



5.7 Greenhouse Gas Emissions



5.7 GREENHOUSE GAS EMISSIONS

5.7.1 PURPOSE

This section identifies existing climate conditions, the current state of climate change science, and greenhouse gas (GHG) emissions sources within California and the Study Area and provides an analysis of potential impacts associated with implementation of the General Plan Update. Potential impacts are identified and mitigation measures to address potentially significant impacts are recommended, as necessary. Refer to Appendix D, Air Quality and Greenhouse Gas Emissions Data, for the assumptions and calculations used in this analysis.

5.7.2 EXISTING REGULATORY SETTING

FEDERAL

The Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of GHGs at 400 to 450 ppm, carbon dioxide equivalent (CO₂eq)¹ concentration, is required to keep global mean warming below 2 degrees Celsius (°C), which in turn is assumed to be necessary to avoid dangerous climate change.

To-date, no national standards have been established for nationwide GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. Various efforts have been promulgated at the Federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, requires the following, which would aid in the reduction of national GHG emissions:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation,

¹ Carbon Dioxide Equivalent (CO₂eq) – A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.



energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

U.S. Environmental Protection Agency Endangerment Finding. The U.S. Environmental Protection Agency's (EPA) authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, the EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs (CO₂, CH₄, N₂O, hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and sulfur hexafluoride [SF₆]) constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and the EPA's assessment of the scientific evidence that form the basis for the EPA's regulatory actions.

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

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

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

In August 2016, the EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and



all types and sizes of buses and work trucks. The final standards are expected to lower CO₂ emissions by approximately 1.1 billion metric tons and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program.

Clean Power Plan and New Source Performance Standards for Electric Generating Units. On October 23, 2015, the EPA published a final rule (effective December 22, 2015) establishing the carbon pollution emission guidelines for existing stationary sources: electric utility generating units (80 FR 64510–64660), also known as the Clean Power Plan. These guidelines prescribe how states must develop plans to reduce GHG emissions from existing fossil-fuel-fired electric generating units. The guidelines establish CO₂ emission performance rates representing the best system of emission reduction for two subcategories of existing fossil-fuel-fired electric generating units: (1) fossil-fuel-fired electric utility steam-generating units and (2) stationary combustion turbines. Concurrently, the EPA published a final rule (effective October 23, 2015) establishing standards of performance for GHG emissions from new, modified, and reconstructed stationary sources: electric utility generating units (80 FR 64661–65120). The rule prescribes CO₂ emission standards for newly constructed, modified, and reconstructed affected fossil-fuel-fired electric utility generating units. The U.S. Supreme Court stayed implementation of the Clean Power Plan pending resolution of several lawsuits. Additionally, in March 2017, President Trump directed the EPA Administrator to review the Clean Power Plan in order to determine whether it is consistent with current executive policies concerning GHG emissions, climate change, and energy.

Presidential Executive Order 13783. Presidential Executive Order 13783, Promoting Energy Independence and Economic Growth (March 28, 2017), orders all Federal agencies to apply cost-benefit analyses to regulations of GHG emissions and evaluations of the social cost of carbon, nitrous oxide, and methane.

STATE

Various Statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of GHG emissions are not yet fully understood, that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation would be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Executive Order S-1-07. Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of Statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs the California Air Resources Board (CARB) to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in Assembly Bill 32 (AB 32), which requires California to reduce GHG emissions to 1990 levels by 2020.



Executive Order S-3-05. Executive Order S-3-05 set forth a series of target dates by which Statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary would also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

Executive Order S-13-08. Executive Order S-13-08 seeks to enhance the State's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of the State's first climate adaptation strategy. This would result in consistent guidance from experts on how to address GHG emissions in the State of California.

Executive Order S-14-08. Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

Executive Order S-20-04. Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in State-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal. The initiative places the California Energy Commission (CEC) in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines and developing and refining building energy efficiency standards under Title 24 to meet this goal.

Executive Order S-21-09. Executive Order S-21-09, 33 percent Renewable Energy for California, directs CARB to adopt regulations to increase California's Renewable Portfolio Standard (RPS) to 33 percent by 2020. This builds upon Senate Bill 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and Senate Bill 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.



Executive Order B-30-15. This order added the interim target to reduce Statewide GHG emissions 40 percent below 1990 levels by 2030 and requires CARB to update its current AB 32 Scoping Plan to identify measures to meet the 2030 target.

Assembly Bill 32 (California Global Warming Solutions Act of 2006). California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on Statewide GHG emissions. AB 32 requires that Statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

Assembly Bill 1493. AB 1493 (also known as the Pavley Bill) requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHG emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of 13 CCR Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. When fully phased in, the near-term standards would result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term standards would result in a reduction of about 30 percent.

Assembly Bill 3018. AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC would develop a comprehensive approach to address California's emerging workforce needs associated with the emerging green economy. This bill would ignite the development of job training programs in the clean and green technology sectors.

Senate Bill 97. SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under the California Environmental Quality Act (CEQA). This bill directs the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA.



OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible. OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in CEQA Guidelines Section 15064.7 that would encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

The Natural Resources Agency adopted the CEQA Guidelines Amendments prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the CEQA Guidelines Amendments and filed them with the Secretary of State for inclusion in the CCR. The CEQA Guidelines Amendments became effective on March 18, 2010.

Senate Bill 375. SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires MPOs to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that integrates land use and transportation strategies in that MPOs regional transportation plan in order to achieve GHG emissions reductions targets. CARB, in consultation with MPOs, would provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets would be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets.

Senate Bills 1078 and 107. SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Senate Bill 1368. SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required the CEC to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

Senate Bill 32 (SB 32). Signed into law in September 2016, SB 32 codifies the 2030 GHG reduction target in Executive Order B-30-15 (40 percent below 1990 levels by 2030). The bill authorizes CARB to adopt an interim GHG emissions level target to be achieved by



2030. CARB also must adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG reductions.

CARB Scoping Plan

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap to achieve the California GHG reductions required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California would implement to reduce the projected 2020 "Business as Usual" (BAU) emissions to 1990 levels, as required by AB 32. These strategies are intended to reduce CO₂eq emissions by 174 million metric tons (MT). This reduction of 42 million MTCO₂eq, or almost 10 percent from 2002 to 2004 average emissions, would be required despite the population and economic growth forecasted through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as those expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. When CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

AB 32 requires CARB to update the Scoping Plan at least once every five years. CARB adopted the first major update to the Scoping Plan on May 22, 2014. The updated Scoping Plan summarizes recent science related to climate change, including anticipated impacts to California and the levels of GHG reduction necessary to likely avoid risking irreparable damage. It identifies the actions California has already taken to reduce GHG emissions and focuses on areas where further reductions could be achieved to help meet the 2020 target established by AB 32. The Scoping Plan update also looks beyond 2020 toward the 2050 goal, established in Executive Order S-3-05, and observes that "a mid-term statewide emission limit will ensure that the State stays on course to meet our long-term goal." The Scoping Plan update did not establish or propose any specific post-2020 goals, but identified such goals in water, waste, natural resources, clean energy, transportation, and land use.

On January 20, 2017, CARB released the proposed Second Update to the Scoping Plan, which identifies the State's post-2020 reduction strategy. The Second Update was approved on December 14, 2017 and reflects the 2030 target of a 40 percent reduction below 1990 levels, set by Executive Order B-30-15 and codified by SB 32.² The 2017 Scoping Plan establishes a new emissions limit of 260 million MTCO₂eq for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030. The 2017 Scoping Plan Update contains the following goals:

² California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, November 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf, accessed April 2, 2018.



1. SB 350
 - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
 - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard (LCFS)
 - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
 - Maintaining existing GHG standards for light- and heavy-duty vehicles.
 - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
 - Increase ZEV buses, delivery, and other trucks.
4. Sustainable Freight Action Plan
 - Improve freight system efficiency.
 - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
 - Deploy over 100,000 zero-emission trucks and equipment by 2030.
5. Short-Lived Climate Pollutant (SLCP) Reduction Strategy
 - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
 - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.
6. SB 375 Sustainable Communities Strategies
 - Increased stringency of 2035 targets.
7. Post-2020 Cap-and-Trade Program
 - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
 - CARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements.
8. 20 percent reduction in GHG emissions from the refinery sector.
9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.



California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission vehicle technologies; continued investment in renewables, including solar roofs, wind, and other 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 conservation of agricultural and other lands.

In addition to Statewide strategies, the 2017 Scoping Plan also identifies local governments as essential partners in achieving the State's long-term GHG reduction goals and identifies local actions to reduce GHG emissions. CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than six MTCO₂eq or less per capita by 2030 and 2 MTCO₂eq or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds - consistent with the Scoping Plan and the State's long-term GHG goals - and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or, a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate.

California Code of Regulations Title 24

In 1978, the CEC established Title 24, California's energy efficiency standards for residential and non-residential buildings, in response to a legislative mandate to create uniform building codes to reduce California's energy consumption and provide energy efficiency standards for residential and non-residential buildings. In 2013, the CEC updated Title 24 standards with more stringent requirements. The 2016 standards substantially reduce electricity and natural gas consumption. Additional savings result from the application of the standards on building alterations. For example, requirements for cool roofs, lighting, and air distribution ducts are expected to save additional electricity. These savings are cumulative, doubling as years go by. The 2016 standards have been approved and went into effect on January 1, 2017. California's energy efficiency standards are updated on an approximate three-year cycle.

The California Green Building Standards Code (CCR Title 24, Part 11), commonly referred to as the CALGreen Code, is a Statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the California Department of Housing and Community Development. CALGreen standards require new residential and commercial buildings to comply with mandatory measures under five topical areas: planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt which encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code was adopted in 2016 and went into effect January 1, 2017.



REGIONAL

South Coast Air Quality Management District

The SCAQMD adopted a *Policy on Global Warming and Stratospheric Ozone Depletion* in April 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of CFCs, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of HCFCs by the year 2000;
- Develop recycling regulations for HCFCs (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal.

The legislative and regulatory activity detailed above is expected to require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Southern California Association of Governments

The Southern California Association of Governments (SCAG) adopted the *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy (2016–2040 RTP/SCS)* on April 7, 2016. The 2016–2040 RTP/SCS reaffirms the land use policies that were incorporated into the 2012–2035 RTP/SCS. These foundational policies, which guided the development of the 2016–2040 RTP/SCS's strategies for land use, include the following:

- Identify regional strategic areas for infill and investment;
- Structure the plan on a three-tiered system of centers development;³
- Develop "Complete Communities";
- Develop nodes on a corridor;
- Plan for additional housing and jobs near transit;

3 Complete language: "Identify strategic centers based on a three-tiered system of existing, planned and potential relative to transportation infrastructure. This strategy more effectively integrates land use planning and transportation investment." A more detailed description of these strategies and policies can be found on pp. 90–92 of the *SCAG 2008 Regional Transportation Plan*, adopted in May 2008.



- Plan for changing demand in types of housing;
- Continue to protect stable, existing single-family areas;
- Ensure adequate access to open space and preservation of habitat; and
- Incorporate local input and feedback on future growth.

The 2016–2040 RTP/SCS recognizes that transportation investments and future land use patterns are inextricably linked, and continued recognition of this close relationship will help the region make choices that sustain existing resources and expand efficiency, mobility, and accessibility for people across the region. In particular, the 2016–2040 RTP/SCS draws a closer connection between where people live and work, and it offers a blueprint for how southern California can grow more sustainably. The 2016–2040 RTP/SCS also includes strategies focused on compact infill development and economic growth by building the infrastructure the region needs to promote the smooth flow of goods and easier access to jobs, services, educational facilities, healthcare and more.

The 2016–2040 RTP/SCS states that the SCAG region is home to about 18.3 million people in 2012 and currently includes approximately 5.9 million homes and 7.4 million jobs.⁴ By 2040, the integrated growth forecast projects that these figures will increase by 3.8 million people, with nearly 1.5 million more homes and 2.4 million more jobs. High Quality Transit Areas⁵ (HQTAs) will account for three percent of regional total land but are projected to accommodate 46 percent and 55 percent of future household and employment growth respectively between 2012 and 2040. The 2016–2040 RTP/SCS overall land use pattern reinforces the trend of focusing new housing and employment in the region's HQTAs. HQTAs are a cornerstone of land use planning best practice in the SCAG region because they concentrate roadway repair investments, leverage transit and active transportation investments, reduce regional life cycle infrastructure costs, improve accessibility, create local jobs, and have the potential to improve public health and housing affordability.

The 2016–2040 RTP/SCS is expected to reduce per capita transportation emissions by eight percent by 2020 and 18 percent by 2035. This level of reduction would meet the region's GHG targets set by CARB of eight percent per capita by 2020 and exceed the region's GHG target set by CARB of 13 percent per capita by 2035.⁶ Furthermore, although there are no per capita GHG emission reduction targets for passenger vehicles set by CARB for 2040, the 2016–2040 RTP/SCS's GHG emission reduction trajectory shows that more aggressive GHG emission reductions are projected for 2040.⁷ The 2016–2040 RTP/SCS would result in an estimated 21 percent decrease in per capita GHG emissions by 2040. By meeting and exceeding the SB 375 targets for 2020 and 2035, as well as achieving an approximately 21-percent decrease in per capita GHG emissions by 2040

4 2016-2040 RTP/SCS population growth forecast methodology includes data for years 2012, 2020, 2035 and 2040.

5 Defined by the 2016–2040 RTP/SCS as generally walkable transit villages or corridors that are within 0.5 mile of a well-serviced transit stop or a transit corridor with 15-minute or less service frequency during peak commute hours.

6 Southern California Association of Governments, *2016–2040 Regional Transportation Plan/Sustainable Communities Strategy, Executive Summary*, p. 8, April 2016.

7 Southern California Association of Governments, *Final Program Environmental Impact Report for 2016–2040, RTP/SCS*, Figure 3.8.4-1, April 2016.



(an additional three-percent reduction in the five years between 2035 [18 percent] and 2040 [21 percent]), the 2016–2040 RTP/SCS is expected to fulfill and exceed its portion of SB 375 compliance with respect to meeting the State’s GHG emission reduction goals.

LOCAL

Orange County

In 2011, the Orange County Transportation Authority (OCTA) and the Orange County Council of Governments (OCCOG) adopted the Orange County Sustainable Communities Strategy (OC SCS). The OC SCS is a subregional strategy created by a joint committee of representatives from the OCCOG and the OCTA called the OCCOG/OCTA Joint Working Committee. This Committee created a strategy to meet the requirements of SB 375 and the mutual agreements with SCAG with a plan to reduce GHGs that all local jurisdictions in Orange County could support.

SB 375 (Steinberg, Statutes of 2008) states that “a subregional council of governments and the county transportation commission may work together to propose the sustainable communities strategy (SCS) and an alternative planning strategy (APS) for that subregional area.” In addition, SB 375 authorizes that SCAG “may adopt a framework for a subregional SCS or a subregional APS to address the intraregional land use, transportation, economic, air quality, and climate policy relationships.”

The OC SCS includes technical data, best management practices, and local priorities - both land use and transportation oriented - that have an effect on vehicle transportation and its air quality outcomes. The OC SCS reflects the input of local jurisdictions, stakeholders, and the general public to profile Orange County’s existing commitment to future change in Countywide growth.

5.7.3 EXISTING ENVIRONMENTAL SETTING

The Study Area lies within the southern portion of the South Coast Air Basin (Basin). The Basin is a 10,743-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Geronio Pass area in Riverside County. The Basin’s terrain and geographical location (i.e., a coastal plain with connecting broad valleys and low hills) determine its distinctive climate.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. The climate is mild and tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area’s natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.



GLOBAL CLIMATE CHANGE GASES

The natural process through which heat is retained in the troposphere is called the “greenhouse effect.”⁸ The greenhouse effect traps heat in the troposphere through a threefold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and greenhouse gases (GHGs) in the upper atmosphere absorb this long wave radiation and then both emit some of this long wave radiation into space and re-radiate some toward the Earth. This “trapping” of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The most abundant GHGs are water vapor and carbon dioxide (CO₂). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation.

GHGs include, but are not limited to, the following:⁹

- Water Vapor (H₂O). Although H₂O has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the H₂O in our atmosphere, respectively. The primary human related source of H₂O comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of H₂O. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for H₂O.
- Carbon Dioxide (CO₂). CO₂ is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of CO₂ in the atmosphere has increased 43 percent.¹⁰ CO₂ is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.
- Methane (CH₄). CH₄ is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of CH₄ are landfills, natural gas systems, and enteric fermentation. CH₄ is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of CH₄ is 25.

8 The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

9 Intergovernmental Panel on Climate Change, *Climate Change, Climate Change 2007: Synthesis Report*. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.

10 U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2016*, April 2018.



- Nitrous Oxide (N₂O). N₂O is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N₂O is 298.
- Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 12 to 14,800.¹¹
- Perfluorocarbons (PFCs). PFCs are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. PFCs are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).¹² The GWP of PFCs range from 7,390 to 12,200.
- Sulfur hexafluoride (SF₆). SF₆ is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF₆ is the most potent GHG that has been evaluated by the IPCC with a GWP of 22,800. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to CO₂ (4 parts per trillion [ppt] in 1990 versus 365 ppm, respectively).¹³

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric O₃ depleters; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

- Hydrochlorofluorocarbons (HCFCs). HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 77 for HCFC-123 to 2,310 for HCFC-142b.¹⁴
- 1,1,1 trichloroethane. 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 146 times that of carbon dioxide.¹⁵

11 U.S. Environmental Protection Agency, *Overview of Greenhouse Gases*, <https://www3.epa.gov/climatechange/ghgemissions/gases/fgases.html>, accessed August 2, 2018.

12 Ibid.

13 Ibid.

14 U.S. Environmental Protection Agency, *Ozone-Depleting Substances Class II ODS*, <https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances#self>, accessed August 6, 2018.

¹⁵ Ibid.



- Chlorofluorocarbons (CFCs). CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the EPA Final Rule (57 FR 3374) for the phase out of O₃ depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with Global Warming Potentials ranging from 4,750 for CFC 11 to 14,420 for CFC 13.¹⁶

GHG EMISSIONS INVENTORY

United States GHG Emissions Inventory

The United States is the second largest emitter of GHG globally (behind China) and emitted approximately 6.5 billion metric tons of CO₂ equivalent (MTCO₂eq) in 2016, not including GHG absorbed by forests and agricultural land. The largest source of GHG in the United States (28.5 percent) comes from burning fossil fuels for transportation. Electrical power generation accounted for the second largest portion (28.4 percent) and industrial emissions accounted for the third largest portion (21.6 percent) of U.S. GHG emissions. The remaining 21.5 percent of U.S. GHG emissions were contributed by the agriculture, commercial, and residential sectors, plus emissions generated by U.S. Territories. Agriculture accounted for 9.4 percent of the U.S. emission, commercial accounted for 6.4 percent, and residential accounted for 5.1 percent with U.S. Territories accounting for 0.6 percent of emissions.

California GHG Emissions

In 2016, California emitted 429 million MTCO₂e of GHG, this puts total emissions just below the AB32 2020 target of 431 million metric tons. Emissions vary from year-to-year depending on the weather and other factors, but California will continue to implement its greenhouse gas reductions program to ensure the State remains on track to meet its climate targets in 2020 and beyond. These reductions come while California's economy grows and continues to generate jobs. According to the *California Greenhouse Gas Emission Inventory-2018 Edition* by the California Air Resources Board (CARB), transportation was the single largest source of the State's GHG emissions and accounted for 41 percent of the Statewide total. California's industrial sector generated 23 percent of the State's GHG total and electricity generation (including electricity generated out-of-State but used in California) was responsible for 16 percent of the GHG total. The agricultural sector at eight percent, residential sector at seven percent, and commercial sector at five percent accounted for the remaining GHG emissions.

GHG EMISSIONS SECTORS

Energy Consumption

Energy-related emissions are from the consumption of both electricity and natural gas. These emissions are both direct (e.g., building energy consumption) and indirect (e.g., produced off-site from energy production and water consumption [including water

¹⁶ Ibid.



treatment and delivery)). Energy consumption emissions were calculated using the California Emissions Estimator Model (CalEEMod) and the General Plan Update land use data. Electricity would be provided to the City via Southern California Edison (SCE). The emissions inventory used electricity and natural gas usage rates for residential, commercial, and industrial land uses for the existing year 2016 and the General Plan Update build-out year 2040; refer to [Appendix D, *Air Quality and Greenhouse Gas Emissions Data*](#), for the assumptions and calculations used in this analysis.

Transportation

The current version of the Orange County Congestion Management Program (CMP) was prepared by the Orange County Transportation Authority (OCTA) in October 2017. The goals of the CMP are to support regional mobility objectives by reducing traffic congestion; provide a mechanism to coordinate land use and development decisions that support the regional economy; and to determine gas tax fund eligibility. All freeways and selected arterial roadways in the County are designated elements of the CMP system of highways and roadways. OCTA has adopted a minimum Level of Service (LOS) threshold of LOS "E" for CMP facilities. Based on OCTA's *2016 Congestion Management Program*, there are no roadways within the City of Rancho Santa Margarita identified as CMP facilities.

The City's transportation sector generates Green House Gas (GHG) emissions. The California Air Pollution Control Officers Association (CAPCOA) publishes a resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures. According to the August 2010 publication *Quantifying Greenhouse Gas Mitigation Measures* the Land Use and Circulation Element's policies can be a means of reducing VMT. The CAPCOA report recognizes that land use planning provides the best opportunity to influence GHG emissions through a reduction in overall VMT. This is accomplished by reducing the distance people travel in combination with a substantial increase in local job opportunities. In addition to the land use based VMT reductions, further reductions (while limited) are possible by providing alternative transportation options.

While the CAPCOA report is primarily focused on the quantification of project-level mitigation measures, the VMT estimates for the City have been calculated using the Orange County Transportation Analysis Model version 3.4 (OCTAM 3.4); refer to [Appendix D](#) for the assumptions and calculations used in this analysis. This is possible since the traffic model calculates average trip lengths based on actual land use designations, characteristics and interactions. The VMT extracted from the model takes into account land use patterns and trip generation, as well as the distribution of these trips within the City and between the City and surrounding areas. It is also important to recognize that each vehicle trip has two ends, commonly referred to as an origin and a destination. Therefore, the calculation must divide the initial VMT estimate in half to account for the contribution of both ends of the trip. For trips internal to the City, the VMT attributable to both ends of the trip is accounted for. Trips that involve one trip-end outside the City are allocated 50 percent to the City and 50 percent to the other end of the trip. All shopping, recreational, social, and work-related trips contribute to the VMT estimates.



Solid Waste

Emissions from waste result primarily from organic waste occurring at landfills where the waste is disposed. Methane (CH₄) is the primary GHG from waste and the emissions result from chemical reactions and microbes acting upon the waste as the biodegradable materials break down. Solid waste generation and disposal data was calculated with CalEEMod defaults based off the City's land-uses, the existing year 2016, and the General Plan Update build-out year 2040; refer to [Appendix D](#) the assumptions used in this analysis.

Water and Wastewater

GHG emissions from water and wastewater result from the electricity used to extract, convey, treat, and distribute water, reported as kilowatt-hours per million gallons supplied by CEC. The City of Rancho Santa Margarita is served by two water districts, the Trabuco Canyon Water District (TCWD) and the Santa Margarita Water District (SMWD). The TCWD serves the eastern part of Rancho Santa Margarita (Robinson Ranch, Trabuco Highlands, Dove Canyon, Rancho Cielo, Walden Communities) and the Northeast Future Planned Community. The remaining portions of the incorporated City are served by SMWD. The TCWD provides potable water service to over 4,000 municipal connections in the County serving the cities of Rancho Santa Margarita, Lake Forest, and Mission Viejo, as well as Trabuco Canyon and other areas of unincorporated Orange County. TCWD's major facilities include the Robinson Ranch Reservoir, Dove Lake, and the Trabuco Creek Wells Facility which includes Rose Canyon Well and Lang Well. TCWD delivers potable water through its pressurized water system consisting of approximately 66 miles of pipelines. TCWD's water system is interconnected with adjacent agencies including SMWD and the Irvine Ranch Water District to provide reliability. SMWD provides over 50,000 municipal connections; SMWD's system consists of 1,525 miles of water (potable and recycled) and sewer lines, 31 potable water tank reservoirs, two emergency storage potable water reservoirs, seven recycled water tank reservoirs, and two open-air recycled water reservoirs. Nearly all of SMWD's water supply is purchased from MWD, which delivers water to the region from northern California via the SWP and from the Colorado River via the Colorado River Aqueduct.

TCWD has sewer collection facilities and acquired treatment capacity from SMWD for the western portion of the District. SMWD provides sewer service to portions of the cities of Rancho Santa Margarita, Mission Viejo, and San Clemente as well as unincorporated county areas within the District's sphere of influence. The water and wastewater usage for the existing year 2016 and the General Plan Update year 2040 were calculated using CalEEMod defaults for the City's land-uses; refer to [Appendix D](#) for the assumptions and calculations used in this analysis.

2016 GHG EMISSIONS INVENTORY

Table 5.7-1, Existing (2016) Rancho Santa Margarita GHG Emissions Inventory, presents the City's existing (2016) GHG emissions inventory for the different source categories in CalEEMod. As indicated in Table 5.7-1, the existing Citywide GHG emissions are 391,920 metric tons (MT) CO₂eq per year. On a per capita basis, the annual emissions in the City is 8.08 MTCO₂eq per year.



**Table 5.7-1
Existing (2016) Rancho Santa Margarita GHG Emissions Inventory**

Source Type/Category ²	CO ₂	CH ₄		N ₂ O		Total Metric Tons of CO ₂ eq ³
	Metric Tons/year ¹	Metric Tons/year ¹	Metric Tons of CO ₂ eq ²	Metric Tons/year ¹	Metric Tons of CO ₂ eq ²	
Area	5,812.97	5.93	148.25	0.13	38.74	5,999.26
Energy	76,796.58	2.74	68.50	0.85	253.3	77,117.27
Mobile	261,887.61	12.08	302	0.00	0.00	262,189.70
Waste	3,844.47	227.20	5680	0.00	0.00	9,524.52
Water	34,730.56	71.25	1781.25	1.94	578.12	37,089.80
Total for the City³	383,072.19	319.2	7980	2.92	870.16	391,920.55
Total Service Population Emissions⁴	8.08 MTCO₂eq/year/SP					
Notes:						
1. Emissions estimates calculated using CalEEMod version 2016.3.2.						
2. Emissions estimates calculated using the land use categories/intensities depicted in <u>Section 5.1, Land Use and Planning</u> .						
3. The numbers may be slightly off due to rounding.						
4. Based off the existing (2016) conditions population of 48,516.						
Source: Appendix D, <i>Air Quality and Greenhouse Gas Emissions Data</i> for assumptions used in this analysis.						

5.7.4 SIGNIFICANCE THRESHOLDS AND CRITERIA

The South Coast Air Quality Management District (SCAQMD) has adopted a significance threshold of 10,000 MTCO₂e per year for permitted (stationary) sources of GHG emissions for which SCAQMD is the designated lead agency. To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, SCAQMD convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting held in September 2010 (Meeting No. 15), SCAQMD suggested adoption of a tiered approach for evaluating GHG emissions for development projects where SCAQMD 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.

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, SCAQMD requires an assessment of GHG emissions. SCAQMD proposed a "bright-line" screening-level threshold of 3,000 MTCO₂eq annually for all land use types or the following land-use-specific thresholds: 1,400 MTCO₂eq for commercial projects, 3,500 MTCO₂eq for residential projects, or 3,000 MTCO₂eq for mixed-use projects. 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 3. If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.
- Tier 4. If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted. Tier 4 consists of 3 options to demonstrate that a project's GHG emissions are not significant:
 - Option 1: Reduce business as usual (BAU) emissions by 30 percent. Once GHG emissions are calculated, the applicant would need to incorporate design features and/or implement mitigation measures to demonstrate a 30 percent reduction.
 - Option 2: Early implementation of applicable AB 32 Scoping Plan Measures.
 - Option 3: Establish sector-based performance standards. The efficiency standard for projects is 3.0 MTCO₂eq per service population per year and the efficiency standard for plans is 4.1 MTCO₂eq per service population per year relative to a 2035 target date.
- Tier 5. Mitigation offsets to achieve target significance threshold.

Based on the Tier 4 Option 3 significance threshold of 4.1 MTCO₂eq per service population per year for plans, a significance threshold of 3.3 MTCO₂eq per service population per year relative to the 2040 General Plan buildout year¹⁷ was used to evaluate the project's GHG emissions. The analysis of this General Plan Update is based on qualitative thresholds of significance set forth below from Section VII of Appendix G to the CEQA Guidelines and compliance with applicable compliance regulations.

CEQA SIGNIFICANCE CRITERIA

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains the Initial Study Environmental Checklist, which includes questions relating to greenhouse gas emissions. The issues presented in the Initial Study Environmental Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may create a significant environmental impact if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

¹⁷ The 3.3 MTCO₂eq per service population per year significance threshold was derived by interpolating the annual reduction between the SCAQMD's 2020 (6.6 MTCO₂/yr) and 2035 (4.1 MTCO₂/yr) thresholds and forecasting this reduction to the year 2040:

- 6.6 MTCO₂eq/yr - 4.1 MTCO₂eq/yr = 2.5 MTCO₂eq/yr;
 - 2.5 MTCO₂eq/yr ÷ 15 years = 0.17 MTCO₂eq/yr;
 - 0.17 MTCO₂eq/yr x 5 years = 0.85 MTCO₂eq/yr;
 - 4.1 MTCO₂eq/yr - 0.85 MTCO₂eq/yr = 3.3 MTCO₂eq/yr.



5.7.5 PROJECT IMPACTS AND MITIGATION MEASURES

GREENHOUSE GAS EMISSIONS

- **IMPLEMENTATION OF THE GENERAL PLAN UPDATE COULD GENERATE GREENHOUSE GAS EMISSIONS, EITHER DIRECTLY OR INDIRECTLY, THAT MAY HAVE A SIGNIFICANT IMPACT ON THE ENVIRONMENT.**

Impact Analysis:

PROJECTED GREENHOUSE GAS EMISSIONS

Table 5.7-2, *Rancho Santa Margarita General Plan Update (2040) GHG Emissions Inventory*, presents the General Plan Update (2040) GHG emissions inventory for the different source categories in CalEEMod. As indicated in Table 5.7-2, the Citywide GHG emissions at General Plan year 2040 amount to approximately 334,480 MTCO₂eq per year. On a per capita basis, the annual emissions for each person in the City at 2040 is approximately 6.5 MTCO₂eq per year.

**Table 5.7-2
Rancho Santa Margarita General Plan Update (2040) GHG Emissions Inventory**

Source Type/Category ²	CO ₂	CH ₄		N ₂ O		Total Metric Tons of CO ₂ eq ³
	Metric Tons/year ¹	Metric Tons/year ¹	Metric Tons of CO ₂ eq ²	Metric Tons/year ¹	Metric Tons of CO ₂ eq ²	
Area	5,985.79	6.09	152.25	0.13	38.74	6,177.32
Energy	90,776.88	3.28	82.00	0.98	292.04	91,151.42
Mobile	184,990.25	6.69	167.25	0.00	0.00	185,157.54
Waste	4,441.15	262.46	6,561.50	0.00	0.00	11,002.77
Water	37,320.07	86.23	2,155.75	2.32	691.37	40,991.27
Total for the City³	324,338.68	364.76	9,119.00	3.43	1022.14	334,480.32
Total Service Population Emissions⁴	6.5 MTCO₂eq/year/SP					
SCAQMD GHG Threshold of Significance for plans	3.3 MTCO₂eq/year/SP					
Exceed SCAQMD GHG Threshold of Significance for plans?	Yes					
Notes:						
1. Emissions estimates calculated using CalEEMod version 2016.3.2.						
2. Emissions estimates calculated using the land use categories/intensities depicted in Section 5.1, <i>Land Use and Planning</i> .						
3. The numbers may be slightly off due to rounding.						
4. Service population is based off the anticipated 2040 population of 51,404, for the City of Rancho Santa Margarita.						
Source: Appendix D, <i>Air Quality and Greenhouse Gas Emissions Data</i> , for assumptions used in this analysis.						

The change in GHG emissions for year 2040 is based on the difference between existing developed land uses and developed land uses projected in the General Plan Update. The General Plan Update projects a relatively minor increase (1,692 persons) to the City's population by the year 2040; refer to Section 5.2, *Population, Housing, and Employment*. This GHG forecast is based on the construction of 528 additional dwelling units and 3,085,014 additional square feet of nonresidential land uses by 2040.



As depicted in Table 5.7-2, the majority of the GHG emissions from the General Plan Update will come from the mobile and energy sectors. The mobile emissions are predominantly due to the vehicle travel and trip length within the City, which is outside of the City's control. It is anticipated that California will have technological advancements¹⁸ in the transportation sector and lower-carbon fuels¹⁹ in the future; however, these reductions are not taken into account due to the unknown quantifiability of these future reductions. In terms of the energy sector emissions, Senate Bill 100 anticipates that by December 31, 2024, 40 percent of the energy provided by publicly owned electric utilities will come from renewable energy. This will continue to increase to 45 percent by December 31, 2027 and 50 percent by December 31, 2030. Although GHG reductions from the utilization of renewable energy are expected for the energy production within the City, these reductions were not considered in this analysis of the total energy sector GHG emissions due to their speculative nature.

As shown in Table 5.7-2, the City is estimated to generate 334,480 MTCO₂eq in the year 2040. Based on the anticipated population of 51,404 of the City in 2040, the City would have a GHG efficiency standard²⁰ of 6.5 MTCO₂eq per year per person in 2040 which is above the 3.3 MTCO₂eq per year per person efficiency standard for plans.

Land Use Element Policies 4.2 through 4.7 encourage the integration of transportation and land use planning to provide mobility options and comfort for pedestrians, bicyclists, transit users, and personal vehicles through adequate infrastructure and balanced allocation of space to promote alternative transportation options and increase recreational opportunities. Conservation/Open Space Element Policy 4.1 would require the City to cooperate with SCAQMD and SCAG to help reduce GHG emissions in the City to the maximum extent feasible. In addition, compliance with Conservation/Open Space Element Policy 7.1 and 7.2 would help the City reduce its GHG emissions through the implementation of Citywide GHG-reducing programs and projects, and by promoting sustainable development and resource conservation through education.

However, mobile emissions represent over half of the GHG emissions at General Plan year 2040 and its location limits the opportunity to significantly reduce mobile emissions, as Rancho Santa Margarita is not directly accessible to regional transit opportunities provided within the County. The City has limited control over mobile emissions beyond providing opportunities for development that would limit the need for vehicular trips and alternative, non-motorized transportation options, such as those encouraged through the proposed land use plan, including introduction of a mixed-use land use designation, and the above-mentioned policies. Mitigation Measure GHG-1 requires the City to implement an Energy Action Plan (EAP) which would identify opportunities to further reduce GHG emissions through a variety of energy-related programs and projects. However, GHG emissions reduction for the City is not anticipated to be below the 3.3 MTCO₂eq per year

18 California Air Resources Board, *California's Advanced Clean Cars Midterm Review*, January 18, 2017.

19 California Air Resources Board, *Low Carbon Fuel Standards*, <https://www.arb.ca.gov/fuels/lcfs/lcfs.htm> accessed August 20, 2018.

20 The efficiency standard is calculated by dividing annual MTCO₂eq emissions by service population.



per service population threshold. Therefore, the General Plan Update would have significant and unavoidable impact on GHG emissions.

Proposed General Plan Update Goals and Policies:

LAND USE ELEMENT

Goal 4: Integrate transportation and land use planning to provide mobility options and comfort for pedestrians, bicyclists, transit users, and personal vehicles.

Policy 4.2: Ensure that City rights-of-way provide adequate infrastructure for the movement of vehicles, bicycles, and pedestrians with facilities that provide safety and comfort for all transportation modes.

Policy 4.3: Balance street space allocated for alternative transportation options with parking when determining the appropriate future use of street space.

Policy 4.4: Support the creation of multiuse trails within the City and their connection to regional trails in order to provide enhanced access to open space, promote alternative transportation options, and increase recreational opportunities.

Policy 4.5: Support transit, bicycle, and pedestrian improvements that connect within the City and to neighboring jurisdictions.

Policy 4.6: Encourage nodes of interest and activity, public open spaces, well-planned development, mixed-use projects, and signature commercial uses that are highly accessible by pedestrians, bicyclists, and transit users.

CONSERVATION/OPEN SPACE ELEMENT

Goal 4: Cooperate with local and regional agencies to improve air quality.

Policy 4.1: Cooperate with the South Coast Air Quality Management District and Southern California Association of Governments in their efforts to implement the regional Air Quality Management Plan.

Goal 7: Reduce greenhouse gas emissions from activities occurring in Rancho Santa Margarita to levels consistent with State goals.

Policy 7.1: Pursue funding sources to develop and implement programs and projects that reduce greenhouse gas emissions produced within the City.

Policy 7.2: Proactively inform and educate residents, business-owners, and developers regarding techniques for sustainable development and resource conservation.



Mitigation Measures:

GHG-1: Within 24 months of adoption of the proposed General Plan, the City of Rancho Santa Margarita shall implement an Energy Action Plan (EAP). The EAP shall:

- Evaluate the City's current green building requirements every three years, consistent with Building Code updates, to consider additional requirements for new residential and nonresidential development to ensure that new development meets or exceeds adopted green building measures in the state.
- Establish a program to encourage and incentivize existing development to install solar panels.
- Encourage the use of electric equipment for City construction contracts.
- When feasible, the City shall offer incentives for use of energy reduction measures such as expedited permit processing and reduced fees.
- Coordinate periodic community outreach to leverage community involvement, interest, and perspectives in implementing energy reduction measures.
- Review and evaluate the availability of renewable energy sources for consumers within Rancho Santa Margarita.
- Encourage the business community to reduce energy consumption through innovative technologies such as the use of cogeneration facilities.
- Work with large employers and retail shopping centers to ensure access to EV charging stations.

In addition, to implement the EAP, the City shall appoint an Implementation Coordinator to oversee the successful implementation of all selected EAP strategies. The primary function of the Implementation Coordinator will be to create a streamlined approach to manage implementation of the EAP.

Level of Significance: Significant and Unavoidable Impact.



CONSISTENCY WITH APPLICABLE GHG PLANS, POLICIES OR REGULATIONS

- **IMPLEMENTATION OF THE GENERAL PLAN UPDATE WOULD NOT CONFLICT WITH AN APPLICABLE PLAN, POLICY, OR REGULATION ADOPTED FOR THE PURPOSE OF REDUCING THE EMISSIONS OF GREENHOUSE GASES.**

Impact Analysis:

CONSISTENCY WITH THE CARB SCOPING PLAN

The goal to reduce GHG emissions to 1990 levels by 2020 (Executive Order S-3-05) was codified by the Legislature as the 2006 Global Warming Solutions Act (AB 32). In 2008, CARB approved a Scoping Plan as required by AB 32. The Scoping Plan has a range of GHG reduction actions which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program. The 2017 Scoping Plan Update identifies additional GHG reduction measures necessary to achieve the 2030 target. These measures build upon those identified in the First Update to the Scoping Plan (2013). [Table 5.7-3, General Plan Update Consistency with the 2017 Scoping Plan](#), evaluates the project's consistency with the 2017 Scoping Plan to determine whether it will result in adverse cumulative impacts to global climate change.

As shown in [Table 5.7-3](#) the General Plan Update would not conflict with the implementation of the 2017 Scoping Plan. Many of the programs are not applicable at a General Plan level, such as developing low carbon fuel standards and the cap and trade program, however some programs are applicable and supported by the General Plan Update. General Plan Update goals and policies that support the implementation of the Scoping Plan would improve air quality, reduce GHG emissions, encourage alternative modes of transportation, such as walking, biking, and public transportation, and divert waste from landfills. Overall, General Plan Update impacts related to consistency with the 2017 Scoping Plan would be less than significant.

**Table 5.7-3
General Plan Update Consistency with the 2017 Scoping Plan**

Programs and Policies	Primary Objective	Consistency
SB 350	Reduce GHG emissions in the electricity sector through the implementation of the 50 percent Renewables Portfolio Standard, doubling of energy savings, and other actions as appropriate to achieve GHG emissions reductions planning targets in the Integrated Resource Plan process.	Not Applicable. SB 350 requires that 50 percent of the energy Southern California Edison provides to Rancho Santa Margarita is from renewable sources and is required by law to submit an Integrated Resource Plan which includes a Renewable Portfolio Standard of 50 percent by 2030.
Low Carbon Fuel Standard	Transition to cleaner/less-polluting fuels that have a lower carbon footprint.	Not Applicable. This Statewide policy establishes carbon reduction standards for transportation fuels and does not directly apply to the General Plan Update.



**Table 5.7-3 [continued]
General Plan Update Consistency with the 2017 Scoping Plan**

Programs and Policies	Primary Objective	Consistency
Mobile Source Strategy (Cleaner Technology and Fuels)	Reduce GHGs and other pollutants from the transportation sector through transition to zero-emission and low-emission vehicles, cleaner transit systems and reduction of vehicle miles traveled.	Consistent. The General Plan Update includes policies that encourage the reduction of GHG emission through low-emission vehicles, cleaner transit, and reduction of vehicle miles traveled. For example, Conservation/Open Space Element Policy 4.2 promotes land use patterns that reduce the number and length of vehicle trips; Policy 4.3 encourages the expansion and retention of local serving retail businesses to reduce vehicle trips and length of trips; and Policy 4.4 promotes complete streets improvements and alternative modes of transportation, such as walking, biking, and public transportation to reduce emissions associated with automobile use.
SB 1383	Approve and Implement Short-Lived Climate Pollutants strategy to reduce highly potent GHGs.	Consistent. This policy addresses methane emissions generated from landfill disposal of organic waste. Land Use Element Policy 7.2 promotes the participation in local and regional programs that encourage the per capita reduction of solid waste in the City to meet State mandates for waste reduction. Additionally, Municipal Code Section 5.06.280, <i>Permittee Diversion Requirements</i> , requires solid waste permittees to divert a minimum of 60 percent of solid waste collected within the City each calendar year. Failure to meet the diversion requirement is grounds to deny issuance of, suspend, and/or revoke a solid waste collection permit. As such, the General Plan Update and existing Municipal Code requirements would ensure the project does not conflict with SB 1383.
California Sustainable Freight Action Plan	Improve freight efficiency, transition to zero emission technologies, and increase competitiveness of California's freight system.	Not Applicable. This policy addresses goods movement efficiencies that are not affected by the General Plan Update.
Post-2020 Cap and Trade Program	Reduce GHGs across largest GHG emissions sources	Not Applicable. This program involves capping emissions from electricity generation and industrial facilities. The General Plan Update does not include industrial land uses.

Source: California Air Resources Board, California's 2017 Climate Change Scoping Plan, November 2017.

CONSISTENCY WITH THE 2016-2040 RTP/SCS

The 2016-2040 RTP/SCS is expected to help California reach its GHG reduction goals, with reductions in per capita transportation emissions of nine percent by 2020 and 16 percent by 2035.²¹ Furthermore, although there are no per capita GHG emission reduction targets for passenger vehicles set by CARB for 2040, the 2016-2040 RTP/SCS GHG emission reduction trajectory shows that more aggressive GHG emission reductions are projected for 2040.²² The 2016-2040 RTP/SCS would result in an estimated eight-percent decrease in per capita passenger vehicle GHG emissions by 2020, 18-percent decrease in per capita

21 California Air Resources Board, Regional Greenhouse Gas Emission Reduction Targets Pursuant to SB 375, Resolution 10-31.

22 Southern California Association of Governments, *2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy*, April 2016.



passenger vehicle GHG emissions by 2035, and 21-percent decrease in per capita passenger vehicle GHG emissions by 2040. By meeting and exceeding the SB 375 targets for 2020 and 2035, as well as achieving an approximately 21-percent decrease in per capita passenger vehicle GHG emissions by 2040 (an additional three-percent reduction in the five years between 2035 [18 percent] and 2040 [21 percent]), the 2016-2040 RTP/SCS will fulfill and exceed its portion of SB 375 compliance with respect to meeting the State's GHG emission reduction goals.

At the regional level, the 2016-2040 RTP/SCS is an applicable plan adopted for the purpose of reducing GHGs. In order to assess the project's potential to conflict with the 2016-2040 RTP/SCS, this section also analyzes the project's land use assumptions for consistency with those utilized by SCAG in its SCS. Generally, projects are considered consistent with the provisions and general policies of applicable City and regional land use plans and regulations, such as SCAG's RTP/SCS, if they are compatible with the general intent of the plans and would not preclude the attainment of their primary goals. Table 5.7-4, Consistency with the 2016-2040 RTP/SCS, demonstrates the General Plan Update's consistency with the actions and strategies set forth in the 2016-2040 RTP/SCS.²³

As depicted in Table 5.7-4, the project would be consistent with the 2016-2040 RTP/SCS through various polices. The General Plan Update policies would support development that is encouraged by the RTP/SCS to reduce VMT and expand multi-modal transportation options in order for the region to achieve GHG reductions from the land use and transportation sectors required by SB 375, which, in turn, advances the State's long-term climate policies.²⁴ By furthering implementation of SB 375, the General Plan Update supports regional land use and transportation GHG reductions consistent with State regulatory requirements. Therefore, the project would be consistent with the GHG reduction-related actions and strategies contained in the 2016-2040 RTP/SCS.

CONCLUSION

As shown in Table 5.7-2, the project's long-term GHG emissions would exceed the 3.3 MTCO₂eq per year per person efficiency standard and would result in a significant and unavoidable impact. However, demonstrated in Table 5.7-3 and Table 5.7-4 and discussed above, the General Plan Update would be consistent with several goals, policies, strategies, programs, and actions in CARB's 2017 Scoping Plan and the SCAG 2016-2040 RTP/SCS. The City would also cooperate with SCAQMD and SCAG in their efforts to implement the regional AQMP. Therefore, the General Plan Update would not conflict with applicable GHG reduction plans, polices, or regulations and a less than significant impact would occur.

23 As discussed in the 2016-2040 RTP/SCS, the actions and strategies included in the 2016-2040 RTP/SCS remain unchanged from those adopted in the 2012-2035 RTP/SCS.

24 As discussed above, SB 375 legislation links regional planning for housing and transportation with the GHG reduction goals outlined in AB 32.



**Table 5.7-4
Consistency with the 2016-2040 RTP/SCS**

Actions and Strategies	Responsible Party(ies)	Project Consistency Analysis
Land Use Strategies		
Focus new growth around transit.	Local jurisdictions	Consistent. The General Plan Update includes a number of policies related to focusing new growth around transit. Specifically, Conservation/Open-Space Element Policy 4.4 encourages complete streets improvements and alternative modes of transportation, such as walking, biking, and public transportation to reduce emissions associated with automobile use. Land Use Element Policy 4.5 supports transit, bicycle, and pedestrian improvements that connect within the City and Policy 4.6 encourages nodes of interest and activity, public open spaces, well-planned development, mixed-use projects, and signature commercial uses that are highly accessible by pedestrians, bicyclists, and transit users.
Provide more options for short trips through Neighborhood Mobility Areas and Complete Communities.	SCAG, Local jurisdictions	Consistent. SCAG's Complete Communities strategy supports households with a range of mobility options to complete short trips so that daily needs can be met within a short distance of home, and SCAG's Neighborhood Mobility Areas strategy encourages the use of Neighborhood Electric Vehicles. The General Plan Update would support these strategies by introducing a new Mixed-Use land use designation intended to encourage more flexible, compact, and diverse uses. Optimal future mixed-use areas of the City would have close proximity to major employment areas, be located near the City center or existing commercial centers with enough surrounding density to support retail and promote walkability. Further, Conservation/Open Space Element Policy 4.2 promotes land use patterns that reduce the number and length of motor vehicle trips; Policy 4.3 encourages the expansion and retention of local serving retail businesses (e.g., restaurants, drug stores) to reduce the number and length of automobile trips to comparable services located in other jurisdictions; Policy 4.4 encourages complete streets improvements and alternative modes of transportation; and Policy 4.5 encourages the City to consider vehicle miles traveled when creating and implementing planning documents and reviewing development proposals.
Support local sustainability planning, including developing sustainable planning and design policies, sustainable zoning codes, and Climate Action Plans.	Local jurisdictions	Consistent. This strategy calls on local governments to adopt General Plan updates, zoning codes, and Climate Action Plans to further sustainable communities and reduce GHG emissions. The proposed Conservation/Open Space Element includes goals and policies related to air quality, energy conservation, and greenhouse gas emissions that would promote sustainable planning and design. For example, Policy 5.1 encourages the City to participate in local, regional, and State programs that promote energy conservation and alternative energy sources; Policy 5.2 promotes collaboration with energy suppliers and distributors to institute energy conservation programs and inform the public of these programs; and Policy 5.3 encourages green design features such as passive solar design, natural ventilation, and building orientation during the development review process.
Technological Innovation and 21st Century Transportation		
Promote zero-emissions vehicles.	SCAG, Local jurisdictions	Consistent. As previously discussed, the General Plan Update would promote zero emission vehicles by implementing Conservation/Open Space Element Policies 5.1 through 5.3, which encourage energy conservation through local, regional and State programs; collaboration with energy suppliers and distributors; and increases in green design features for future development projects.
Promote neighborhood electric vehicles.	SCAG, Local jurisdictions	Consistent. SCAG's Neighborhood Electric Vehicles strategy reflects State and local policies to encourage the use of alternate modes of transportation for short trips. As previously discussed, the General Plan Update would promote a pattern of land use development that encourages shorter and fewer trips.
Source: Southern California Association of Governments, 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy, April 2016.		



Proposed General Plan Update Policies and Actions:

CONSERVATION/OPEN SPACE ELEMENT

Goal 4: Cooperate with local and regional agencies to improve air quality.

- Policy 4.2:** Promote land use patterns that reduce the number and length of motor vehicle trips.
- Policy 4.3:** Encourage the expansion and retention of local serving retail businesses (e.g., restaurants, drug stores) to reduce the number and length of automobile trips to comparable services located in other jurisdictions.
- Policy 4.4:** Encourage complete streets improvements and alternative modes of transportation, such as walking, biking, and public transportation to reduce emissions associated with automobile use.
- Policy 4.5:** Consider vehicle miles traveled when creating and implementing planning documents and reviewing development proposals.

Goal 5: Encourage energy conservation.

- Policy 5.1:** Participate in local, regional, and state programs that promote energy conservation and alternative energy sources.
- Policy 5.2:** Collaborate with energy suppliers and distributors to institute energy conservation programs, and inform the public of these programs.
- Policy 5.3:** Encourage green design features such as passive solar design, natural ventilation, and building orientation during the development review process.

Goal 7: Reduce greenhouse gas emissions from activities occurring in Rancho Santa Margarita to levels consistent with State goals.

- Policy 7.1:** Pursue funding sources to develop and implement programs and projects that reduce greenhouse gas emissions produced within the City.
- Policy 7.2:** Proactively inform and educate residents, business-owners, and developers regarding techniques for sustainable development and resource conservation.

LAND USE ELEMENT

Goal 4: Integrate transportation and land use planning to provide mobility options and comfort for pedestrians, bicyclists, transit users, and personal vehicles.

- Policy 4.5:** Support transit, bicycle, and pedestrian improvements that connect within the City and to neighboring jurisdictions.



Policy 4.6: Encourage nodes of interest and activity, public open spaces, well-planned development, mixed-use projects, and signature commercial uses that are highly accessible by pedestrians, bicyclists, and transit users.

Goal 7: Ensure that local providers of solid waste collection and disposal provide sufficient, cost-effective recycling and solid waste disposal services.

Policy 7.2: Participate in local and regional programs that encourage the per capita reduction of solid waste in Rancho Santa Margarita in order to meet State mandates for waste reduction.

Mitigation Measures: No mitigation is required.

Level of Significance: Less Than Significant Impact.

5.7.6 CUMULATIVE IMPACTS

- **GREENHOUSE GAS EMISSIONS RESULTING FROM DEVELOPMENT ASSOCIATED WITH IMPLEMENTATION OF THE GENERAL PLAN UPDATE AND CUMULATIVE DEVELOPMENT COULD IMPACT GREENHOUSE GAS EMISSIONS ON A CUMULATIVELY CONSIDERABLE BASIS.**

Impact Analysis: The topic of GHG emissions is inherently a cumulative impact. Though significance thresholds can be developed by air districts, as well as State and Federal regulatory agencies, these thresholds and their related goals are ultimately designed to effect change at a global level. Table 5.7-2 states that implementation of the General Plan Update would generate approximately 334,480 MTCO₂e of GHG emissions by 2040, approximately 57,440 MTCO₂e less than existing conditions. The 2040 GHG emissions per service population is 6.5 MTCO₂e per service population, which is above the SCAQMD's efficiency standard threshold of 3.3 MTCO₂e per service population and would result in a significant and unavoidable impact. Although the General Plan Update is consistent with the 2017 Scoping Plan and the 2016-2040 RTP/SCS and would not prevent California from achieving its GHG emission goals, the General Plan Update would result in a significant cumulative and unavoidable impact even with the implementation of mitigation.

Proposed General Plan Update Policies and Actions: Refer to the General Plan Update goals and policies cited above.

Mitigation Measures: Refer to Mitigation Measure GHG-1.

Level of Significance: Significant Unavoidable Impact.



5.7.7 SIGNIFICANT UNAVOIDABLE IMPACTS

Implementation of the General Plan Update would result in significant unavoidable GHG impacts. If the City approves the proposed General Plan Update, the City will be required to make findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations for consideration by the City's decisionmakers in accordance with Section 15093 of CEQA.

5.7.8 SOURCES CITED

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