss of winter recreation
Agricultural Impacts	Increasing temperature Increasing threats from pests and pathogens Expanded ranges of agricultural weeds Declining productivity Irregular blooms and harvests
Coastal Sea Level Impacts	Accelerated sea level rise Increasing coastal floods Shrinking beaches Worsened impacts on infrastructure
Forest and Biological Resource Impacts	Increased risk and severity of wildfires Lengthening of the wildfire season Movement of forest areas Conversion of forest to grassland Declining forest productivity Increasing threats from pest and pathogens Shifting vegetation and species distribution Altered timing of migration and mating habits Loss of sensitive or slow-moving species
Energy Demand Impacts	Potential reduction in hydropower Increased energy demand

Sources: CEC 2006, 2009; CCCC 2012; CNRA 2014.

5.7.2 Regulatory Background

This section describes the federal, state, and local regulations applicable to GHG emissions.

Federal

The US Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 US Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings did not themselves impose any emission reduction requirements but allowed the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation (USEPA 2009).

To regulate GHGs from passenger vehicles, the EPA was required to issue an endangerment finding. The finding identifies emissions of six key GHGs—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world. The first three are applicable to the General Plan update's GHG emissions inventory because they constitute the majority of GHG emissions; they are the GHG emissions that should be evaluated as part of a project's GHG emissions inventory.

US Mandatory Reporting Rule for GHGs (2009)

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 $MTCO_2e$ or more per year are required to submit an annual report.

Update to Corporate Average Fuel Economy Standards (2021 to 2026)

The federal government issued new Corporate Average Fuel Economy (CAFE) standards in 2012 for model years 2017 to 2025, which required a fleet average of 54.5 miles per gallon in 2025. However, on March 30, 2020, the EPA finalized updated CAFE and GHG emissions standards for passenger cars and light trucks and established new standards, covering model years 2021 through 2026, known as the Safer Affordable Fuel Efficient (SAFE) Vehicles Final Rule for Model Years 2021-2026. However, a consortium of automakers and the State of California have agreed on a voluntary framework to reduce emissions that can serve as an alternative path forward for clean vehicle standards nationwide. Automakers who agreed to the framework are Ford, Honda, BMW of North America, and Volkswagen Group of America. The framework supports continued annual reductions of vehicle greenhouse gas emissions through the 2026 model year, encourages innovation to accelerate the transition to electric vehicles, and gives industry the certainty needed to make investments and create jobs. This commitment means that the auto companies party to the voluntary agreement will only sell cars in the United States that meet these standards (CARB 2019d).

EPA Regulation of Stationary Sources under the Clean Air Act (Ongoing)

Pursuant to its authority under the Clean Air Act, the EPA has been developing regulations for new, large stationary sources of emissions such as power plants and refineries. Under former President Obama's 2013 Climate Action Plan, the EPA was directed to develop regulations for existing stationary sources as well. On June 19, 2019, the EPA issued the final Affordable Clean Energy (ACE) rule which became effective on August 19,2019. The ACE rule was crafted under the direction of President Trump's Energy Independence Executive Order. It officially rescinds the Clean Power Plan rule issued during the Obama Administration and sets emissions guidelines for states in developing plans to limit CO_2 emissions from coal-fired power plants.

State

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in Executive Orders S-03-05 and B-30-15, Assembly Bill (AB) 32, Senate Bill (SB) 32, and SB 375.

Executive Order S-03-05

Executive Order S-03-05, signed June 1, 2005, set the following GHG reduction targets for the state:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

Assembly Bill 32, the Global Warming Solutions Act (2006)

State of California guidance and targets for reductions in GHG emissions are generally embodied in the Global Warming Solutions Act, adopted with passage of AB 32. AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 emissions reduction goal established in Executive Order S-03-05.

CARB 2008 Scoping Plan

The first Scoping Plan was adopted by CARB on December 11, 2008. The 2008 Scoping Plan identified that GHG emissions in California are anticipated to be 596 $MMTCO_2e$ in 2020. In December 2007, CARB approved a 2020 emissions limit of 427 $MMTCO_2e$ (471 million tons) for the state (CARB 2008). To effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 $MTCO_2e$ per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012.

First Update to the Scoping Plan

CARB completed a five-year update to the 2008 Scoping Plan, as required by AB 32. The First Update to the Scoping Plan, adopted May 22, 2014, highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the 2008 Scoping Plan. As part of the update, CARB recalculated the 1990 GHG emission levels with the updated AR4 GWPs; as a result, the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, are slightly higher at 431 $MMTCO_2e$ (CARB 2014).

As identified in the Update to the Scoping Plan, California is on track to meet the goals of AB 32. The update also addresses the state's longer-term GHG goals in a post-2020 element. The post-2020 element provides a high-level view of a long-term strategy for meeting the 2050 GHG goal, including a recommendation for the state to adopt a midterm target. According to the Update to the Scoping Plan, local government reduction targets should chart a reduction trajectory that is consistent with or exceeds the trajectory created by statewide goals (CARB 2014). CARB identified that reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant acceleration of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit (CARB 2014).

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions in the state to 40 percent below 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal as well as the long-term goal for 2050 in Executive Order S-03-05. It also requires the Natural Resources Agency to conduct triennial updates of the California adaption strategy, Safeguarding California, in order to ensure climate change is accounted for in state planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed Senate Bill 32 and Assembly Bill 197, making the Executive Order goal for year 2030 into a statewide, mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires the CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

2017 Climate Change Scoping Plan

Executive Order B-30-15 and SB 32 required CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. On December 24, 2017, CARB approved the 2017 Climate Change Scoping Plan Update, which outlines potential regulations and programs, including strategies consistent with AB 197 requirements, to achieve the 2030 target. The 2017 Scoping Plan establishes a new emissions limit of 260 $MMTCO_2e$ for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030 (CARB 2017b).

California's climate strategy will require contributions from all sectors of the economy, including enhanced focus on zero- and near-zero emission vehicle technologies; continued investment in renewables such as solar roofs, wind, and other types of distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conserve agricultural and other lands. Requirements for GHG reductions at stationary sources complement local air pollution control efforts by the local air districts to tighten emissions limits for criteria air pollutants and toxic air contaminants on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing zero-emission (ZE) buses and trucks.
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030).
- Implementation of SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency by 25 percent by 2030 and utilizes near-zero emissions technology and deployment of ZE trucks.

- Implementing the proposed Short-Lived Climate Pollutant Strategy, which focuses on reducing methane and hydrofluorocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- Continued implementation of SB 375.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to these statewide strategies, the 2017 Climate Change Scoping Plan also identified local governments as essential partners in achieving the state's long-term GHG reduction goals and recommended local actions to reduce GHG emissions—for example, statewide targets of no more than 6 $MTCO_2e$ or less per capita by 2030 and 2 $MTCO_2e$ or less per capita by 2050. CARB recommends that local governments evaluate and adopt quantitative, locally appropriate goals that align with the statewide per capita targets and sustainable development objectives, and develop plans to achieve the local goals. The statewide per capita goals were developed by applying the percent reductions necessary to reach the 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to the state's 1990 emissions limit established under AB 32. For CEQA projects, CARB states that lead agencies have discretion to develop evidenced-based numeric thresholds (mass emissions, per capita, or per service population) consistent with the Scoping Plan and the state's long-term GHG goals. To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from vehicle miles traveled (VMT), and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits. Where further project design or regional investments are infeasible or not proven to be effective, CARB recommends mitigating potential GHG impacts through purchasing and retiring carbon credits.

The Scoping Plan scenario is set against what is called the "business as usual" yardstick—that is, what would the GHG emissions look like if the state did nothing at all beyond the policies that are already required and in place to achieve the 2020 limit, as shown in Table 5.7-3. It includes the existing renewables requirements, advanced clean cars, the "10 percent" LCFS, and the SB 375 program for more vibrant communities, among others. However, it does not include a range of new policies or measures that have been developed or put into statute over the past two years. Also shown in the table, the known commitments are expected to result in emissions that are 60 $MMTCO_2e$ above the target in 2030. If the estimated GHG reductions from the known commitments are not realized due to delays in implementation or technology deployment, the post-2020 Cap-and-Trade Program would deliver the additional GHG reductions in the sectors it covers to ensure the 2030 target is achieved.

Table 5.7-3 2017 Climate Change Scoping Plan Emissions Reductions Gap

Modeling Scenario	2030 GHG Emissions $MMTCO_2e$
Reference Scenario (Business-as-Usual)	389
With Known Commitments	320
2030 GHG Target	**260**
Gap to 2030 Target	**60**

Source: CARB 2017b.

Table 5.7-4 provides estimated GHG emissions compared to 1990 levels, and the range of GHG emissions for each sector estimated for 2030.

Table 5.7-4 2017 Climate Change Scoping Plan Emissions Change by Sector

Scoping Plan Sector	1990 $MMTCO_2e$	2030 Proposed Plan Ranges $MMTCO_2e$	% Change from 1990
Agricultural	26	24 to 25	-8% to -4%
Residential and Commercial	44	38 to 40	-14% to -9%
Electric Power	108	30 to 53	-72% to -51%
High GWP	3	8 to 11	267% to 367%
Industrial	98	83 to 90	-15% to -8%
Recycling and Waste	7	8 to 9	14% to 29%
Transportation (including TCU)	152	103 to 111	-32% to -27%
Net Sink[1]	-7	TBD	TBD
Sub Total	**431**	**294 to 339**	**-32% to -21%**
Cap-and-Trade Program	NA	34 to 79	NA
Total	**431**	**260**	**-40%**

Source: CARB 2017b.
Notes: TCU = Transportation, Communications, and Utilities; TBD = To Be Determined.
[1] Work underway through 2017 was used to estimate the range of potential sequestration benefits from the natural and working lands sector.

Senate Bill 375

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPOs). The Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial.

Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035 (CARB 2010). The 2020 targets are smaller than the 2035 targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 $MMTCO_2e$ of reductions by 2020 and 15 $MMTCO_2e$ of reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

2017 Update to the SB 375 Targets

CARB is required to update the targets for the MPOs every eight years. In June 2017, CARB released updated targets and technical methodology, and released another update in February 2018. The updated targets consider the need to further reduce VMT, as identified in the 2017 Scoping Plan update, while balancing the need for additional and more flexible revenue sources to incentivize positive planning and action toward sustainable communities. Like the 2010 targets, the updated SB 375 targets are in units of percent per capita reduction in GHG emissions from automobiles and light trucks relative to 2005. This excludes reductions anticipated from implementation of state technology and fuels strategies and any potential future state strategies such as statewide road user pricing. The proposed targets call for greater per capita GHG emission reductions from SB 375 than are currently in place, which for 2035, translate into proposed targets that either match or exceed the emission reduction levels in the MPOs' currently adopted sustainable communities strategies (SCS). As proposed, CARB staff's proposed targets would result in an additional reduction of over 8 $MMTCO_2e$ in 2035 compared to the current targets. For the next round of SCS updates, CARB's updated targets for the SCAG region are an 8 percent per capita GHG reduction in 2020 from 2005 levels (unchanged from the 2010 target) and a 19 percent per capita GHG reduction in 2035 from 2005 levels (compared to the 2010 target of 13 percent) (CARB 2018). CARB adopted the updated targets and methodology on March 22, 2018. All SCSs adopted after October 1, 2018, are subject to these new targets.

SCAG's Regional Transportation Plan / Sustainable Communities Strategy

SB 375 requires each MPO to prepare a sustainable communities strategy in its regional transportation plan. For the SCAG region, the 2016-2040 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS) was adopted on April 7, 2016, and is an update to the 2012 RTP/SCS (SCAG 2016). SCAG released the draft 2020-2045 RTP/SCS (Connect SoCal); adopted the plan for the limited purpose of transportation conformity on May 7, 2020; and will consider the plan in 120 days (SCAG 2020). In general, the SCS outlines a development pattern for the region that, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light duty trucks and thereby reduce GHG emissions from these sources.

Connect SoCal focuses on the continued efforts of the previous RTP/SCSs to integrate transportation and land uses strategies in development of the SCAG region through horizon year 2045 (SCAG 2020). Connect SoCal forecasts that the SCAG region will meet its GHG per capita reduction targets of 8 percent by 2020 and

19 percent by 2035. Additionally, Connect SoCal forecasts that implementation of the plan will reduce VMT per capita in year 2045 by 4.1 percent compared to baseline conditions for that year. Connect SoCal includes a "Core Vision" that centers on maintaining and better managing the transportation network for moving people and goods while expanding mobility choices by locating housing, jobs, and transit closer together, and increasing investments in transit and complete streets (SCAG 2020).

Transportation Sector Regulations

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model years 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under *Federal Laws*, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases with requirements for greater numbers of ZE vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025 new automobiles will emit 34 percent less global warming gases and 75 percent less smog-forming emissions.

Executive Order S-01-07

On January 18, 2007, the state set a new LCFS for transportation fuels sold in the state. Executive Order S-01-07 sets a declining standard for GHG emissions measured in CO_2e gram per unit of fuel energy sold in California. The LCFS requires a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels, and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

Executive Order B-16-2012

On March 23, 2012, the state identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate ZE vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directed the number of ZE vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are ZE by 2015 and at least 25 percent by 2020. The executive order also established a target for the transportation sector of reducing GHG emissions 80 percent below 1990 levels by 2020.

Renewables Portfolio: Carbon Neutrality Regulations

Senate Bills 1078, 107, and X1-2 and Executive Order S-14-08

A major component of California's Renewable Energy Program is the renewables portfolio standard established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. Executive Order S-14-08, signed in November 2008, expanded the state's renewable energy standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SB X1-2). Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects because electricity production from renewable sources is generally considered carbon neutral.

Senate Bill 350

Senate Bill 350 (de Leon) was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100. Under SB 100, the RPS for publicly owned facilities and retail sellers will consist of 44 percent renewable energy by 2024, 52 percent by 2027, and 60 percent by 2030. SB 100 also established a new RPS requirement of 50 percent by 2026. Furthermore, the bill establishes an overall state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18

Executive Order B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." Executive Order B-55-18 directs CARB to work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions should be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

Energy Efficiency Regulations

California Building Code: Building Energy Efficiency Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 and most recently revised in 2019 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of

building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. The 2019 Building Energy Efficiency Standards, which were adopted on May 9, 2018, went into effect starting January 1, 2020.

The 2019 standards move toward cutting energy use in new homes by more than 50 percent and require installation of solar photovoltaic systems for single-family homes and multifamily buildings of three stories and less. The 2019 standards focus on four key areas: 1) smart residential photovoltaic systems; 2) updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa); 3) residential and nonresidential ventilation requirements; 4) and nonresidential lighting requirements (CEC 2018a). Under the 2019 standards, nonresidential buildings are 30 percent more energy efficient compared to the 2016 standards, and single-family homes are 7 percent more energy efficient (CEC 2018b). When accounting for the electricity generated by the solar photovoltaic system, single-family homes would use 53 percent less energy compared to homes built to the 2016 standards (CEC 2018b).

California Building Code: CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (24 CCR, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The mandatory provisions of CALGreen became effective January 1, 2011, and were last updated in 2019. The 2019 CALGreen standards became effective January 1, 2020.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (20 CCR §§ 1601–1608) were adopted by the CEC on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non–federally regulated appliances. Though these regulations are now often viewed as "business as usual," they exceed the standards imposed by all other states, and they reduce GHG emissions by reducing energy demand.

Solid Waste Diversion Regulations

AB 939: Integrated Waste Management Act of 1989

California's Integrated Waste Management Act of 1989, AB 939 (Public Resources Code §§ 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses. Section 5.408 of CALGreen also requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

AB 1327

The California Solid Waste Reuse and Recycling Access Act, AB 1327 (Public Resources Code §§ 42900 et seq.) requires areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

AB 1826

In October of 2014, Governor Brown signed AB 1826 requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses and multifamily residential dwellings with five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed with food waste.

Water Efficiency Regulations

SBX7-7

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 required urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

AB 1881, Water Conservation in Landscaping Act

The Water Conservation in Landscaping Act of 2006, AB 1881 requires local agencies to adopt the updated DWR model ordinance or an equivalent. AB 1881 also requires the CEC to consult with the DWR to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

Short-Lived Climate Pollutant Reduction Strategy

Senate Bill 1383

On September 19, 2016, the governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and methane (CH_4). Black carbon is the light-absorbing component of fine particulate matter produced during incomplete combustion of fuels. SB 1383 required the state board, no later than January 1, 2018, to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The bill also established targets for reducing organic waste in landfills. On March 14, 2017, CARB adopted the Short-Lived Climate Pollutant Reduction Strategy, which identifies the state's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s, despite the tripling of diesel fuel use (CARB 2017a). In-use, on-road rules are expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020.

Local

City of Santa Ana Climate Action Plan

Adopted in December 2015, the Santa Ana Climate Action Plan (CAP) represents the City's commitment to improving its residents' quality of life by reducing carbon pollution and energy use. The CAP elaborates on the goals and policies detailed in the current General Plan, including those mentioned in the General Plan's energy element. In addition, the CAP identifies a number of measures to reduce emissions from five sectors: transportation and land use, energy, solid waste, water, and wastewater. These measures for community-wide reductions are projected to reach the CAP 15 percent reduction goal by 2020 and nearly reach its 30 percent reduction goal for 2035. Measures affecting municipal operations are projected to meet a 30 percent reduction goal by 2020 and 40 percent by 2035.

- **Transportation and Land Use Measures.** The relevant measures identified for the transportation and land use sector include development of 1) local retail service nodes, 2) local residential nodes near retail and employment, 3) local employment nodes near residential and retail areas, 4) a traffic signal synchronization program, and 5) an alternative-fuel vehicle fleet (CAP 2015).

- **Community-Wide and Municipal Energy Measures.** The relevant measures identified for community-wide and municipal energy include programs and policies such as 1) Southern California Edison small and medium business direct install, 2) solar photovoltaic systems, new private installs, 3) Southern California Edison and Southern California Gas Company residential programs, 4) Southern California Gas Company commercial programs, 5) streetlight purchase and retrofit with LED lighting, and 6) Title 24 energy efficiency standards, commercial and residential.

- **Solid Waste, Water, and Wastewater Measures.**. The relevant measures identified for solid waste, water, and wastewater include the Assembly Bill 341 commercial and multifamily recycling program because it would contribute to the reduction of landfill methane emissions.

The CAP also offers implementation and monitoring strategies to achieve its goals. Implementation strategies include proper staffing; partnerships with Southern California Edison (SCE), SoCalGas, and the Santa Ana Chamber of Commerce; outreach and education for the community; and preparation of a time frame for implementation.

5.7.2.1 EXISTING CONDITIONS

Existing Emissions

The existing land uses in Santa Ana consist of single- and multi-family residences, mixed-use development, retail, office, commercial, industrial, and institutional uses. Operation of these land uses generates GHG emissions from natural gas used for energy, heating, and cooking; electricity usage; vehicle trips for employees and residents; area sources such as landscaping equipment and consumer cleaning products; water demand; waste generation; and solid waste generation.[4] Table 5.7-5 shows the emissions associated with existing land uses in the city.

Table 5.7-5 Existing Santa Ana Greenhouse Gas Emissions Inventory

Sector	Existing (CEQA Baseline) GHG Emissions	
	$MTCO_2e$/year	Percent of Total
Transportation	1,463,006	66%
Energy – Residential[1]	208,050	9%
Energy – Nonresidential[1]	432,202	20%
Solid Waste[2]	56,603	3%
Water/Wastewater[3]	34,084	2%
Other – Off-Road Equipment[4]	18,678	1%
Existing Community-Wide Emissions Total	2,212,622	100%
Adjusted Service Population (SP)[5]	460,686	NA
$MTCO_2e$/Year/SP	4.8	NA

Note: Emissions may not total 100 percent due to rounding. Based on IPCC's AR4 GWPs.

1 Energy use makes use of a seven-year (2012–2018) annual electricity consumption average based on data provided by SCE and a five-year (2014–2018) natural gas consumption average based on data provided by SoCalGas. Emissions from electricity use a CO_2e intensity factor of 513 pounds per megawatt hour based on the SCE CO_2 intensity factor reported for year 2018 (SCE 2019) The CH_4 and N_2O intensity factors are from the latest EPA eGRID data (USEPA 2018). Electricity and natural gas use from industrial and permitted facilities may be included with the overall amounts for nonresidential uses, as the 15/15 Rule was triggered.

2 Sources: Landfill Emissions Tool Version 1.3 and CalRecycle. Waste generation based on three-year average (2016–2018) waste commitment for the City obtained from CalRecycle. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's gas capture system. The landfill gas capture efficiency is based on CARB's Local Government Operations Protocol (LGOP), version 1.1. Significant CH_4 production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Therefore, the highest CH_4 emissions from waste disposal in a given year are reported.

3 Source: LGOP, version 1.1, based on the water demand provided by the City. Wastewater generation is assumed to be equal to 95 percent of water use.

4 Consists of light commercial and construction equipment. Light commercial equipment emissions based on employment for City of Santa Ana as a percentage of Orange County and on OFFROAD2017 emission rates for year 2019. Construction equipment emissions based on housing permit data for Orange County and City from the US Census and on OFFROAD2017 emission rates for year 2019.

5 Service population (SP) consists of the aggregate of total employees and population within the study area. When aggregating employees and residents for transportation efficiency, an employee reduction factor was applied to account for overlaps in the two (employees who are also residents). Reduction factors were applied to both the City of Santa Ana employees then aggregated to the resident population. Reduction factors are based on employment data within the SCAG Local Profiles Reports (2019) for the City of Santa Ana. The SCAG reports show that 20.8 percent of employees within the City are also residents of the City (IBI 2020). Consists of approximately 334,774 residents and 158,980 employees in Santa Ana.

4 Emissions from water demand and wastewater are emissions associated with electricity used to supply, treat, and distribute water.

5.7.3 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

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

GHG-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

South Coast Air Quality Management District

South Coast AQMD has adopted a significance threshold of 10,000 $MTCO_2e$ per year for permitted (stationary) sources of GHG emissions for which South Coast AQMD is the designated lead agency. To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, South Coast AQMD convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting (Meeting No. 15) in September 2010, South Coast AQMD identified a tiered approach for evaluating GHG emissions for development projects where it is not the lead agency:

- **Tier 1.** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.

- **Tier 2.** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e. city or county), project-level and cumulative GHG emissions are less than significant.

- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant. For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, South Coast AQMD requires an assessment of GHG emissions. The South Coast AQMD Working Group identified a "bright-line" screening-level threshold of 3,000 $MTCO_2e$ annually for all land-use types. This bright-line threshold is based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions.

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted. South Coast AQMD has identified an efficiency target for projects that exceed the screening threshold. The current recommended approach is per capita efficiency targets. The South Coast AQMD Working Group identified a 2020 efficiency target of 4.8 $MTCO_2e$ per year per service population ($MTCO_2e$/year/SP) for project-level analyses and 6.6 $MTCO_2e$/year/SP for plan-level projects (e.g., general plans). Service population is defined as the sum of the residential and employment populations provided by a project.

Proposed Project Thresholds

If project emissions are below the 3,000 $MTCO_2e$ bright-line screening threshold, GHG emissions impacts would be considered less than significant.

This General Plan Update analysis also analyzes the potential for conflict with the GHG reduction goals established under SB 32 and Executive Order S-03-05, which require a reduction in statewide GHG emissions from existing conditions to achieve a 40 percent reduction in GHG emissions by 2030 and an 80 percent reduction in GHG emissions by 2050, respectively. For a project with a buildout year of 2045, this would be a 70 percent reduction compared to 2020 levels.

Mass Emissions and Health Effects

On December 24, 2018, in the case, *Sierra Club et al. v. County of Fresno et al.* (Friant Ranch), the California Supreme Court determined that the EIR for the proposed Friant Ranch project failed to adequately analyze the project's air quality impacts on human health. The EIR prepared for the project, which involved a master planned retirement community in Fresno County, showed that project-related mass emissions would exceed the San Joaquin Valley Air Pollution Control District's (SJVAPCD) regional significance thresholds. In its findings, the California Supreme Court affirmed the holding of the Court of Appeal that EIRs for projects must not only identify impacts to human health, but also provide an "analysis of the correlation between the project's emissions and human health impacts" related to each criteria air pollutant that exceeds the regional significance thresholds or explain why it could not make such a connection. In general, the ruling focuses on the correlation of emissions of toxic air contaminants and criteria air pollutants and their impact to human health.

In 2009, the US EPA issued an endangerment finding for six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in order to regulate GHG emissions from passenger vehicles. The endangerment finding is based on evidence that shows an increase in mortality and morbidity associated with increases in average temperatures, which increase the likelihood of heat waves and ozone levels. The effects of climate change are identified in Table 4.8-2. While these identified effects such as sea level rise and increased in extreme weather, can indirectly impact human health, neither the EPA nor CARB has established ambient air quality standards for GHG emissions. The state's GHG reduction strategy outlines a path to avoid the most catastrophic effects of climate change. Yet the state's GHG reduction goals and strategies are based on the state's path toward reducing statewide cumulative GHGs as outlined in AB 32, SB 32, and Executive Order S-03-05.

As above, the two significance thresholds that the City uses to analyze GHG impacts are based on achieving the statewide GHG reduction goals (GHG-1) and relying on consistency with policies or plans adopted to reduce GHG emissions (GHG-2). Further, because no single project is large enough to result in a measurable increase in global concentration of GHG emissions, climate change impacts of a project are considered on a cumulative basis. Without federal ambient air quality standards for GHG emissions and given the cumulative nature of GHG emissions and the City's significance thresholds that are tied to reducing the state's cumulative GHG emissions, it is not feasible at this time to connect the project's specific GHG emission to the potential health impacts of climate change.

5.7.4 Regulatory Requirements and General Plan Policies

5.7.4.1 REGULATORY REQUIREMENTS (RR)

RR GHG-1 New buildings are required to achieve the current California Building Energy and Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2019 Building and Energy Efficiency Standards were effective on January 1, 2020. The Building Energy and Efficiency Standards and CALGreen are updated tri-annually.

RR GHG-2 Construction activities are required to adhere to California Code of Regulations, Title 13, Section 2499, which restricts nonessential idling of construction equipment to five minutes or less.

RR GHG-3 New buildings are required to adhere to the California Green Building Standards Code and Water Efficient Landscape Ordinance requirements to increase water efficiency and reduce urban per capita water demand.

RR GHG-3 CARB's Renewable Portfolio Standard (RPS) is a foundational element of the state's emissions reduction plan. These mandates apply directly to investor-owned utilities, which in the case of the General Plan Update is Southern California Edison. The RPS targets are 50 percent renewable resources target by December 31, 2026, and 60 percent target by December 31, 2030. SB 100 also requires that retail sellers and local, publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024; 52 percent by December 31, 2027; and 60 percent by December 31, 2030.

RR GHG-4 The Low Carbon Fuel Standard for transportation fuels requires that California's transportation fuels reduce their carbon intensity by at least 10 percent by 2020.

RR GHG-5 The 2007 Energy Bill creates new federal requirements for increases in fleetwide fuel economy for passenger vehicles and light trucks under the federal Corporate Average Fuel Economy standards. The federal legislation requires a fleetwide average of 35 miles per gallon to be achieved by 2020. The National Highway Traffic Safety Administration is directed to phase in requirements to achieve this goal. Analysis by CARB suggests that this will require an annual improvement of approximately 3.4 percent between 2008 and 2020.

RR GHG-6 Assembly Bill 1493 (Pavley) required CARB to develop and adopt regulations designed to reduce greenhouse gases emitted by passenger vehicles and light-duty trucks beginning with the 2009 model year. The standards set within the Pavley regulations reduced GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016.

RR GHG-7 California's Green Building Standards Code (CALGreen) requires the recycling and/or salvaging for reuse at minimum of 65 percent of the nonhazardous construction and

demolition waste generated during most "new construction" projects (CALGreen §§ 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project, or salvaged for future use or sale and the amount (by weight or volume).

5.7.4.2 GENERAL PLAN UPDATE POLICIES

The following are relevant policies of the Santa Ana General Plan Update that may reduce potential GHG impacts.

~~Circulation~~ Mobility Element

- **Policy 1.7 Proactive Mitigation.** Proactively mitigate potential air quality, noise, congestion, safety, and other impacts from the transportation network on residents and business.
- **Policy 1.8 Environmental Sustainability.** Consider air and water quality, noise reduction, neighborhood character, and street-level aesthetics when making improvements to travelways.
- **Policy 3.3 Safe Routes to School.** Lead the development and implementation of safer routes to school by partnering with the school district, residents, property owners, and community stakeholders.
- **Policy 3.4 Regional Coordination.** Coordinate development of the City's active transportation and transit network with adjacent jurisdictions, OCTA, and other appropriate agencies.
- **Policy 3.5 Education and Encouragement.** Encourage active transportation choices through education, special events, and programs.
- **Policy 3.7 Complete Streets Design.** Enhance streets to facilitate safe walking, bicycling, and other nonmotorized forms of transportation through community participatory design.
- **Policy 4.1 Intense Development Areas.** Program multimodal transportation and public realm improvements that support new development in areas along transit corridors and areas planned for high intensity development.
- **Policy 4.2 Project Review.** Encourage active transportation, transit use, and connectivity through physical improvements and public realm amenities identified during the City's Development Review process.
- **Policy 4.3 Transportation Management.** Coordinate with OCTA, employers, and developers to utilize TDM (transportation demand management) strategies and education to reduce vehicle trips and parking demands.
- **Policy 4.5 Land Use Development Design.** Ensure that building placement ~~the placement of buildings,~~ and design features~~, and street environment~~ create a desirable and active streetscape.

- **Policy 4.6 Roadway Capacity Alternatives.** Promote reductions in automobile trips and vehicle miles traveled by encouraging transit use and nonmotorized transportation as alternatives to augmenting roadway capacity.

- **Policy 4.7 Parking.** Explore and implement a flexible menu of parking options and other strategies to efficiently coordinate the response to parking demands

- **Policy 4.9 Air Pollution Mitigation.** Consider land use, building, site planning, and technology solutions to mitigate exposure to transportation related air pollution.

- **Policy 5.4 Green Streets.** Leverage opportunities along streets and public rights-of-way to improve water quality through use of landscaping, permeable pavement, and other best management practices.

- **Policy 5.6 Clean Fuels and Vehicles.** Encourage the use of alternative fuel vehicles and mobility technologies through the installation of supporting infrastructure.

- ~~**Policy 5.9 Street Trees.** Support the greening of City streets through the establishment and maintenance of an urban forest to improve street aesthetics, filter pollution, and address GHG emissions.~~

Community Element

- **Policy 3.2 Healthy Neighborhoods.** Continue to support the creation of healthy neighborhoods by addressing public safety, ~~mitigating~~ land use conflicts, hazardous soil contamination, incompatible uses, and maintaining building code standards.

- **Policy 3.4 Safe Mobility.** Promote the overall safety of multi-modal streets by developing local and regional programs that educate and inform motorists of non-motorized roadway users.

- **Policy 3.7 Active Lifestyles.** Support programs that ~~create safe routes to schools and other destinations to~~ promote sports, fitness, walking, biking and active lifestyles.

Conservation Element

- **Policy 1.1 Regional Planning Efforts.** Coordinate air quality planning efforts with local and regional agencies to meet State and Federal ambient air quality standards in order to protect all residents from the health effects of air pollution.

- **Policy 1.2 Climate Action Plan.** Consistency with emission reduction goals highlighted in the Climate Action Plan shall be considered in all major decisions on land use and investments in public infrastructure.

- **Policy 1.3 Education.** Promote efforts to educate businesses and the general public about air quality standards, reducing the urban heat island effect, health effects from poor air quality and extreme heat, and best practices they can make to improve air quality and reduce greenhouse gas emissions.

- **Policy 1.4 Development Standards.** Support new development that meets or exceeds standards for energy-efficient building design and site planning.

- **Policy 1.5 Sensitive Receptor Decisions.** Consider potential impacts of stationary and non-stationary emission sources on existing and proposed sensitive uses and opportunities to minimize health and safety risks. Develop and adopt new regulations on the siting of facilities that might significantly increase pollution near sensitive receptors within environmental justice area boundaries. ~~Mitigate or apply special considerations and regulations on the siting of facilities that might significantly increase pollution near sensitive receptors within environmental justice area boundaries.~~

- **Policy 1.6 New and Infill Residential Development.** Promote development that is mixed-use, pedestrian-friendly, transit oriented, and clustered around activity centers.

- **Policy 1.7 Housing and Employment Opportunities.** Improve the City's jobs/housing balance ratio by supporting development that provides housing and employment opportunities to enable people to live and work in Santa Ana.

- **Policy 1.8 Promote Alternative Transportation.** Promote use of alternate modes of transportation in the City of Santa Ana, including pedestrian, bicycling, public transportation, car sharing programs and emerging technologies.

- **Policy 1.9 Public Investment Alternative Transportation Infrastructure.** Continue to invest in infrastructure projects that support public transportation and alternate modes of transportation in the City of Santa Ana, including pedestrian, bicycling, public transportation, car sharing programs, and emerging technologies.

- **Policy 1.10 Transportation Management.** Continue to support and invest in improvements to the City's Transportation Management System, including projects or programs that improve traffic flow and reduce traffic congestion.

- **Policy 1.11 Public Investment in Low- or Zero Emission Vehicles.** Continue to invest in low-emission or zero-emission vehicles to replace the City's gasoline powered vehicle fleet and to transition to available clean fuel sources such as bio-diesel for trucks and heavy equipment.

- **Policy 1.12 Sustainable Infrastructure.** Encourage the use of low or zero emission vehicles, bicycles, non-motorized vehicles, and car-sharing programs by supporting new and existing development that includes sustainable infrastructure and strategies such as vehicle charging stations, drop-off areas for ride-sharing services, secure bicycle parking, and transportation demand management programs.

- **Policy 1.13 City Contract Practices.** Support businesses and contractors that use reduced-emissions equipment for city construction projects and contracts for services, as well as businesses that practice sustainable operations.

- **Policy 1.14 Transportation Demand Management.** Require and incentivize projects to incorporate Transportation Demand Management (TDM) techniques.
- **Policy 2.3 Resource Management**. Efficiently manage soil and mineral resource operations to eliminate significant nuisances, hazards, or adverse environmental effects on neighboring land uses.
- **Policy 3.1 Interagency Coordination.** Consult with regional agencies and utility companies to pursue energy efficiency goals and expand renewable energy strategies.
- **Policy 3.2 Education Programs.** Support education programs to provide information on energy conservation and alternatives to non-renewable energy sources.
- **Policy 3.3 Development Patterns**. Promote energy efficient-development patterns by clustering mixed use developments and compatible uses adjacent to public transportation.
- **Policy 3.4 Site Design.** Encourage site planning and subdivision design that incorporates the use of renewable energy systems.
- **Policy 3.5 Landscaping.** ~~Encourage~~ Promote and encourage the planting of native and diverse tree species to improve air quality, reduce heat island effect, reduce energy consumption, and contribute to carbon mitigation with special focus in environmental justice areas.
- **Policy 3.6 Life Cycle Costs.** Encourage construction and building development practices that use renewable resources and life cycle costing in construction and operating decisions.
- **Policy 3.7 Energy Conservation Design and Construction.** Incorporate energy conservation features in the design of new construction and rehabilitation projects.
- **Policy 3.8 Energy-Efficient Public Facilities.** Promote and encourage efficient use of energy and the conservation of available resources in the design, construction, maintenance, and operation of public facilities, infrastructure, and equipment.
- **Policy 3.9 Energy Generation in Public Facilities.** Encourage and support the generation, transmission, use, and storage of locally-distributed renewable energy in order to promote energy independence, efficiency, and sustainability.
- **Policy 3.10 Energy Conservation in Public Projects.** Work with businesses and contractors that use energy-efficient practices in the provision of services and equipment for city construction projects.
- **Policy 3.11 Energy-Efficient Transportation Infrastructure.** Continue to support public and private infrastructure for public transportation such as bus routes, rail lines, and the OC Streetcar.
- **Policy 4.1 Water Use.** Encourage and educate residents, business owners, and operators of public facilities to use water wisely and efficiently.

- **Policy 4.2 Landscaping.** Encourage public and private property owners to plant native or drought-tolerant vegetation.
- **Policy 4.3 Recycled Water Systems.** Continue to coordinate with the Orange County Water District, Orange County Sanitation District, and developers for opportunities to expand use of reclaimed water systems.
- **Policy 4.4 Irrigation Systems.** Promote irrigation and rainwater capture systems that conserve water to support a sustainable community.
- **Policy 4.5 Water Supply.** Continue to collaborate with Orange County Water District and Metropolitan Water District to ensure reliable, adequate, and high quality sources of water supply at a reasonable cost.
- **Policy 4.6 Water Quality.** Work with public and private property owners to reduce storm water runoff and to protect the water quality percolating into the aquifer and into any established waterway.

Economic Prosperity Element

- **Policy 2.9 Energy Conservation.** Collaborate with utility providers and regional partners to encourage business and industry to improve performance in energy efficiency, water conservation, and waste reduction.
- **Policy 2.10 Green Business.** Support the growth of a diverse green business sector that facilitates and promotes environmental sustainability and creates a competitive advantage for business attraction activities.

Land Use Element

- **Policy 1.5 Diverse Housing Types.** Incentivize quality infill residential development that provides a diversity of housing types and accommodates all income levels and age groups.
- **Policy 1.6 Transit Oriented Development.** Encourage residential mixed-use development, within the City's District Centers and Urban Neighborhoods, and adjacent to high quality transit.
- **Policy 1.7 Active Transportation Infrastructure.** Invest in active transportation connectivity between activity centers and residential neighborhoods to encourage healthy lifestyles.
- **Policy 2.5 Benefits of Mixed Use.** Encourage infill mixed-use development at all ranges of affordability to reduce vehicle miles travelled, improve jobs/housing balance, and promote social interaction.
- **Policy 2.10 Smart Growth.** Focus high density residential in mixed-use villages, designated planning focus areas, Downtown Santa Ana, and along major travel corridors.
- **Policy 3.8 Sensitive Receptors.** Avoid the development of industry and sensitive receptors in close proximity to ~~land uses~~ each other that could pose a hazard to human health and safety, due to the quantity,

concentration, or physical or chemical characteristics of the hazardous materials ~~that they utilize~~utilized, or the hazardous waste ~~that they~~ an operation may generate or emit.

- **Policy 3.9 ~~Improving Health~~ Noxious, Hazardous, Dangerous, and Polluting Uses.** Improve the health of residents, students, and workers by limiting the impacts of construction activities and ~~by discontinuing the~~ operation of noxious, hazardous, dangerous, and polluting uses that are in close proximity to sensitive receptors, with priority given to discontinuing such uses within environmental justice areas boundaries.

- **Policy 4.1 Complementary Uses.** Promote complete neighborhoods by encouraging a mix of complementary uses, community services, and people places within a walkable area.

- **Policy 4.3 Sustainable Land Use Strategies.** Encourage land uses and strategies that reduce energy and water consumption, waste and noise generation, soil contamination, air quality impacts, and light pollution.

- **Policy 4.4 Natural Resource Capture.** Encourage the use of natural processes to capture rainwater runoff, sustainable electric power, and passive climate control.

- **Policy 4.5 VMT Reduction.** Concentrate development along high-quality transit corridors to reduce vehicle miles traveled (VMT) and transportation related carbon emissions.

Open Space Element

- ~~**Policy 1.6 Sustainable Landscape.** Promote citywide use of drought tolerant landscape and development practices for wise water use and energy consumption.~~

- **Policy 3.7 Urban Forest.** Maintain, preserve, and enhance the City's urban forest as an environmental, economic, and aesthetic resource to improve residents' quality of life.

Public Services Element

- **Policy 1.7 Sustainable and Resilient Practices.** Require ~~Use sustainable and energy efficient building and maintenance practices as part of~~ the development or rehabilitation of any public facility or capital improvement to incorporate site design and building practices that promote sustainability, energy efficiency, and resiliency.
- **Policy 3.2 Wastewater Service.** Provide and maintain wastewater collection facilities which adequately serve existing land uses and future development projects while maximizing cost efficiency.

- **Policy 3.3 Wastewater Technology.** Explore new technologies that treat and process wastewater that reduce overall capacity needs of centralized wastewater systems.

- **Policy 3.4 Drainage Facilities.** Expand and maintain storm drain facilities to accommodate the needs of existing and planned development.

- **Policy 3.5 Green Infrastructure.** Incorporate sustainable design and Low Impact Development (LID) techniques for storm water facilities and new development to achieve multiple benefits, including enhancing preserving and creating open space and habitat, reducing flooding, and improving runoff water quality.
- **Policy 3.6 Water Service**. Provide water quality and service that meets or exceeds State and Federal drinking water standards.
- **Policy 3.7 Emergency Connections.** Maintain emergency connections with local and regional water suppliers in the event of delivery disruption.
- **Policy 3.8 Conservation Strategies.** ~~Implement~~ Promote cost effective conservation strategies and programs that increase water use efficiency.
- **Policy 3.9 Household Recycling.** Expand household recycling services and educational awareness programs.
- **Policy 3.10 Development Projects.** Encourage new development and reuse projects to incorporate recycling and organics collection activities aligned with state waste reduction goals.
- **Policy 3.11 Waste Collection.** Support infill development projects that provide adequate and creative solutions for waste and recycling collection activities.
- **Policy 3.12 Sewer and Water.** Maintain and upgrade sewer and water infrastructure through impact fees from new development and exploring other funding sources.

Safety Element

- **Policy 2.1 Regional Collaboration.** Consult and collaborate with federal, state, and regional agencies to identify and regulate the disposal and storage of hazardous materials, ~~and~~ prevent the illegal transportation and disposal of hazardous waste, ~~facilitate the cleanup of contaminated sites,~~ and facilitate the cleanup of contaminated sites.
- **Policy 2.2 Hazardous Waste Generators.** Collaborate with appropriate agencies to identify and inventory all users and handlers of hazardous materials to proactively mitigate potential impacts.
- **Policy 2.3 Transportation and Storage.** Coordinate with the County of Orange, the California Department of Transportation, and other relevant parties to enforce state and local laws regulating the storage and transport of hazardous materials within the City of Santa Ana, and limit truck routes through the City to arterials streets away from natural habitats and sensitive land uses.
- **Policy 2.4 Planning and Remediation.** Determine the presence of hazardous materials and/or waste contamination prior to approval of new uses and require that appropriate measures be taken to protect the health and safety of site users and the community.

- **Policy 2.6 Existing Sensitive Uses.** Partner and collaborate with property owners, businesses, and community groups to develop strategies to protect and minimize risks from existing hazardous material sites to existing nearby sensitive uses with priority given to discontinuing such uses within environmental justice area boundaries.

Urban Design Element

- **Policy 1.6 Active Transportation Infrastructure.** Support the creation of citywide public street and site amenities that accommodate and promote an active transportation-friendly environment.
- **Policy 2.10 Greening the Built Environment.** Promote planting of shade trees and require, where feasible, preservation and site design that uses appropriate tree species to shade parking lots, streets, and other facilities with the goal of reducing the heat island effect.
- **Policy 2.11 Sustainable Practices.** Encourage sustainable development through the use of drought tolerant landscaping, permeable hardscape surfaces, and energy efficient building design and construction.
- **Policy 3.10 Coordinated Street Improvement Plans.** Coordinate citywide landscape medians and street trees with land use plans and development projects.
- **Policy 5.4 Intersections for all Travel Modes.** Strengthen active transportation connections and amenities at focal intersections to promote a pleasant and safe experience for non-motorized forms of travel.

5.7.5 Environmental Impacts

5.7.5.1 METHODOLOGY

This GHG evaluation was prepared in accordance with the requirements of CEQA to determine if significant GHG impacts are likely to occur in conjunction with future development that would be accommodated by the General Plan Update. The City's GHG emissions inventory includes the following sectors:

- **Transportation.** Transportation emissions forecasts were modeled using emissions data from CARB's EMFAC2017, version 1.0.7, web database. Additionally, the SAFE Vehicle Part One Rule and Final SAFE Rule adjustment factor for CO_2 were applied for light duty vehicles (i.e., LDA, LDT1, LDT2, and MDV) per CARB guidance for year 2045 emissions (CARB 2020). Model runs were based on daily per-capita VMT data provided by IBI Group (see Volume IV, Appendix K) and calendar year 2020 (existing) and 2045 emission rates.[5] The VMT utilized is based on the origin-destination approach and assumes the full trip length for vehicle trips that occur entirely within the city (i.e., internal-internal trips). For external-

[5] The Year 2045 inventory represents the projected emissions that the existing land uses would generate in the future, using year 2045 emission factors for on-road vehicles. To isolate the impacts related to the change in land uses proposed under the General Plan update, emissions related to the update will be based on the difference in emissions generated by the existing and proposed land uses under year 2045 conditions. This approach is taken because existing land uses would be subject to regulations that come into effect in the future that reduce mobile-source emissions. Thus, the level of emissions the existing land uses generate today would not be generated in perpetuity, but would be affected by these state regulations.

internal/internal-external trips, the trip lengths are based on the destinations/attractions near the boundary assumed in the Orange County Transportation Authority traffic model in addition to the likely attractions/destinations beyond the immediate developments near the boundary limit.

- **Energy.** Emissions associated with natural gas use for residential and nonresidential land uses in the city were modeled based on data provided by SCE for years 2012 through 2018 and by SoCalGas for years 2014 to 2018. Forecasts are adjusted for increases in population and employment in the city.

- **Off-Road Equipment.** Calendar year 2020 emission rates for Orange County obtained from CARB's OFFROAD2017, version 1.0.1, web database were used to estimate criteria air pollutant emissions from light commercial and construction equipment in the City. OFFROAD2017 is a database of equipment use and associated emissions for each county compiled by CARB. In order to determine the percentage of emissions attributable to the city, light commercial equipment is estimated based on employment for Santa Ana as a percentage of Orange County. Construction equipment use is estimated based on building permit data for Santa Ana and County of Orange from data compiled by the US Census. The light commercial equipment emissions forecast is adjusted for changes in employment in the city. It is assumed that construction emissions for the forecast year would be similar to historical levels. Annual emissions are derived by multiplying daily emissions by 365 days.

- **Water/Wastewater.** GHG emissions from this sector include indirect GHG emissions from the embodied energy associated with water use and wastewater generation and fugitive GHG emissions from processing wastewater. The total annual existing and horizon year proposed project water demand and wastewater generation (gallons per year) in the city are based on average daily rates (gallons per day) estimated by Fuscoe Engineering and multiplied by 365 days. Electricity use from water use is estimated using energy rates identified by the CEC (CEC 2006b). Then energy is multiplied by the carbon intensity of energy. Wastewater treatment also results in fugitive GHG emissions from wastewater processing. Fugitive emissions from wastewater treatment in the city were calculated using the emission factor's in CARB's LGOP, Version 1.1.

- **Solid Waste Disposal.** GHG emissions from solid waste disposed of by residents and employees in the city were quantified based on the waste-in-place method. This method assumes that the degradable organic component in waste decays slowly throughout a few decades, during which CH_4 and biogenic CO_2 are formed. If conditions are constant, the rate of CH_4 production depends solely on the amount of carbon remaining in the waste. As a result, emissions of CH_4 from waste deposited in a disposal site are highest in the first few years, then gradually decline. Significant CH_4 production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Waste disposal was averaged over several years to account for fluctuations in average annual solid waste disposal. Waste generated was averaged over a three-year period (2015-2017) based on data obtained from the California Department of Resources Recycling and Recovery (CalRecycle), to provide an estimate of GHG emissions for existing conditions (baseline year). GHG emissions from solid waste disposal in the baseline year were modeled using CARB's Landfill Emissions Tool, version 1.3, which includes waste characterization data from CalRecycle. Because the landfill gas captured is not under the jurisdiction of the City of Santa Ana, the landfill gas emissions from the capture system are not included in the inventory. Only fugitive sources of

GHG emissions from landfills are included. Modeling assumes a 75 percent reduction in fugitive GHG emissions from the landfill gas capture system. The landfill gas capture efficiency is based on CARB's LGOP, version 1.1. Emissions were adjusted to the AR5 GWP assigned for CH_4. Total GHG emissions from waste disposal in 2045 were forecast based on the percent increase in service population for the city. The emissions forecast does not account for reductions from increasing waste diversion.

Industrial sources of emissions that require a permit from South Coast AQMD are not included in the community inventory. However, due to the 15/15 Rule, natural gas and electricity use data for industrial land uses may also be aggregated with the nonresidential land uses in the data provided by SCE.[6] Life-cycle emissions are not included in this analysis because not enough information is available for the proposed General Plan Update; and therefore, they would be speculative. Black carbon emissions are not included in the GHG analysis because CARB does not include this pollutant in the State's GHG emissions inventory and treats this short-lived climate pollutant separately.[7].

5.7.5.2 IMPACT ANALYSIS

The following impact analysis addresses thresholds of significance for which the Notice of Preparation disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.7-1: Implementation of the proposed General Plan Update would result in a decrease in GHG emissions in horizon year 2045 from existing baseline but may not meet the long-term GHG reduction goal under Executive Order S-03-05. [Threshold GHG-1]

Development under the General Plan Update (GPU) would contribute to global climate change through direct and indirect emissions of GHG from land uses within the city. A general plan does not directly result in development without additional approvals. Before any development can occur in the city, it must be analyzed for consistency with the GPU, zoning requirements, and other applicable local and State requirements; comply with the requirements of CEQA; and obtain all necessary clearances and permits.

Horizon Year 2045 Emissions Forecast

Buildout of the proposed GPU is not linked to a specific development time frame but is assumed over a 25-year horizon. Implementation of the GPU by the horizon year of 2045 would result in a net increase of 96,855 residents and 11,436 employees in the city. Development that would be accommodated by the GPU would

[6] The 15/15 Rule was adopted by the California Public Utilities Commission in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 rule requires that any aggregated information provided by a utility must be made up of at least 15 customers, and a single customer's load must be less than 15 percent of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15 percent of the total data, categories must be combined before the information is released. The Rule further requires that if the 15/15 Rule is triggered for a second time after the data have been screened once already using the 15/15 Rule, the customer be dropped from the information provided.

[7] Particulate matter emissions, which include black carbon, are analyzed in Section 5.3, Air Quality. Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The State's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within ten years (CARB 2017a).

generate a net increase of 111,835 daily VMT at buildout (see Appendix K). The community GHG emissions inventory for the GPU at buildout compared to existing conditions is in Table 5.7-6, *GHG Emissions Forecast for GPU Horizon Year 2045*.

Table 5.7-6 GHG Emissions Forecast for GPU Horizon Year 2045

Category	GHG Emissions ($MTCO_2e$/Year)			
	Existing (2020)	General Plan 2045	Net Change	Percent Change
Transportation[1]	1,463,006	1,061,237	-401,769	-27%
Residential Energy[2]	208,050	303,797	95,747	46%
Non-Residential Energy[2]	432,202	463,292	31,090	7%
Solid Waste Disposal[3]	56,603	69,017	12,414	22%
Water/Wastewater[4]	34,084	41,688	7,604	22%
Off-Road Equipment[5]	18,678	17,713	-965	-5%
Total Community Emissions	**2,212,622**	**1,956,744**	**-255,878**	**-12%**
South Coast AQMD Bright Line Threshold	—	—	3,000	—
Exceeds the Bright-Line Threshold	—	—	**No**	—
Adjusted Service Population (SP)[6]	460,686	566,598	105,912	23%
$MTCO_2e$/SP	4.8	3.5	-1.3	-28%

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Fifth Assessment Report (AR5).

1 EMFAC2017 Version 1.0.2. Based on daily VMT provided by IBI Group. Transportation sector includes the full trip length for internal-internal trips and various trip lengths for external-internal/internal-external trips (see Appendix K). VMT per year based on a conversion of VMT x 347 days per year to account for less travel on weekend, consistent with CARB statewide GHG emissions inventory methodology (CARB 2008). The CARB adjustment factor to account for the SAFE Vehicle Rule Part One and the Final Safe Rule are incorporated for year 2045 emissions (CARB 2020).

2 Electricity usage is provided by SCE. Natural gas usage data provided by SoCalGas. The carbon intensity of the purchased electricity is based on SCE 2020 reported CO_2e intensity factor of 513 lbs/MWh (SCE 2019). For natural gas, the intensity factors for CO_2, CH_4, and NO_2 are from the LGOP, version 1.1 (CARB 2010).

3 Landfill Emissions Tool Version 1.3 and CalRecycle. Waste generation based on waste commitment for the City of Santa Ana obtained from CalRecycle and adjusted to account for solid waste associated with SOI. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's gas capture system. The landfill gas capture efficiency is based on CARB's Local Government Operations Protocol (LGOP), version 1.1. Significant CH_4 production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Therefore, the highest CH_4 emissions from waste disposal in a given year are reported.

4 LGOP, version 1.1, based on the water demand provided by Fuscoe Engineering. Wastewater usage is assumed to be 95% of water demand.

5 OFFROAD2017 Version 1.0.1. Light commercial equipment emissions estimated based on employment for the City of Santa Ana as a percentage of Orange County. Construction emissions estimated based on housing permit data for Orange County and the City of Santa Ana from the US Census. Area sources exclude emissions from fireplaces.

6 Service population (SP) consists of the aggregate of total employees and population within the study area. When aggregating employees and residents for transportation efficiency, an employee reduction factor was applied to account for overlaps in the two (employees who are also residents). Reduction factors were applied to both the City of Santa Ana employees then aggregated to the resident population. Reduction factors are based on employment data within the SCAG Local Profiles Reports (2019) for the City of Santa Ana. The SCAG reports show that 20.8 percent of employees within the City are also residents of the City (IBI 2020). Existing service population consists of 334,774 people and 158,980 employees within the City of Santa Ana. The 2045 projected service population consists of 431,629 and 170,416 employees within the City.

As shown in Table 5.7-6, buildout of the land uses accommodated under the General Plan Update would result in a net decrease of 255,878 $MTCO_2e$ of GHG emissions (12 percent decrease in GHG emissions) from existing conditions and would not exceed the 3,000 $MTCO_2e$ South Coast AQMD bright-line screening threshold. In addition, while buildout under the GPU is projected to increase adjusted service population by

105,912 persons (a 23 percent increase), emissions per person would decrease compared to existing baseline. Emissions per service population would decrease to 3.5 $MTCO_2e$/SP in horizon year 2045 from 4.8 $MTCO_2e$/SP for the existing baseline year. The primary reason for the decrease in overall community-wide GHG emissions, despite an increase in population and employment in the city, is a result of regulations adopted to reduce GHG emissions and turnover of California's on-road vehicle fleets.

Consistency with SB 32 and Executive Order S-03-05 GHG Reduction Targets

Though the proposed project would not generate an increase in GHG emissions from the CEQA baseline in the 2045 horizon year forecast, this EIR also analyzes the potential for the project to conflict with the GHG reduction goals established under SB 32 and Executive Order S-03-05, which require a reduction in statewide GHG emissions from existing conditions to a 40 percent reduction below 1990 levels in GHG emissions by 2030 and an 80 percent reduction by 2050. This updated Draft PEIR assumes that the CEQA baseline (2019 emissions) reflects the AB 32 goal in 2020. As a result, at the GPU horizon year of 2045, the city would need to reduce GHG emissions by 70 percent to ensure it is on a trajectory to achieve the long-term goal under Executive Order S-03-05.

As shown in Table 5.7-6 and as discussed, it is anticipated that implementation of the proposed General Plan Update would result in an overall net decrease in emissions in horizon year 2045 compared to existing baseline. However, GHG emissions reduction are only 12 percent less than the CEQA baseline and not the 70 percent necessary to ensure the city is on a trajectory to achieve the long-term year 2050 reduction goal of Executive Order S-03-05. Reduction strategies to meet the long-term 2050 GHG reduction goal in addition to establishment of a 2050 reduction target would be included in the planned future updates to the Climate Action Plan. Additionally, state strategies to achieve post-2030 targets would be necessary. Therefore, until such time, GHG emissions impacts for the proposed GPU are considered potentially significant in regard to meeting the long-term year 2050 reduction goal.

General Plan Policies That May Reduce GHG Emissions

While growth in the city would cumulatively contribute to GHG emissions impacts, implementation of the proposed GPU goals and policies could also help minimizing VMT and mobile-source emissions.

- **Conservation Element, Goal 1.** Protect air resources, improve regional and local air quality, and minimize the impacts of climate change (Policies 1.8 through 1.12 and Policy 1.14).
- **Land Use Element, Goal 1.** Provide a land use plan that improves quality of life and respects our existing community (Policies 1.6 and 1.7).
- **Land Use Element, Goal 2.** Provide a balance of land uses that meet Santa Ana's diverse needs (Policies 2.5 and 2.10).
- **Urban Design Element, Goal 1.** Improve the physical character and livability of the City to promote a sense of place, positive community image, and quality environment (Policy 1.6).

- **Urban Design Element, Goal 5.** Create focal points at major intersections to enhance community identity and open space (Policy 5.4).

For example, policies 1.8 through 1.10 of the conservation element focus on promoting alternative forms of transportation and investing in infrastructure for public and active transport. Policy 1.7 of the land use element and policies 1.6 and 5.4 of the urban design element would promote strengthening and development of active transportation connections.

While energy sector emissions would increase overall under the proposed GPU due to the forecast growth in population, it is anticipated that policies proposed under the GPU would contribute to reducing energy sector emissions through increasing energy efficiency, energy conservation, and use of renewable energy. For example, policy 1.12 of the conservation element encourages use of low emission modes of travel by supporting development of sustainable infrastructure. Policy 3.9 of the conservation element would encourage generation of renewable energy in public facilities to promote energy independence, efficiency, and sustainability. Policy 4.3 of the land use element, ~~policy 1.6 of the open space element,~~ policy 1.7 of the public service element, and policy 2.11 of the urban design element all encourage strategies to reduce consumption of resources, promote sustainable development building practices. Implementation of these policies, in addition to the other proposed policies of the GPU would contribute to minimizing GHG emissions associated with the city to the extent feasible. However even with the implementation of GPU policies, impacts would remain potentially significant.

Level of Significance Before Mitigation: While implementation of RR GHG-1 through RR GHG-7 and Conservation Policies 1.8, 1.9, 1.10, 1.12, 1.14, and 3.9; Land Use Policies 1.6, 1.7, 2.5, 2.10, and 4.3; ~~Open Space Policies 1.6,~~ Public Services Policy 1.7, Urban Design Policies 1.6,2.11, and 5.4 would contribute to the reduction of GHG emissions in the City, Impact 5.7-1 will be potentially significant.

Impact 5.7-2: The General Plan Update would not conflict with the plans adopted for the purpose of reducing GHG emissions. [Threshold GHG-2]

Applicable plans adopted for the purpose of reducing GHG emissions include CARB's Scoping Plan, SCAG's Connect SoCal Plan, and the City's Climate Action Plan. A consistency analysis with these plans is presented below.

CARB Scoping Plan

The CARB Scoping Plan is applicable to state agencies, but is not directly applicable to cities/counties and individual projects (i.e., the Scoping Plan does not require the City to adopt policies, programs, or regulations to reduce GHG emissions). However, new regulations adopted by the state agencies outlined in the Scoping Plan result in GHG emissions reductions at the local level. As a result, local jurisdictions benefit from reductions in transportation emissions rates, increases in water efficiency in the building and landscape codes, and other statewide actions that would affect a local jurisdiction's emissions inventory from the top down. Statewide strategies to reduce GHG emissions include the LCFS and changes in the corporate average fuel economy standards.

Project GHG emissions shown in Table 5.7-6 include reductions associated with statewide strategies that have been adopted since AB 32. Development projects accommodated under the General Plan Update are required to adhere to the programs and regulations identified by the Scoping Plan and implemented by State, regional, and local agencies to achieve the statewide GHG reduction goals of AB 32. Future development projects would be required to comply with these GHG emissions reduction measures because they are statewide strategies. For example, new buildings associated with land uses accommodated under the proposed land use plan of the GPU would be built to meet the CALGreen and Building Energy Efficiency Standards in effect at the time when applying for building permits. Furthermore, as discussed under Impact 5.7-1, the GPU includes policies that would help reduce GHG emissions and therefore help achieve GHG reduction goals. Therefore, overall, the General Plan Update would not obstruct implementation of the CARB Scoping Plan.

SCAG's Regional Transportation Plan/Sustainable Communities Strategy

SCAG adopted the Connect SoCal plan in May 2020. The Connect SoCal plan identifies that land use strategies that focus on new housing and job growth in areas rich with destinations and mobility options would be consistent with a land use development pattern that supports and complements the proposed transportation network. The overarching strategy in Connect SoCal is to provide for a plan that allows the southern California region to grow in more compact communities in transit priority areas and priority growth areas; provide neighborhoods with efficient and plentiful public transit; establish abundant and safe opportunities to walk, bike, and pursue other forms of active transportation; and preserve more of the region's remaining natural lands and farmlands (SCAG 2020b). The Connect SoCal plan contains transportation projects to help more efficiently distribute population, housing, and employment growth as well as projected development that is generally consistent with regional-level general plan data to promote active transport and reduce GHG emissions. The projected regional development, when integrated with the proposed regional transportation network identified in Connect SoCal, would reduce per capita vehicular travel-related GHG emissions and achieve the GHG reduction per capita targets for the SCAG region.

The GPU includes goals and policies that target transportation management and land use planning to develop energy efficient infrastructure that supports more public and active transport, thereby reducing VMT throughout the city. These goals and policies include those mentioned in Impact 5-7.1 as well as the following:

- **Conservation Element, Goal 3.** Reduce consumption of and reliance on non-renewable energy and support the development and use of renewable energy sources (Policies 3.3 and 3.11).

- **Land Use Element, Goal 4.** Support a sustainable Santa Ana through improvements to the built environment and a culture of collaboration (Policy 4.5).

Additionally, as demonstrated in Table 5.7-7, the GPU would be consistent with Connect SoCal goals. Furthermore, as discussed in Impact 5.13-1 of the *Population and Housing* section of this updated Draft PEIR, implementation of the GPU would improve and maintain the jobs-housing balance in the city. Thus, the GPU would make it easier for city residents to both live and work in the city instead of commuting to other areas, which would contribute to minimizing VMT. Therefore, the GPU would not interfere with SCAG's ability to implement the regional strategies in Connect SoCal, and no impact would occur.

Table 5.7-7 General Plan Update Consistency with SCAG's "Connect SoCal" Regional Transportation Plan / Sustainable Communities Strategy

SCAG Transportation—Sustainable Communities Strategy	Implementing Policies/Strategies	Consistency
Focus Growth Near Destinations and Mobility Options. The Connect SoCal Plan aims to create dynamic, connected built environments that support multimodal mobility, reduce reliance on single-occupancy vehicles, and reduce GHG emissions is critical throughout the region. Implementation of SCAG's recommended growth strategies will help Priority Growth Areas (PGAs) accommodate 64 percent of forecasted household growth and 74 percent of forecasted employment growth between 2016 and 2045.	Additional local policies to ensure growth near destinations and mobility options: • Emphasize land use patterns that facilitate multimodal access to work, educational and other destinations • Focus on a regional jobs/housing balance to reduce commute times and distances and expand job opportunities near transit and along center-focused main streets • Plan for growth near transit investments and support implementation of first/last mile strategies • Promote the redevelopment of underperforming retail developments and other outmoded nonresidential uses • Prioritize infill and redevelopment of underutilized land to accommodate new growth, increase amenities and connectivity in existing neighborhoods • Encourage design and transportation options that reduce the reliance on and number of solo car trips (this could include mixed uses or locating and orienting close to existing destinations) • Identify ways to "right size" parking requirements and promote alternative parking strategies (e.g. shared parking or smart parking)	**Consistent:** The GPU includes policies that would focus growth near destinations and mobility options. Policies 4.1, 4.2, 4.3 and 4.5 of the ~~circulation~~ mobility element would encourage new development in areas along transit corridors and areas planned for high intensity development. Policy 3.3 of the conservation element and policies 1.6, 2.5, 2.10, and 4.5 of the land use element would promote mixed use and infill developments near focus areas, major travel corridors, and public transportation options. These policies aim to reduce reliance on single-occupancy vehicles and reduce VMT while accommodating new growth in the city.
Promote Diverse Housing Choices. The Connect SoCal Plan notes that priority must be placed on urban and suburban infill, in existing/planned service areas and, for unincorporated county growth, within the planning boundary known as "Spheres of Influence" (SOI) where applicable and feasible. Growth at strategic nodes along key corridors, many of which are within HQTAs, will make transit a more convenient and viable option. In addition to new developments, production and preservation of permanent affordable housing to complement infill strategies is essential to achieving equitable outcomes.	Additional diverse housing strategies include: • Preserve and rehabilitate affordable housing and prevent displacement • Identify funding opportunities for new workforce and affordable housing development • Create incentives and reduce regulatory barriers for building context sensitive accessory dwelling units to increase housing supply • Provide support to local jurisdictions to streamline and lessen barriers to housing development that supports reduction of greenhouse gas emissions	**Consistent:** The GPU would strive to develop mixed use and infill projects that would offer diverse housing options for residents of all income levels (land use element, policies 1.6, 2.5, 2.10, 4.5). These policies include designated medium- to high-density residential areas in addition to mixed-use designated areas within focus areas, Downtown Santa Ana, and along major transit corridors. Furthermore, policy 3.1 of the conservation element, policy 1.7 of the land use element, and policies 1.6 and 5.4 of the urban design element all focus on supporting infrastructure for active and public transportation to provide mobility for residents and encourage alternative means of transit. These policies would cover improvements to active transportation connections and public transportation infrastructure for bus routes, rail lines, and streetcars.

Table 5.7-7 General Plan Update Consistency with SCAG's "Connect SoCal" Regional Transportation Plan / Sustainable Communities Strategy

SCAG Transportation—Sustainable Communities Strategy	Implementing Policies/Strategies	Consistency
Support Implementation of Sustainability Policies. Connect SoCal's conservation strategies consider the economic and ecological benefits of preserving natural areas and farmlands, while also maximizing their potential for GHG reduction. New housing and employment development is emphasized in PGAs such as Job Centers, Transit Priority Areas (TPAs), High Quality Transit Areas (HQTAs), and Neighborhood Mobility Areas (NMAs), and away from natural and farm lands on the edges of urban and suburban areas, to incentivize infill development and the concentration of varied land uses. This emphasis on concentrated, compact growth makes it easier to travel shorter distances, which reduces per-capita greenhouse gas emissions. In addition, natural areas and farmlands have the capacity to absorb and store atmospheric carbon dioxide, preventing additional contributions of GHG emissions.	Additional sustainable policies strategies include: • Pursue funding opportunities to support local sustainable development implementation projects that reduce greenhouse gas emissions • Support statewide legislation that reduces barriers to new construction and that incentivizes development near transit corridors and stations • Support local jurisdictions in the establishment of Enhanced Infrastructure Financing Districts (EIFDs), Community Revitalization and Investment Authorities (CRIAs), or other tax increment or value capture tools to finance sustainable infrastructure and development projects, including parks and open space • Work with local jurisdictions/communities to identify opportunities and assess barriers to implement sustainability strategies • Enhance partnerships with other planning organizations to promote resources and best practices in the SCAG region • Continue to support long range planning efforts by local jurisdictions • Provide educational opportunities to local decisions makers and staff on new tools, best practices and policies related to implementing the Sustainable Communities Strategy	**Consistent:** The GPU would implement policies that support sustainable practices for new developments and maintenance of the city. These policies would promote development of sustainable infrastructure for transportation (conservation element, policy 1.12), energy generation in public facilities (conservation element, policy 3.9), irrigation systems (conservation element, policy 4.4), and water facilities (public services element, policy 3.5). Policies from the ~~circulation~~ mobility element focus on sustainable practices in transportation (circulation element, policies 1.7, 1.8, 4.9, 5.4, and 5.6~~, and 5.9~~). Policies from the land use and urban design elements focus on encouraging sustainable land use strategies and practices, such as natural resource capture, sustainable electric power, and passive climate control (land use element, policies 4.3 and 4.4 and urban design element, policy 2.11). Policies 1.4, 3.3, 3.8, and 3.10 of the conservation element, policy 1.7 of the public services element, and policy 2.11 of the urban design element would all promote energy-efficient development patterns in building design, construction, and maintenance.

Source: SCAG 2020.

City of Santa Ana Climate Action Plan

Adopted by the City in December 2015, the CAP provides a comprehensive strategy for the reduction of GHG emissions to improve quality of life and promote economic prosperity throughout the city (Santa Ana 2015). Furthermore, the CAP provides measures to meet the goal of reducing community GHG emissions to a level 15 percent below 2008 emissions for 2020 and 30 percent below 2008 emissions by 2035 and reducing municipal emissions by 30 percent for 2020 and 40 percent by 2035. Cumulatively, the measures listed in the CAP are estimated to be 731,090 $MTCO_2e$/year by 2035. While these measures are not enough to meet the City's goal of 800,000 $MTCO_2e$/year, they serve as a foundation that can be built upon in later versions of the CAP to meet the 2035 goal. To ensure an effective and efficiency CAP, the City would modify measures based on their efficacy and add new measures based on future developments.

The GPU addresses improvements to transportation infrastructure and management to support alternate modes of transportation, including policies 3.4, 3.7, and 4.3 of the ~~circulation~~ mobility element and policies 1.8, 1.9, 1.10, 1.12, 1.14, and 3.11 of the conservation element. These policies would reduce impacts from transportation and would result in a reduction in VMT and GHG emissions in the City. In addition, policy 3.3 of the conservation element and policies 1.6, 2.5, 2.10, and 4.5 of the land use element would promote mixed use and infill developments near focus areas, major travel corridors, and public transportation options. These policies aim to reduce reliance on single-occupancy vehicles and reduce VMT while accommodating new growth in the City.

The GPU would also implement policies that support sustainable practices for new developments and maintenance of the city. These policies would promote development of sustainable infrastructure for transportation (conservation element, policy 1.12), energy generation in public facilities (conservation element, policy 3.9), irrigation systems (conservation element, policy 4.4), and water facilities (public services element, policies 3.5 and 3.12). Policies from the ~~circulation~~ mobility element focus on sustainable practices in transportation (~~circulation~~ mobility element, policies 1.7, 1.8, 4.9, 5.4, and 5.6~~, and 5.9~~). Policies from the land use and urban design elements focus on encouraging sustainable land use strategies and practices, such as natural resource capture, sustainable electric power, and passive climate control (land use element, policies 4.3 and 4.4 and urban design element, policy 2.11). Policies 1.4, 3.3, 3.8, and 3.10 of the conservation element, policy 1.7 of the public services element, and policy 2.11 of the urban design element would all promote energy-efficient development patterns in building design, construction, and maintenance. These policies would encourage reduction in energy consumption as well as less reliance on nonrenewable energy and would support the development and use of renewable energy sources. Thus, implementation of the GPU would contribute to the reduction of GHG emissions throughout the city, as seen in Table 5.7-6, would not interfere with the goals and measures of the City's CAP, and no impact would occur.

Level of Significance Before Mitigation: Because implementation of RR GHG-1 through RR GHG-7 and ~~Circulation~~ Mobility Policies 1.7, 1.8, 3.4, 3.7, 4.3, 4.9, 5.4, and 5.6~~, and 5.9~~; Conservation Policies 1.4, 1.7, 1.8, 1.9, 1.10, 1.12, 1.14, 3.3, 3.8, 3.9, 3.10, 3.11, 4.4; Land Use Policies 1.6, 1.7, 2.5, 2.10, 4.3, 4.4, and 4.5; Open Space Policies ~~1.6~~ 3.7, Public Services Policies 1.7, 3.5, and 3.12, Urban Design Policy 2.11 would contribute to the reduction of GHG emissions in the City, Impact 5.7-2 will be less than significant.

5.7.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impact would be less than significant: 5.7-2.

Without mitigation, the following impact would be **potentially significant**:

- **Impact 5.7-1** Implementation of the proposed General Plan Update would result in a decrease in GHG emissions in horizon year 2045 from existing baseline but may not meet the long-term GHG reduction goal under Executive Order S-03-05.

5.7.7 Mitigation Measures

Impact 5.7-1

GHG-1 The City of Santa Ana shall update the Climate Action Plan (CAP) every five years to ensure the City is monitoring the plan's progress toward achieving the City's greenhouse gas (GHG) reduction target and to require amendment if the plan is not achieving the specified level. The update shall consider a trajectory consistent with the GHG emissions reduction goal established under Executive Order S-03-05 for year 2050 and the latest applicable statewide legislative GHG emission reduction that may be in effect at the time of the CAP update (e.g., Senate Bill 32 for year 2030). The CAP update shall include the following:

- GHG inventories of existing and forecast year GHG levels.
- Tools and strategies for reducing GHG emissions to ensure a trajectory with the long-term GHG reduction goal of Executive Order S-03-05.
- Plan implementation guidance that includes, at minimum, the following components consistent with the proposed CAP:
  - Administration and Staffing
  - Finance and Budgeting
  - Timelines for Measure Implementation
  - Community Outreach and Education
  - Monitoring, Reporting, and Adaptive Management
  - Tracking Tools

Furthermore, the following measures will be considered when the City updates the Climate Action Plan:

- Measures to protect the most vulnerable populations
- Measure to increase carbon sinks
- Standards for electric vehicle parking
- Standards for construction projects

5.7.8 Level of Significance After Mitigation

Impact 5.7-1

Implementation of Mitigation Measure GHG-1 would ensure that the City is tracking and monitoring the City's GHG emissions in order to chart a trajectory to achieve the long-term year 2050 GHG reduction goal set by Executive Order S-03-05. However, at this time, there is no plan past 2030 that achieves the long-term GHG reduction goal established under Executive Order S-03-05. As identified by the California Council on Science and Technology, the state cannot meet the 2050 goal without major advancements in technology (CCST 2012).

Advancement in technology in the future could provide additional reductions to allow the state and City to meet the 2050 goal; however, no additional statewide measures are currently available. Therefore, Impact 5.7-1 would be **significant and unavoidable**.

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